ORIGINAL ARTICLE

Quality of Life and Its Association With Psychological Status Among Work-from-home Parents During the Covid 19 Pandemic

Imann Dalila Mohd Zamberi[1], Mohd Yusmaidie Aziz[2], Siti Aisyah Mualif[3], Muhammad Yusran Abdul Aziz[4], Seri Mirianti Ishar[5], Noor Asyikin Suaidi[6], Siti Nurshahida Nazli[7], Ahmad Razali Ishak[1]

[1] Centre of Environmental Health and Safety, Faculty of Health Sciences, Universiti Teknologi MARA Selangor, Malaysia
[2] Integrative Medicine Cluster, Advanced Medical and Dental Institute, Universiti Sains Malaysia, 13200 Bertam, Kepala Batas, Penang, Malaysia
[3] School of Biomedical Engineering and Health Sciences, Faculty of Engineering, Universiti Teknologi Malaysia, 81310 Johor Bahru, Malaysia
[4] Pusat Asasi Sains dan Perubatan (PUSPA), UnisZa, Kampus Gong Badak, 21300, Kuala Nerus, Terengganu.
[5] Forensic Science Program, Faculty of Health Sciences, Universiti Kebangsaan Malaysia, 43600, Bangi Malaysia
[6] Department of Forensic Medicine, Hospital Sungai Buloh, 47000, Sungai Buloh, Malaysia
[7] Faculty of Health Sciences, UiTM Cawangan Pulau Pinang Kampus Bertam, 13200, Kepala Batas, Pulau Pinang

ABSTRACT

Introduction: The pandemic COVID-19 has profoundly disrupted the social and economic activities that lead to the trend of work from home. The aim of this study was to determine the prevalence of depression, anxiety, and stress and their associations with quality of life among parents who work from home during the COVID-19 pandemic in Shah Alam. **Methods:** A total of 384 parents were included in this cross-sectional study through convenience and snowball sampling techniques. An online survey methodology, Google Form, involving Depression, Anxiety, and Stress Screening 21 Item Questionnaire and Short Form 36 Health Survey Questionnaire were utilized to collect the data via WhatsApp, Facebook, and Telegram. Descriptive analysis, binary logistic regression, and Spearman's correlation coefficient were used to analyse the recorded data using SPSS version 26. **Results:** Majority of participants were 40 - 49 years old, female, Malay, married and have three numbers of children. It was found that about 58.3%, 59.1%, and 38.8% of the participants were having depressed, anxious, and stressed, respectively. However, the findings indicated lower mean scores among participants in all SF-36 domains except vitality when compared with the Malaysian norm. Marital status was associated with depression and gender was associated with anxiety. No sociodemographic variable was associated with stress. All domains of SF-36 were negatively associated with depression, anxiety, and stress. **Conclusion:** Higher level of depression, anxiety, and stress reduced the quality of life. Hence, effective interventions for better psychological status and quality of life of parents during a potential subsequent pandemic is necessary.
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Corresponding Author:
Ahmad Razali Ishak (PhD)
Email: ahmadr2772@uitm.edu.my
Tel: +603-32584509

INTRODUCTION

In December 2019, an outbreak of a newly discovered virus was recorded for the first time in Wuhan, Hubei Province, China, and became a pandemic, called Coronavirus Disease 2019 (COVID-19), within the following two months (1). As researchers have limited knowledge of this novel coronavirus, most countries in the world have been recorded to be affected by the COVID-19 pandemic (2). Globally, the pandemic has recorded about 73,702,055 confirmed cases and 1,658,6455 deaths at the time of writing (2). The rapid increase in the COVID-19 cases rate has become a major issue for every government, particularly in Malaysia.

The Malaysian government imposed some intervention for the COVID-19 pandemic to reduce the widespread pandemic including closures of the workplace and educational institutions, stay-at-home orders, and social distancing. These COVID-19 responses caused most companies to temporarily stop their in-person services

and arrange for their employees to work from home through teleworking. The relocation of the workplace during this pandemic has created a challenging environment for the employees, especially parents that have to adapt to a new way of performing their work at home and caring for their child at the same time since the schools also were closed.

Previous studies have indicated the impact of remote working conditions on parents. Some of the working parents may not have ergonomic office furniture for an ideal workplace in their home (3). The absence of that furniture can hinder the adoption of healthy posture. Another study supported the statement by saying it can facilitate the onset of musculoskeletal disorders (4). Employees that have sedentary work for extended periods raise the risk of pain in the neck or low back pain. A survey (5), which involved 436 workers that work from during the COVID-19 pandemic, found that 24% of the participants experienced distraction from other household members.

The parents that work from home might have trouble juggling roles as employer and parent at home. Through this teleworking system, they might experience difficulties in ensuring effective communication and cooperation with other staff and managers (6). Furthermore, parental demand has increased due to the closure of educational institutions and childcare services. Those negative consequences, from altered working conditions, perceived by the working parents may lead to changes in their physical and mental wellbeing. The presence of psychological distress such as depression, anxiety, and stress could hinder their quality of life.

There has been limited research on parents during COVID-19 regarding their depression, anxiety, stress and quality of life. A recent study (7) measured the mental health status of 1163 parents during COVID-19 in China and found that 6.1% and 4.0% of participant were depressed and anxious respectively. The researchers considered the results low since they conducted the study in the late period of the COVID-19 pandemic where the depression and anxiety of the parents may have been relieved. A further study (8) in the United States, found out that the psychological wellbeing of the parent deteriorated during the post-COVID-19 restriction period. Another study (9) in the United States also reported that levels of parent's depression and anxiety were higher during the COVID-19 pandemic. Not only that, the quality of life of parents that work from home was dcrease amidst the pandemic (10). This finding also can be supported by another finding where parents experienced poor sleep during pandemic due to depression and stress felt by them (9).

Several studies have reported on the mental health of parents during COVID-19 pandemic but not in Malaysia particularly parents that work from home. Therefore, the physiological health status of working at home parent with children must be well examined. Hence, this study aims to determine the quality of life and its association with depression, anxiety, and stress among parents that work from home during this global crisis. The result of the research will give essential references about parents' psychological status throughout the COVID-19 pandemic for comparison to data obtained in future research. This research has the potential to produce a more integrated understanding in guiding the development of an intervention for the promotion of the physical and mental wellbeing of parents that work from home.

MATERIALS AND METHODS

Study design and participant

This was a cross-sectional study. It was conducted from 15th February 2021 till 7th March 2021. All parents living in Shah Alam who work from home while caring for their child at their home during time of collection data were included in the study except for those diagnosed with pre-existing psychiatric illness. Shah Alam was selected as the study location due to the availability of a high number of remote employees in the selected areas. The total number of participants involved in this study were 384 parents. The participants were required to answer three sections of questionnaire: participants' demographic, participants' psychological status, and participants' quality of life.

Sample size calculation and sampling method

The determination of sample size was calculated using a sample size calculator by Raosoft, Inc. with 5% margin of error and 95% confidence level. Based on a study (11), 650 000 people were selected as population size to obtain sample size for this study. After considering 50% for response distribution, the recommended sample size for this study was 384 people. The sampling methods adopted for this study were convenience and snowball sampling which both methods fall under non-probability sampling. The link for the questionnaire was blasted through social media tools and the participants were requested to disseminate the questionnaire further among their networks.

Data collection

The Depression, Anxiety and Stress 21 Item Questionnaire Screening (DASS-21) and Short Form 36 Health Survey Questionnaire (SF-36) were used data collection instruments in this study. The questionnaires employed were well-known questionnaires that had been used in previous studies. The data from questionnaires were collected via an online questionnaire tool, Google Form since the face-to-face interview had to be avoided due to the COVID-19 pandemic. The link for questionnaires was distributed to parents through social media tools such as WhatsApp, Facebook, and Telegram for three

weeks. The questionnaires were set up so that only one response for each participant. There was no honorarium given to the respondents and the responses were anonymous.

Study instruments

The questionnaire was divided into three sections with a total of 61 questions. The total estimated time for the participant to complete the questionnaire was approximately 15 minutes. The first section was the sociodemographic characteristics including age, gender, marital status, ethnicity, and the number of children. The second section of the questionnaire was DASS-21, an instrument to measure mental health status of respondents. It assessed three domains; depression, anxiety and stress. The third section was SF-36 that was used to measure the quality of life of respondents. It covers eight domains of health: physical functioning, social functioning, bodily pain, role limitation due to physical health, role limitation due to emotional health, general health, vitality, and mental health.

DASS-21

This questionnaire is a shorter version of DASS-42 and it contains 21 questions that are divided into seven questions for each DASS-21 domain. The depression focused on dysphoria, despair, devaluation of life, low self-esteem, lack of interest and lethargy. Autonomic arousal, skeletal muscle effect, situational anxiety and subjective sensation of anxious affect are assessed on anxiety domain while level of chronic non-specific arousal such as difficulty breathing, nervous arousal, irritable, impatient and easily upset are examined on stress domain. The Malay version of the DASS-21 had been validated and shown to have good psychometric properties for the general Malaysian population (12). The Malay DASS-21 had good reliability coefficients through Cronbach's alpha for all three subscales; 0.863 for depression, 0.850 for anxiety, 0.837 for stress and 0.90 for overall (13). Both English and Malay versions of DASS-21 were used in our survey. The participants were required to rate their experience of psychological distress from the previous week. The response for each question was scored based on a Likert Scale of four: 0 point (never), 1 point (sometimes), 2 point (often), and 3 points (always). The total score for each subscale was calculated by summing the scores of items belonging to each subscale. The results were interpreted in terms of severity level; normal, mild, moderate, severe and extremely severe.

SF-36

A self-reported measure that is made up of 36 items that can be divided into ten items for physical functioning, two items for social functioning, four items for role limitation due to physical health, three items for role limitation due to emotional health, four items for vitality, five items for mental health, two items for bodily pain and five items for general health, Physical functioning measures limitations in daily physical activities resulting from health problem while social functioning measures limitations in social activities caused by physical or emotional problem. Role limitation due to physical health can be interpreted as difficulties with work or daily activities due to physical health problems whereas role limitation due to emotional health can be interpreted as difficulties with work or daily activities due to emotional problems. Vitality is a domain that assesses loss of energy or presence in fatigue. Mental health examines psychological distress experienced by respondents. Bodily pain assesses the severity of bodily pain and how much it interferes with daily activities. General health is perception by respondents toward their overall health. All eight domains were scored on a scale from 0 till 100 with 100 score as the best possible health state. The study population was compared, in terms of quality of life, to a reference group from a previous study (14) which consist a random sample (n=3072), aged 18 to 87 years old, for a representative of the general Malaysian population. The International Quality of Life Assessment Project (IQOLA) had developed a translated Malay version and reported satisfactory internal consistency (15). Both English and Malay versions were available in this study.

Ethical Approval

Ethical approval was obtained from the UiTM research ethics committee (REC/08/2021(MR/703). All participants gave their informed consent, which was included in the online questionnaire, prior to data collection.

Statistical analysis

The obtained data were analyzed using Statistical Package for the Social Science (SPSS) software version 26. The mean and standard deviation were calculated for participant's sociodemographic, DASS-21 score and SF-36 score. Cross tabulation was conducted to compare the distribution percentage of depression, anxiety, stress in terms of parents' sociodemographic variables. The binary logistic regression was performed to determine the association between sociodemographic variables and depression, anxiety, and stress with statistical significance at p-value <0.05. The correlation between level of depression, anxiety, and stress toward the domain of quality of life were determined through Spearman's correlation test. It was performed with a significance level of $p < 0.01$ and all p-values were two-tailed.

RESULT

Sociodemographic result of participants

Table I illustrates the sociodemographic attributes of participants. The 384 parents included in the analysis were made up of 258 (67.2%) females and 126 (32.8%) males. Among the 384 participants, 33.3% were in the age group of 40-49 years. The majority of survey

Table I: Sociodemographic characteristic of participant (N=384)

Variable (unit)	N	%
Age (years)		
20 - 29	89	23.2
30 - 39	117	30.5
40 - 49	128	33.3
50 - 59	38	9.9
>60	12	3.1
Gender		
Female	258	67.2
Male	126	32.8
Ethnicity		
Malay	281	73.2
Chinese	56	14.6
Indian	29	7.6
Other	18	4.7
Marital status		
Married	300	78.1
Divorced	50	13.0
Widowed	34	8.9
Number of children		
1	34	8.9
2	60	15.6
3	98	25.5
4	53	23.8
5	88	22.9
>6	51	13.3

participants are Malay people (73.2%) followed by Chinese (14.6%), Indian (7.6%), and other ethnicities (4.7%). Almost three-quarters of parents involved in this study are married people (78.1%) with only 13% as divorced people and 8.9% as widowed people. The greatest number of children had by the participants were 3 children (25.5%).

Impact of work from home during pandemic on depression, anxiety, stress and quality of life among parents

Based on table II, the general median for depression, anxiety and stress were 2.10 (SD =1.12), 2.32 (SD=1.30), and 1.61 (SD=0.91) respectively. The severity rating level of depression and anxiety indicated that most of the participants experience depression and anxiety, ranging from mild to extremely severe, during the period of study. The result demonstrated that 58.3 % and 59.1 % of participants were depressed and anxious respectively, while others had the normal score for both DASS-21 subscales. However, most participants (61.2 %) experienced normal types of stress.

Table II: Descriptive statistic for DASS-21 questionnaires

	n	%	Median	SD
DASS-21				
Depression			2.10	1.12
Normal	160	41.7		
Mild	75	19.5		
Moderate	113	29.5		
Severe	22	5.7		
Extremely severe	14	3.6		
Anxiety			2.32	1.30
Normal	157	40.9		
Mild	41	10.7		
Moderate	124	32.3		
Severe	30	7.8		
Extremely severe	32	8.3		
Stress			1.61	0.91
Normal	235	61.2		
Mild	89	23.2		
Moderate	36	9.4		
Severe	22	5.7		
Extremely severe	2	0.5		

For the SF-36 subscale, the mean for each eight domain were 76.19 (SD=21.53) for physical functioning, 40.30 (SD=41.77) for bodily pain, 37.15 (SD=40.98) for role limitation due to the physical health problem, 38.91 (SD=20.48) for role limitation due to personal or emotional problem, 52.28 (SD=18.48) for mental health, 70.54 (SD=19.56) for social functioning, 68.31 (SD=20.82) for vitality and 41.17 (SD=27.30) for general health as summarized in table 4.3. The lower general mean score for bodily pain (40.3%), role limitation due to physical health (37.15%) and personal or emotional problem (38.91%), mental health (52.28%), and general health (39.23%) suggested the majority of the participants were suffered from bodily pain, limited their task due to physical or emotional issue, degraded mental health and lower general health during the pandemic.

There were comparisons between study population and general population (14) in reference to their SF-36 score. The mean SF-36 score for parents that work from home was significantly lower than the general Malaysian population for bodily pain, role limitation due to physical

Table III: SF-36 score of study sample compared with general Malaysian population

SF-36 domains	This study (n=384)		General population (n=3072)		Mean difference
	Mean ± SD	Range	Mean ± SD	Range	
Physical Functioning (PF)	76.19± 21.53	100.00	85.98± 17.91	100.00	-9.79
Bodily Pain (BP)	40.30± 41.77	100.00	69.96± 17.59	90.00	-29.66
Role-Physical (RP)	37.15± 40.98	100.00	82.03± 32.12	100.00	-44.88
Role-emotional (RE)	38.91± 20.48	85.00	79.23± 35.92	100.00	-40.32
Mental Health (MH)	52.28± 18.48	84.00	74.66± 17.19	100.00	-22.38
Social Functioning (SF)	70.54± 19.56	100.00	83.73± 19.28	100.00	-13.19
Vitality (VT)	68.31± 20.82	100.00	66.79± 17.68	100.00	1.52
General Health (GH)	41.17± 27.30	55.00	66.74± 19.99	100.00	-25.57

problems, role limitation due to emotional problems, mental health, social functioning, and general health (table III). However, the score for vitality was consistent with general population norms.

Relationship between sociodemographic variables and depression, anxiety and stress

Scores obtained from three subscales of DASS-21 were dichotomized. Each subscale score falling under mild, moderate, severe, and extremely severe were considered depressed, anxious, or stressed while those in the normal category were said not to experience those psychological impacts. Three new variables were created by grouping participants by age into four groups (20-29 years old, 30-39 years old, 40-49 years old, and above 50 years old),

Table IV: Percentage distribution of participant's psychological status by their sociodemographic variable

Sociodemographic	Depression		Anxiety		Stress	
	Yes	No	Yes	No	Yes	No
	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)
Age						
20 - 29	56 (62.9)	33 (37.1)	53 (59.6)	36 (40.4)	29 (32.6)	60 (67.4)
30 - 39	71 (60.7)	46 (39.3)	74 (63.2)	43 (36.8)	57 (48.7)	60 (51.3)
40 - 49	71 (55.5)	57 (44.5)	69 (53.9)	59 (46.1)	44 (34.4)	84 (65.6)
>50	26 (52.0)	24 (44.5)	31 (62.0)	19 (38.0)	19 (38.0)	31 (62.0)

CONTINUE

Table IV: Percentage distribution of participant's psychological status by their sociodemographic variable (CONT.)

Sociodemographic	Depression		Anxiety		Stress	
	Yes	No	Yes	No	Yes	No
	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)
Gender						
Female	158 (61.2)	100 (38.8)	163 (63.2)	95 (36.8)	108 (41.9)	150 (58.1)
Male	66 (52.4)	60 (47.6)	64 (50.8)	62 (49.2)	41 (32.5)	85 (67.5)
Ethnicity						
Malay	166 (59.1)	115 (40.9)	168 (59.8)	113 (40.2)	109 (38.3)	172 (61.2)
Non-Malay	58 (56.3)	45 (43.7)	59 (57.3)	44 (42.7)	40 (38.8)	63 (61.2)
Marital status						
Married	169 (56.3)	131 (43.7)	177 (59.0)	123 (41.0)	114 (38.0)	186 (62.0)
Divorced	38 (76.0)	12 (24.0)	32 (64.0)	18 (36.0)	25 (50.0)	25 (50.0)
Widowed	17 (50.0)	17 (50.0)	18 (52.9)	16 (47.1)	10 (29.4)	24 (70.6)
Number of children						
1-2	60 (63.8)	34 (36.2)	60 (63.8)	34 (36.2)	41 (43.6)	53 (56.4)
3-5	138 (57.7)	101 (42.3)	142 (59.4)	97 (40.6)	88 (36.8)	151 (63.2)
>6	26 (51.0)	25 (49.0)	25 (49.0)	26 (51.0)	20 (39.2)	31 (60.8)

ethnicity into two groups (Malay and non-Malay), and the number of children into three groups (1-2 children, 3-5 children and above 6 children). Table IV shows the percentage distribution of depression, anxiety, and stress according to each sociodemographic variable.

Binary logistic regressions were conducted to determine the sociodemographic variable associated with depression, anxiety, and stress. The result of the regression, presented in table V, indicated only marital status (p=0.015) was associated with depression; and only gender (p=0.032) was associated with anxiety. No sociodemographic variable was observed to be associated with stress. There were no significant differences in terms of age, ethnicity, and number of children with depression, anxiety, and stress. Nonetheless, we found that those who were divorced (OR= 2.40; 95% CI: 1.185-4.863) were likely to be 2.4 times more depressed than those married people. According to the survey data, females (OR= 1.61; 95% CI: 1.041-2.479) were likely 1.6 times to be anxious compared with males.

Table V: Association between sociodemographic variables and psychological impact during the pandemic (n=384)

Variable	Depression			Anxiety			Stress		
	p-value	OR	95% CI	p-value	OR	95% CI	p-value	OR	95% CI
Age									
20 - 29	0.489	1.31	0.610-2.815	0.382	0.71	0.327-1.535	0.218	0.608	0.276-1.342
30 - 39	0.342	1.39	0.703-2.762	0.973	1.01	0.503-2.039	0.219	1.545	0.772-3.091
40 - 49	0.849	1.07	0.543-2.102	0.263	0.67	0.338-1.344	0.552	0.809	0.402-1.628
>50		1.00			1.00			1.00	
Gender									
Female	0.086	1.47	0.947-2.281	0.032	1.61*	1.041-2.479	0.112	1.45	0.917-2.291
Male		1.00			1.00			1.00	
Ethnicity									
Malay	0.639	1.13	0.685-1.850	0.278	1.32	0.800-2.171	0.609	1.14	0.687-1.899
Non-Malay		1.00			1.00			1.00	
Marital status									
Married		1.00			1.00			1.00	
Divorced	0.015	2.40*	1.185-4.863	0.579	1.20	0.629-2.292	0.092	1.72	0.916-3.232
Widowed	0.548	0.800	0.387-1.654	0.467	0.76	0.366-1.585	0.299	0.66	0.294-2.456
Number of children									
1-2	0.353	1.46	0.659-3.210	0.069	2.08	0.943-4.597	0.346	1.47	0.661-3.261
3-5	0.556	1.21	0.640-2.291	0.157	1.57	0.838-3.001	0.739	0.90	0.466-1.719
>6		1.00			1.00			1.00	

OR= Odd Ratio
CI = Confidence Interval
*Statistically significant at p-value <0.05

Correlation of depression, anxiety and stress with quality of life

A Spearman's correlation was run to determine the relationship between the DASS-21 subscale and domain in SF-36. The results revealed all domains of SF-36 were observed to be significantly negatively correlated with depression, anxiety, and stress (table VI) meaning the lower quality of life was significantly related to higher scores on depression, anxiety, and stress. Strong negative correlations with depression were identified in role limitation due to physical problem (rs=-0.681, p<0.001) and emotional problem (rs=-0.720, p<0.001), mental health (rs=-0.764, p<0.001), social functioning (rs=-0.660, p<0.001) and bodily pain (rs=-0.648, p<0.001). Other domains, physical functioning (rs=-0.524, p<0.001); vitality (rs=-0.588, p<0.001); and general health (rs=-0.590, p<0.001), were moderate negative correlation with depression.

Role limitation due to emotional problems (rs=-0.626, p<0.001), and bodily pain (rs=-0.677, p<0.001) were pointed out to have a strong negative correlation with anxiety while other domains were a moderate negative correlation with it. Also, two strong negative correlations were identified between stress and role limitation due to emotional problems (rs=-0.631 p<0.001); and social functioning (rs=-0.601, p<0.001). The correlation between stress and physical functioning (rs=-0.449, p<0.001), role limitation due to physical problem (rs=-0.573, p<0.001), mental health (rs=-0.561, p<0.001) and bodily pain (rs=-0.562, p<0.001) were moderate negative correlation while weak negative correlations were observed between stress and vitality (rs=-0.390, p<0.001); and stress and general health (rs=-0.387, p<0.001).

Table VI: Spearman's correlation of participant's psychological status with their quality of life

Domain for Quality of Life	Depression		Anxiety		Stress	
	r_s	p-value	r_s	p-value	r_s	p-value
PF	-0.524*	<0.001	-0.535*	<0.001	-0.449*	<0.001
RP	-0.681*	<0.001	-0.573*	<0.001	-0.573*	<0.001
RE	-0.720*	<0.001	-0.626*	<0.001	-0.631*	<0.001
VT	-0.588*	<0.001	-0.545*	<0.001	-0.390*	<0.001
MH	-0.764*	<0.001	-0.583*	<0.001	-0.561*	<0.001
SF	-0.660*	<0.001	-0.589*	<0.001	-0.601*	<0.001
BP	-0.648*	<0.001	-0.677*	<0.001	-0.562*	<0.001
GH	-0.590*	<0.001	-0.502*	<0.001	-0.387*	<0.001

r_s = correlation coefficient
*Correlation is significant at <0.01 (2-tailed)

DISCUSSION

Based on research finding, COVID-19 pandemic has affected the mental health of parents that work from home as more than half of them suffer depression and anxiety while about one-third of them experienced stress. This study showed that 58.3%, 59.1%, and 38.8% of parents that work from home experienced depression, anxiety, and stress, ranging from mild to extremely severe, respectively during the pandemic. The prevalence of depression, anxiety, and stress in the present study were significantly higher than that reported in a previous study (16) which stated that the rate of depression, anxiety, and stress of the general public during COVID-19 were 16.5%, 28.8%, and 8.1% respectively. The prevalence of depression and anxiety found in this study were also higher than healthcare workers during the COVID-19 pandemic (17). The study (17) found that the prevalence of depression and anxiety were 36.5% and 29.5% respectively. Compared to previous studies in China (18), the prevalence rate of depression (58.3% vs 6.1%) and anxiety (59.1% vs 4.0%) among parents were much higher in presence of pandemic. Besides, our findings are in line with several other studies that reported COVID-19 pandemic affected the mental health of the general adult population (19-21).

The local government has implemented several restrictions including the closure of educational institutions and non-essential workplaces, social distancing between persons, and banned large gatherings as response to the COVID-19 pandemic. Thus, people were required to staying indoors most of the time throughout the pandemic. A research (22) reported social isolation contributed to the degradation of mental health as people undergo frustration and boredom. This was also supported by another study (23) that stated a longer period of quarantine during disease outbreak resulting in depression, anxiety, and stress as well as suicide thought and attempts. Higher levels of psychological distress among parents that work from home may be explained by unexpected change in their daily life, especially work-life balance. They needed to remotely work from their house to comply with the government's orders while at the same time educating and caring for their children as well as maintaining household duties. Unclear work-life boundaries might make it difficult for people to mentally disengage from work, which can lead to increase stress and anxiety (24). Therefore, emotional exhaustion might occur from ongoing work-family conflict (24).

Another plausible reason for lower mental health during COVID-19 is COVID-19 information overload. Inconsistent information from several international and local authorities, experts, and scientists of various backgrounds as well as the mainstream media were shared with the public (25). The COVID-19 information is often obtained and updated via social media platforms. People, on the other hand, have been overwhelmed by the amount of COVID-19 information they have received (26) including fake news and this matter might trigger psychological distress. Rumors, misinformation, and fear regarding COVID-19, which easily spread through social media, could exacerbate worry and anxiety among the public (27). A research (28) stated myths and misinformation, which have been worsened by false news reports and the public's misinterpretation of health messages, increasing concern among the public. The finding showed the prevalence of stress was lower than depression and anxiety among the study population. The reason for the lower score of stress outcome was the parent that remotely working during pandemic might adopt higher level coping toward stress, thus potentially causing lower mean score of stress categories. The parents could be coping with perceived stress after living and practicing WFH for almost a year in a pandemic.

Based on the average score of eight domains of quality of life, all domains were recorded lower than 77 score with about 4 domains score less than 50 score: bodily pain (40.30), role limitation due to physical problem (37.15), role limitation due to emotional problem (38.91) and general health (41.72). A higher score, on a scale of 0 to 100, may be interpreted as having a better quality of life. Therefore, the quality of life of parents in this study was generally low during the pandemic. This study corresponds to the previous study (29) which found that parents who had to adjust themselves to shifting their working method to online while also juggling caregiving and household chores, could have led to poorer well-being. A study (30), as opposed to this finding, stated that work from home has been shown to reduce employee turnover while increasing productivity, job engagement, and performance. Thus, those who work from home achieve a better quality of life than those who need to present in the workplace. Recent research (31) also supports the evidence that the quality of life of those working from home has improved as they have flexibility in allocating time throughout the day as well as having more time to devote to certain activities.

The degraded quality of life by parents that work from home might be caused by insufficient rest during working. Employees were found to have difficulty in taking healthy breaks between meetings when consecutive online meetings were held (32). Hence, the increase in musculoskeletal discomfort and other harmful physical health impacts may be connected to intense work at the desk without sufficient breaks (32). According to a recent survey (33), the average length of the workday has extended by 48.5 min, and the number of the meeting per person has increased by 12.9% since the implementation of WFH for the employee. A similar finding (34) was reported where the authors stated time spent during WFH at workstation increased by 1.5 hours when compared to before the pandemic. Thus, physical and mental wellbeing could be affected by this matter

and lead to a decrease in quality of life. The lower score on the quality of life in the present study may be due to the workstation set up at the home during the WFH period. The percentage of the workers had a good workstation set up at their home was only 32.5% (34). Improper setup of the workstation can lead to poor ergonomics during working and it may cause musculoskeletal disorder. Another research (35) discovered 86.3% of 104 workers that work from home during the pandemic experienced musculoskeletal disorder. The musculoskeletal disorder can impair daily work-life routine which causes the quality of life to decrease.

Another finding regarding the quality of health in this study was the average score for domains of quality of life was relatively low in the present study's sample as compared with the general Malaysian population sample except for vitality. This might be due to different periods of study and the condition of the respondent. The study of quality of life involving the general Malaysian population was performed before the COVID-19 pandemic while the present study was conducted amidst the pandemic. Moreover, the respondent for the general Malaysian population undergoes their normal routine during the time of study whereas the respondent for this study experience shifted in daily routine throughout data collection. The reason for vitality was consistent in both studies may be related to fatigue perceived by the respondent. The COVID-19 pandemic has taken place about one year during the time of study and the respondent may have adjusted their fatigue to the situation.

In the present study, there was an association between marital status and depression. The result suggested divorced people had higher scores compared to married people in depression. The relationship between marital status and depression is aligned with prior findings (36) which reported individuals in the divorced category to have a higher mean score in depression than those who were married. Recent evidence (37) supports that divorced people were more likely to be depressed during the COVID-19 outbreak. The higher rate of depression among divorced people compared to the married people might be related to parent's responsibility. The two-parent household can divide childcare and household matters among themselves as reported by a previous study (38) where mothers were responsible for around 62% of childcare while the rest falls on fathers. Thus, extra burdens during WFH can be shared between spouses. However, the divorced parent needs to tend the childcare and household matters by himself or herself. Moreover, due to lockdown, working divorced persons might receive less help from others outside the household such as grandparents, neighbors, friends, and childcare centers, and this matter led to depression among them.

The finding from this research also found that gender was associated with the prevalence of anxiety as females were likely 1.6 times to be anxious compared with males. A recent research (39) evaluating 3324 participants, showed female workers were vulnerable to anxiety than male workers while WFH during the pandemic. Our finding is also in line with several studies that have reported females suffered anxiety greater than males during the COVID-19 outbreak (16,40–41). The study conducted by Zhong et al. (42) reported women to suffer anxiety due to uncertainty in overcoming the COVID-19 pandemic and what chances are of that happening. Furthermore, another study (38) which noted mothers were involved more in childcare and homeschooling during the pandemic. WFH was more difficult for women as they were more responsible for household chores and working mothers may have twice the pressure at home because of lack of support toward childcare and homeschooling (43). This inequality of childcare duties may trigger the increase of anxiety among female parents as they deal with work burdens along with household burdens in their daily life during the pandemic.

Regarding the level of stress, we found no significant difference in terms of age, gender, ethnicity, marital status, and number of children. Therefore, this study suggested the above sociodemographic variable has no association with stress among parents that work from home. However, this finding differs from previous studies which found that gender (44,45) and marital status (44) were associated with stress. Females were reported to experience more stress than males (44,45) and they have a greater chance to develop stress throughout the pandemic (45). According to a research (44), marital status can contribute to stress and found married couple perceived more stress compared to other. The difference in findings might be due to participants of the present study already adopted stress coping as the study was conducted in the late stage of the pandemic.

The finding from the present study suggested the quality of life was significant correlated with depression, anxiety, and stress as all domain of quality of life correlates with psychological impact. A reverse correlation was identified between the quality of life and psychological distress indicating poorer quality of life correlated with the elevated score on depression, anxiety, and stress. A similar study (46) agrees with the finding of the present study by stating depression, anxiety, and stress due to working condition related with poor quality of life. Likewise, a conducted study (47) involving working mothers who work from home, reported parenting stress was associated with their quality of life.

The present study showed that role limitation due to emotional problems have a strong correlation with those three psychological distresses, thereby suggesting the increase of depression, anxiety and stress resulting in actions of the respondent in their daily life was more

limited. A previous study (48) reported remote working employees suffered irritability and negative emotion. Parents who are depressed, anxious, or stressed may be influenced by their psychological distress and affected their daily routine. Hence, unstable emotion experienced by parents restrained their role as workers or parents in their house and decrease their quality of life.

The present research also pointed out a strong correlation between bodily pain toward depression and anxiety. Parents who work from home might not be able to practice an active lifestyle as they could be governed by their depression and anxiety. Past study (49) reported the quality of life in Chinese adults worsened during the pandemic and linked their findings with the decrease in physical activity and prolonged sedentary lifestyle. The psychological distress experienced by parents may facilitate a sedentary lifestyle and causing them to suffer pain. Moreover, the depressed and anxious parents may have limited time to think about their arrangement of work from home setting. The improper setting of the workplace at home might cause an ergonomic issue for the parents and lead to bodily pain felt by them. A study (50) found that poor workstations, such as nonadjustable chairs without armrest, low monitor height, and hard desk surface, among home office-based workers, potentially experience discomfort.

Social functioning was also identified in this study to have a strong correlation with stress which means a higher level of stress can affect the social functioning among parents that work from home during the COVID-19 outbreak. During the implementation of social distancing by the government during the COVID-19 pandemic, all social activities involving gathering between family from the not same household, friends, co-workers, or public were not allowed to avoid the spread of COVID-19 disease. Thus, parents may perceive additional stress compared to before the pandemic situation and unable to perform their normal social functioning. It seems that lower social functioning and a greater level of stress of parents work from home were related to this point.

CONCLUSION

Parents who work from home during COVID-19 experienced varied psychological distress; these include depression, anxiety, and stress. Among them, divorced parents were more likely to depress than married person and females were likely to be anxious than males. From this study, it was revealed that more than half of the parent who were working from home experienced higher level of depression, anxiety, and stress during COVID-19 outbreak had reduced their quality of life. Hence, effective intervention that focused on mental health need to be implemented as it would help to enhance psychological status and quality of life among these parents during a potential subsequent pandemic.

The governmental bodies such as the Ministry of Human Resource and Social Security Organization (SOCSO) can prepare work from home guidelines for the companies to adopt it in their work culture. The goal of decreasing psychological distress among remote working parents is expected to be formally incorporated into the company's work culture, followed by application of various employee benefits during pandemic such as flexible working schedule, online wellness program and counselling support that meet different needs of parents as a form of mental health support and enhancement of quality of life. The findings suggest support provided for remote working mothers or divorce parents should not only focus on emotional support but also equipping them with parent training that includes problem-focused coping strategies.

The current study has several limitations. This research involved cross-sectional research where specific variables were explored at specific moments and led to difficulties in generalizing the results to the whole population. As a result, the data from this research only reflect the psychological status and quality of life of the studied population to a certain extent. Since the convenience and snowball sampling, one of the non-probability sampling methods, were chosen for this research, it may yield a threat such as a challenge in estimating how representative the population is in the sample. Parents with poor internet accessibility or not engaging with social media were likely not included in the study. Thus, selection bias may be created in the studied population and the findings may not be generalized. This study used an online self-reporting questionnaire instead of face-to-face interviews due to health threats during the COVID-19 pandemic. Therefore, individual responses may vary objectively when the supervision from the interviewer is absent.

It is suggested for future research to propose a better study design, such as a longitudinal study together with recruitment of a large sample size, in order to provide more accurate data. A combination of quantitative and qualitative methods will also be meaningful as it can provide an in-depth exploration of the quality of life and its association with psychological status among remote working parents. Despite these limitations, the current findings provide an empirical basis for improvement on governmental policies by policymakers as well as future reference for researchers or public health professionals to guarantee the wellbeing of parents as work from home employees.

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