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Work from home: Indonesian employees' mental well-being and productivity during the COVID-19 pandemic

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Abstract

Purpose – The purpose of this study is to explore to what extent employees' mental well-being affects their productivity while working from home (WFH) during the COVID-19 crisis and whether mental well-being and productivity differ across some socio-demographic factors.

Design/methodology/approach – A cross-sectional study with online questionnaires was designed with 472 valid responses in Indonesia. Depression, Anxiety and Stress Scale (DASS-21) and Individual Work Performance Questionnaire (IWPQ) were administered. Non-parametric tests and structural equation modeling were employed to analyze the data.

Findings – The prevalence of depression was 18.4%, anxiety 46.4% and stress 13.1%, with relatively good productivity. Gender, age, education level, job experiences, marital status, number of children and nature of the organization were associated with the employees' psychological health but not with their productivity, while the workspace availability influenced both outcomes. The study path model showed the negative correlation between WFH employees' psychological well-being and productivity.

Research limitations/implications – This study may contribute to the implication of current mandatory WFH on mental well-being and productivity. Further studies need to address the representativeness and generalizability issues as well as incorporating potential stressors.

Practical implications – Organizations may adopt WFH as a future working arrangement and identify the individual and occupational characteristics that provide the most impacts on productivity. It is also necessary for them to develop proper strategies to mitigate the psychological risks and overcome the WFH challenges.

Originality/value – There is still a lack of studies investigating the relationship between simultaneous effects of WFH on psychological well-being and productivity, and how they affect some socio-demographic variables in the context of COVID-19.

Keywords Mental well-being, Psychological distress, COVID-19, Stress, Work from home, Productivity, Telework

Paper type Research paper

Introduction

The global COVID-19 pandemic has caused severe effects not only on physical health but also on economic and psychological well-being. To prevent the spread of coronavirus while sustaining production, governments worldwide have encouraged organizations to facilitate working from home. Work from home (WFH) – telework, telecommuting, flexible workplace and remote work – is an alternative working arrangement in which employees perform their jobs from home using information and communications technologies (ICTs) to interact with others and complete the working duties (Tavares, 2017). WFH provides advantages,

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including better work–life balance, reduced commuting time, more flexibility, increased perceived autonomy, lower turnover intention, increased job satisfaction, improved productivity and lower occupational stress (Bloom *et al.*, 2015; Gajendran and Harrison, 2007; Nakrošienė *et al.*, 2019; Staples, 2011; Tavares, 2017). On the contrary, it encounters challenges, such as multitasking, social isolation, decreased work motivation, additional cost, distraction and limited communication (Gajendran and Harrison, 2007; Greer and Payne, 2014; Tavares, 2017).

While working remotely has rapidly gained momentum all over the world in the age of technology advances (Greer and Payne, 2014), Indonesia is adopting this work arrangement slowly (Gottlieb *et al.*, 2020; Suarlan, 2017). The concept of WFH itself is still not well-known to most Indonesian organizations due to the limited technology infrastructure, high-context culture, lack of dedicated workspace and tools to complete their job (Mustajab *et al.*, 2020; Suarlan, 2017), as well as distress associated with the need to adapt and cope with new digital technologies (Gaudioso *et al.*, 2017). Indonesians still view that home is where people rest, while work is supposed to be completed at the office (Mustajab *et al.*, 2020; Suarlan, 2017). Although some companies have already offered a WFH option before the government officially enacted the emergency rules on March 31, 2020, the "office habit" remained ingrained in most employees who preferred going to the office only as a formality (Renaldi, 2020).

Due to the pandemic, the current working arrangement has just emerged. Employees face more stressors, not only exaggerated work–life conflict – the schools and daycare facilities closures (Schieman *et al.*, 2020; Vaziri *et al.*, 2020) – but also job insecurity, financial threats and health concerns (Fachriansyah, 2020; Wilson *et al.*, 2020). These may deteriorate the employees' mental health, which in turn plummet their job performance (Crosbie and Moore, 2004; Raišiene *et al.*, 2020).

Despite these crucial facts, literature lacks investigation on the stress affecting productivity in the WFH policy implementation in the context of COVID-19 pandemic. There is a tendency that office-related stress has been shifting toward home-related issues. From the organizational psychology's perspective, studying WFH is one of the most relevant research topics during the pandemic (Kramer and Kramer, 2020; Rudolph *et al.*, 2020). Exploring the employees' mental well-being is of tremendous importance since emotional states can predict the work performance and effective organizational functioning (Burton *et al.*, 2008; Song *et al.*, 2020). Therefore, this study aimed at assessing to what extent employees' psychological well-being affect their work performance during the pandemic. We first assessed the workers' psychological well-being by measuring the depression, anxiety and stress levels, as well as their work performance. Then, we incorporated some socio-demographic information to examine the protective and risk factors.

Theoretical background and hypotheses

Mental well-being among employees during the pandemic

Employees' mental well-being is a crucial determinant in the overall health and has a large impact on the quality of life and productivity (Burton *et al.*, 2008). Psychological distress has been widely used as an indicator of mental well-being, which refers to a state of emotional suffering, accompanied by mild to severe symptoms of depression, anxiety and somatic symptoms (Drapeau *et al.*, 2012). The current unprecedented crisis is a major source of stressors that escalate employees' emotional distress (Charoensukmongkol and Phungsoonthorn, 2020a; Hamouche, 2020). While mental health research has been focused onto high-risk occupational groups such as health professionals (Shaukat *et al.*, 2020; Soto-Rubio *et al.*, 2020), few studies have been conducted among those who were shifting into WFH. The extant literature suggests that WFH owns positive impacts on the psychological health (Bloom *et al.*, 2015; Tavares, 2017). However, the effect of the mandatory and abrupt

implementation of WFH is lack of evidence and unified. In one study, Song *et al.* (2020) revealed that Chinese teleworkers had lower level of stress than working from office after resuming work during the pandemic. Purwanto *et al.* (2020) discovered that Indonesian teachers experienced less distress due to more free available time. On the other hand, Putro and Riyanto (2020) interviewed 27 office workers and found that they suffered more stress during WFH compared with normal working arrangement because of increased family care, household chores and higher workload.

Work from home and employee productivity during the pandemic

The ability to WFH during the pandemic varies across countries. In the USA (Dingel and Neiman, 2020) and European countries (Barrot *et al.*, 2020), it was estimated around 40% of jobs could potentially be performed from home, while in developing countries, it was only around 29.6–31.2%. On a global level, approximately 16.67% of all occupations could be done remotely (ILO, 2020). Despite its potential for widespread working arrangement, its effects on productivity during the COVID-19 crisis present inconsistent results. A survey conducted among Japanese employees revealed decreased worker productivity (Morikawa, 2020), while another survey in the USA showed that the productivity slightly dropped (Afshar, 2020). Some qualitative studies in Indonesian people have shown that WFH during the pandemic was more stressful than the employees' expectation and resulted in the decreased productivity (Mustajab *et al.*, 2020; Putro and Riyanto, 2020). By contrast, other studies stated that Indonesian employees perceived greater job satisfaction and motivation, which enhance job performance during telework (Putra and Riyanto, 2020; Susilo, 2020). In other countries, Danish employees expressed that they completed more work than working on-site (Ipsen *et al.*, 2020); a similar result was also found in a survey among the US hiring managers (Ozimek, 2020).

Socio-demography, mental well-being and productivity during the pandemic

Only few studies explored the impact of current enforced WFH on psychological distress concurrently with productivity-related outcomes. Moretti *et al.* (2020) found that 51 Italian mobile workers reported to be less stressful and equally satisfied compared to working from office, but less productive. Based on the interview with 24 Indian managers, Jaiswal and Arun (2020) discovered an increase in working hours, reduced productivity and higher stress level in these managers. However, no such studies have been conducted in more general WFH occupations with more adequate sample size.

This research had a grounded in a three-factor model of the relationship between stress and productivity, developed by Donald *et al.* (2005), which is generalizable across different groups of employee. The model integrates individual work stressor, stress outcomes (physical and psychological well-being) and employees' productivity. Our proposed model emphasized only the direct effect of the psychological distress on self-rated work performance. Furthermore, when exploring factors associated with mental well-being and productivity in WFH, we identified several potential socio-demographic characteristics that served as protective or risk factors: age, gender, marital status, number of children, education level, job experience, job insecurity and work space availability (Neirotti *et al.*, 2019; Qiu *et al.*, 2020; Song *et al.*, 2020; Xiang *et al.*, 2020).

In terms of gender, generally, women tend to feel more distress during the pandemic across countries (Jahanshahi *et al.*, 2020; Megatsari *et al.*, 2020; Qiu *et al.*, 2020; Rodríguez-Rey *et al.*, 2020; Zhang *et al.*, 2020). Indonesian culture norms have socialized women to prioritize family overwork and be the most responsible ones for domestic chores (Mustajab *et al.*, 2020; Suarlan, 2017), which hinder their effective working abilities. For ages, younger people reported higher levels of distress (Harlianty and Susanti, 2020; Zhang *et al.*, 2020;

Song *et al.*, 2020), although they were not the high-risk group of contracting the disease. Marriage and the number of children should be considered as the factors, due to the possible increase in work–life conflict caused by schools' and daycare closures. Married people tend to have better psychological health, more life satisfaction compared to those who remain single (Caputo and Simon, 2013; Grover and Helliwell, 2019), while parenthood is linked to better subjective well-being (Radó, 2020). Nevertheless, we do not know whether marriage and parenthood become protective or risk factors for mental health and job performance because of an abrupt shift in daily lives during the pandemic.

It is also possible that education level may serve as a protective or risk factor of psychological health. For instance, the nationwide surveys in China (Qiu *et al.*, 2020) and Brazil (Zhang *et al.*, 2020) discovered that people with higher education reported more distress during the pandemic, while recent Indonesian surveys presented the opposite results (Harlianty and Susanti, 2020; Megatsari *et al.*, 2020). The results indicated that length of employment had direct or indirect effects on job performance (Kuo and Ho, 2010). People with more experiences have more opportunities to gain more knowledge and skills, which lead to a higher level of productivity (Schmidt *et al.*, 1986). The nature of organization (state/public institution, private enterprise/social organization/others) is also necessary to be considered concerning the job security issue. Indonesian employees in public sectors are expected to have more job securities because their work environment offers associated privileges and more secure welfare (Saputra, 2018). The COVID-19 pandemic severely affected private enterprise sectors, which left more job insecurities for the employees (Enrico, 2020). Furthermore, the availability of a dedicated workspace factor may also serve as a risk factor. It is anchored to space boundaries, which limits employees productivity because of domestic activities interruption (Gajendran and Harrison, 2007).

In summary, the purpose of this study is to address the previous literature gaps by investigating the relationship between employees distress, job performance and some socio-demographic factors during WFH in the pandemic context. As such, four hypotheses were formulated:

H1. Employees who WFH during the pandemic would experience higher distress levels and lower productivity.

H2. Socio-demographic factors (gender, age, education level, job-experience, marital status, the presence of children, nature of an organization and availability of dedicated workspace) had significant effects on mental-well-being.

H3. The aforementioned socio-demographic factors had significant effects on employees productivity.

H4. There is a negative relationship between mental well-being and productivity among WFH employees during the pandemic.

By answering these hypotheses, we hope not only to contribute to the scientific literature on the implication of WFH during the crisis but also to provide insights for organizations and policy makers to implement strategies to help employees stay mentally healthy and maintain their productivity.

Methods

Participant and procedure

We conducted an online cross-sectional survey from June 24 to July 7 2020, in Indonesia, approximately 2.5 months after the enactment of Large-Scale Social Restrictions (*Pembatasan Sosial Berskala Besar* – PSBB) on March 31, 2020, which include schools and public activities areas closures, public transportation restriction and WFH initiation. Given

the limited time, resources available and time of the crisis, we employed the convenience snowball sampling strategy. The online survey was first disseminated to the authors' networks and social media, and they were encouraged to pass it on to the others. All participants provided their informed consent to participate in the study after being informed about the study's objective, the risks and the benefits of participation. The survey was voluntary and maintained the participants' confidentiality and anonymity of their responses. The inclusion criteria were Indonesian working adults who lived in Indonesia during the pandemic, not infected by the virus and WFH partially or fully. Data about the participants' socio-demographic information, mental well-being and productivity were collected.

Mental well-being measure

Depression, Anxiety and Stress Scale (DASS-21) was employed to measure the respondents' mental well-being (Lovibond and Lovibond, 1996). The three subscales DASS-21 assess symptoms of depression, anxiety and stress, a well-known indicator of mental health. Participants rated the extent of experiencing each symptom over the previous weeks on a four-point Likert scale ranging from 0 (did not apply to me at all) to 3 (applied to me very much, or most of the time). Each sub-scale had seven items. The scores of each subscale were computed by summing the item responses and multiplying them by two (Lovibond and Lovibond, 1996) to make them comparable to the similar studies of COVID-19 (Rodríguez-Rey *et al.*, 2020; Wang *et al.*, 2020). DASS-21 was demonstrated to be a valid measure in assessing the mental health of Indonesian non-clinical population in various research and assessment (Oei *et al.*, 2013; Onie *et al.*, 2020). It has also been administered to capture mental health state during the COVID-19 pandemic in Indonesia (Harlianty and Susanti, 2020) and other countries (Rodríguez-Rey *et al.*, 2020; Wang *et al.*, 2020). The sum scores of depression subscale were categorized as normal (0–9), mild (10–12), moderate (13–20), severe (21–27) and extremely severe (28–42). Sum scores of anxiety subscale were divided into normal (0–6), mild (7–9), moderate (10–14), severe (15–19) and extremely severe (20–42). Sum scores of stress subscale were allocated as normal (0–10), mild (11–18), moderate (19–26), severe (27–34) and extremely severe (35–42).

Productivity measure

Productivity was measured using the Individual Work Performance Questionnaire (IWPQ) (Koopmans *et al.*, 2014); an 18-item scale that comprises of three main dimensions: task performance, contextual performance and counterproductive work behavior (CWB) suitable for various types of jobs. Task performance refers to the individuals' proficiency and ability to perform the core substantive task of the job (Koopmans *et al.*, 2014). Contextual performance is defined as "behavior that contributes to the goals of the organization by contributing to its social and psychological environment" (Rotundo and Sackett, 2002, pp. 67–68). Lastly, CWB is "voluntary behavior that harms the well-being of the organization" (Rotundo and Sackett, 2002, p. 69). IWPQ measures individual productivity on behavior rather than results as the behavior is multidimensional and aligned with organizational goals (Campbell and Wiernik, 2015). The scales have response format on a five-point rating scale (0 = seldom to 4 = always for the task and contextual performance dimension; 0 = never to 4 = often for the CWB). Higher scores reflect higher task or contextual performance, or higher CWB. A mean score for each IWPQ scale was calculated by summing the item scores and dividing their sum by the number of items in the scale. The total IWPQ scores is calculated by the formula: task performance + contextual performance + (4 − CWB). The average total scores ranged from 0 (low) to 12 (high). The IWPQ is cross-culturally adapted and validated with acceptable and good psychometric properties in The Netherlands (Koopmans, 2016), Sweden (Dåderman, 2020), Spain (Ramos-Villagrasa *et al.*, 2019) and Indonesia (Widyastuti and Hidayat, 2018; Ramdani *et al.*, 2019).

Statistical analysis

Descriptive statistics were used to summarize the data. Non-parametric analysis was applied for evaluating the difference across socio-demographic characteristics for each scale of both measures. Confirmatory factor analysis (CFA) was performed to assess the goodness of DASS and IWPQ scales among our sample before analyzing the model by Structural equation modeling (SEM,) as recommended by Kline (2011). We proposed that mental well-being could predict the employees' productivity when worked from home. The model parameters were estimated using diagonal weighted least square (DWLS) because of the ordinal categorical nature and non-normality of both measures (Mîndrilă, 2010). Since the χ^2 statistic is sensitive to sample size, the evaluation of model fit was also examined using various following indices: comparative fit index (CFI), goodness-of-fit index (GFI), root-mean square error of approximation (RMSEA) and standardized root-mean square residual (SRMSR) (Hu and Bentler, 1999; Mîndrilă, 2010). Hu and Bentler (1999) recommended a non-significant χ^2 and values higher than 0.90 for CFI and GFI reflecting an adequate model fit. A value of RMSEA less than 0.06 indicates a good fit, while the values up to 0.08 indicate moderate fit. SRMSR indicates a good fit when its value is < 0.08 and the acceptable fit is < 0.1. SRMSR index is robust to the method used to estimate the model parameter and relative independence from sample size (Nye and Drasgow, 2011). All statistical analyses were run using Statistical Package for the Social Sciences (SPSS) (version 23) and the R package lavaan (Rosseel, 2012) with p-values < 0.05 indicating statistical significance.

Results

Socio-demographic characteristics of sample

A total of 532 questionnaires were collected. After deleting incomplete responses, 472 valid questionnaires with no missing values (88.7% responses rate) were analyzed. In SEM, minimum sample size of 200 or 5–15 cases per indicators are considered adequate (Kline, 2011). The mean age of the respondents was 30.8 years (SD 7.4), and the majority were female (58%). The majority of respondents were married (85%), having 1–3 children (80%) and well-educated (49% $\geq$ bachelor's degree). Regarding occupational characteristics, 59% of respondents worked at private or non-governmental organizations, and 37% had job experiences of 10–20 years. Most of our respondents (68%) reported no dedicated workspace where they could work at home. Table 1 presents the socio-demographic characteristics of respondents.

Table 2 summarizes the descriptive statistics of respondents' DASS and IWPQ scores. The average respondents rated the total scores of IWPQ relatively high ($M = 8.6$, range 0–12). The means of task and contextual performance dimensions presented relatively good scores (2.7 and 2.8 of 4 = excellent, respectively), while the CWB dimension presented the opposite (0.8 of 4 = most deviant behaviors). Most items on DASS-21 and IWPQ had a skewness and kurtosis below |1.0|, and only one item (DASS-21) had a skewness above |2.0| and kurtosis above |4.0|. Mardia's multivariate normality showed significant multivariate skewness and kurtosis values, indicating non-normality distribution ($\chi^2(9{,}880) = 22{,}880.12$).

Correlation and multicollinearity check

Prior to answering H2 and H3, all data were screened by calculating the determinant and observing the R-matrix correlation to investigate the multicollinearity, which could cause difficulties in determining the unique contribution of the variables to a factor (Field, 2005). We found that item number 8 and 9 of IWPQ was very highly correlated ($R = 0.86$), and its respective determinant was below the recommendation 0.00001, indicating multicollinearity. It seems that respondents perceived that the sequence questions (IWPQ8 and IWPQ9) were just the same (IWPQ8 "I worked on keeping my job-related knowledge up-to-date" and

Variable	Category	Frequency	Percentage (%)
Gender	Male	199	42
	Female	273	58
Age	18–35	159	34
	36–55	299	63
	>55	14	3
Marital	Married	403	85
	Divorce	18	3.8
	Not married	51	11
Children	0	64	14
	1–3	376	80
	>3	32	6.8
Education	High school	20	4.2
	Three years college	22	4.7
	Undergraduate	196	42
	Postgraduate	234	49
Nature of organization	State/public organization/institution	195	41
	Private enterprise/others	277	59
Job experience	<5 years	125	27
	5–10 years	138	29
	10–20 years	175	37
	>20 years	34	7.2
Workspace	Yes	153	32
	No	319	68

Note(s): $n = 472$

Table 1.
Socio-demographic characteristics of respondents

Scale	M(SD)	Mdn	IQR	Q1	Q3	Min	Max	Skw	Kurt
DASS									
Total	27.01 (21.67)	23	28	10	38	0	114	1.13	1.29
Depression	7.28 (7.14)	6	8	2	10	0	38	1.38	2.19
Yes *n*(%)	385 (81.6%)								
No *n*(%)	87 (18.4%								
Anxiety	9.25 (7.74)	8	10	4	14	0	40	1.01	1.05
Yes *n*(%)	305 (64.6%)								
No *n*(%)	107 (35.4%)								
Stress	10.50 (8.41)	9	10	4	14	0	38	0.94	0.52
Yes *n*(%)	410 (86.9%)								
No *n*(%)	62 (13.1%)								
IWPQ									
Total	8.6 (1.62)	8.7	2	7.6	9.6	0	12	−0.38	0.78
Task	2.7 (0.73)	2.8	1	3.2	4.2	0	4	−0.36	0.28
Context	2.8 (0.66)	2.9	0.9	3.4	4.3	0	4	−0.55	0.51
CWB	0.9 (0.77)	0.8	1	1.2	2.2	0	4	1.32	2.47

Note(s): M = mean values (standard deviation), Mdn = median. IQR = interquartile range, Q1 = first quartile, Q3 = third quartile, Skw = skewness, Krt = kurtosis. CWB = counterproductive behavior. Yes = moderate to extremely severe, No = normal to mild categories of each DASS

Table 2.
Descriptive statistics of each scale of DASS-21 and IWPQ

IWPQ9 "I worked keeping my work skills up-to-date"), implying response bias. Thus, we decided to drop IWPQ9 and continue analyzing the remaining 17 items. The R-matrix correlation of each item of DASS-21 ranged from 0.22 to 0.70, and no multicollinearity was observed. The association of the DASS-21 and IWPQ scales was assessed with

non-parametric Spearman rho's correlations, which shows significantly medium to strong relationship (Table 3).

Furthermore, to check for a common method bias, the Harman's single-factor test was performed by extracting all indicators in the model into a single factor in the principal factor analysis. The first-factor solution showed 33.89% of the variance falling below the threshold of 50%. Since the value was smaller than the 50% threshold, the method bias did not influence the overall results.

Association among socio-demographic factors, mental well-being (DASS) and productivity (IWPQ)

Before developing our structural model, we evaluated whether any significant differences in mental well-being and productivity across socio-demographic factors existed (H2 and H3), as presented in Tables 4 and 5. Mann–Whitney statistics (U) was conducted to assess the differences between gender and nature of organization groups, while Kruskal–Wallis (χ^2) test was used among other socio-demographic variables.

The anxiety and stress symptoms among female employees were higher than male ones ($p < 0.01$ and $p < 0.05$, respectively), but not the depression symptoms ($p = 0.96$). To evaluate how socio-demographic variables influenced respondents' distress, Dunn–Bonferroni *post hoc* methods were performed following significant Kruskal–Wallis statistics (Table 4). The test showed that younger employees felt more distress than their older counterparts. Those who had a three-year college degree felt more anxious and stressed but not depressive when compared to the lower or higher education levels. Employees who worked in private institutions felt more distress as compared to those of public or state organizations. Respondents who have been working less than five years experienced higher distress than those having longer experiences. Single respondents and those who did not have children were more likely to report less psychological health, as well as respondents who had no dedicated workspaces.

In terms of productivity measure, the significant difference was found on CWB for marital status with those who were divorced or widowed reported the least deviant behaviors. Respondents having no dedicated workspace also stated significantly lower productivity on all three dimensions (task: $p < 0.05$, contextual: $p < 0.001$ and CWB: $p < 0.01$). Other socio-demographic variables, including gender, age, education level, job experience, nature of organization, marital status and parental status, were not correlated with each dimension of IWPQ. Hence, we could not further examine the interrelationship (i.e. moderating effect) onto our model (Memon *et al.*, 2019).

	DASS			IWPQ			
	Depression	Anxiety	Stress	Task	Context	CWB	Cronbach's alpha
DASS							
Depression	1						0.85
Anxiety	0.71*	1					0.84
Stress	0.74*	0.82*	1				0.88
IWPQ							
IWPQ task	−0.30*	−0.19*	−0.20*	1			0.87
IWPQ context	−0.27*	−0.19*	−0.21*	0.67*	1		0.87
IWPQ CWB	0.46*	0.40*	−0.50*	−0.22*	−0.22*	1	0.88

Note(s): *all significant at $p < 0.001$. CWB = counterproductive work behavior

Table 3. Spearman rho's coefficient correlation and Cronbach's alpha for DASS and IWPQ

Variable	Depression	Scale Anxiety	Stress
Gender	*U = 27,090.5*	*U = 23,323.5***	*U = 24,137.5**
1. Male	7.23 (7.13)	8.30 (7.74)	9.63 (8.20)
2. Female	7.31 (7.17)	9.94 (7.68)	11.13 (8.51)
Age	$\chi^2(2) = 14.83$***	$\chi^2(2) = 21.28$***	$\chi^2(2) = 20.56$***
1. 18–34	9.02 (8.00)	11.66 (9.30)	13.03 (9.50)
2. 35–54	6.49 (6.54)	8.23 (6.49)	9.37 (7.50)
3. > 55	4.29 (5.43)	3.71 (5.31)	5.71 (6.41)
Post hoc test	1 > 2***; 1 > 3*	1 > 2***; 1 > 3**; 2 > 3*	1 > 2***; 1 > 3***
Education	$\chi^2(4) = 4.50$	$\chi^2(4) = 17.55$***	$\chi^2(4) = 9.48$*
1. High school	9.50 (8.82)	14.20 (9.97)	12.80 (11.23)
2. Three-year college	10.73 (8.78)	14.82 (8.23)	15.55 (8.48)
3. Undergraduate	7.39 (7.20)	9.01 (7.43)	10.64 (8.39)
4. Postgraduate	6.67 (6.68)	8.50 (7.43)	9.70 (7.97)
Post hoc test	–	1 > 4**; 2 > 3***; 2 > 4***	2 > 3*; 2 > 4**
Occupation	*U = 22,810***	*U = 23,010***	*U = 23,080***
1. State/public organization/ institution	5.91 (5.62)	7.88 (6.82)	9.18 (7.69)
2. Private enterprise/others	8.24 (7.92)	10.22 (8.21)	11.42 (8.78)
Job Experience	$\chi^2(3) = 13.437$***	$\chi^2(3) = 13.16$***	$\chi^2(3) = 16.30$***
1. < 5	8.77 (7.72)	11.04 (8.74)	12.61 (9.46)
2. 5–10	7.07 (7.17)	8.93 (7.94)	10.03 (8.40)
3. 10–20	6.87 (6.68)	8.91 (6.89)	10.15 (7.48)
4. > 20	4.71 (6.26)	5.71 (5.60)	6.41 (6.94)
Post hoc test	1 > 4***	1 > 4***	1 > 4***; 3 > 4*
Marital	$\chi^2(2) = 22.53$**	$\chi^2(2) = 21.52$**	$\chi^2(2) = 23.26$**
1. Married	6.89 (6.80)	8.69 (7.37)	10.08 (8.09)
2. Divorced/widowed	3.89 (6.23)	6.89 (5.67)	5.33 (5.13)
3. Single	11.53 (8.46)	14.47 (9.19)	15.57 (9.65)
Post hoc test	1 < 3***; 2 < 3***	1 < 3***; 2 < 3***	1 < 2**; 1 < 3*** 2 < 3***
Number of children	$\chi^2(2) = 12.84$***	$\chi^2(2) = 25.42$***	$\chi^2(2) = 16.02$***
1. 0	10.38 (8.16)	13.94 (8.50)	14.66 (9.19)
2. 1–3	6.71 (6.70)	8.53 (7.33)	9.81 (8.07)
3. > 3	7.69 (8.56)	8.38 (7.89)	10.25 (8.51)
Post hoc test	1 > 2***	1 > 2***; 1 > 3***	1 > 2***
Workspace	*U = 19,338***	*U = 19,942.5***	*U = 19,352.5***
1. Yes	5.80 (6.74)	7.76 (7.50)	8.59 (7.86)
2. No	7.98 (7.23)	9.96 (7.77)	11.41 (8.52)

Note(s): $n = 472$. *significant at $p < 0.05$, **<0.01, ***<0.001. Dunn–Bonferroni correction were applied for *post hoc* test following the significant of Kruskal–Wallis χ^2 test

Table 4.
Evaluation of mental well-being (DASS-21) by socio-demographic factors

Evaluation of the measurement and structural model

The results of CFA for examining the measurement model of DASS-21 and IWPQ before the structural model are displayed in Figure 1 and Table 6. The significance of χ^2 tests (all $p < 0.001$) implies inadequate fit; however, the additional fit indices reflected good fit to the data: SRMR (<0.06), CFI (>0.95), GFI (>0.95) and RMSEA (<0.08). All indicators also had significant factor loadings (β), indicating that the factors explained these items well (DASS: $0.38 < \beta < 0.64$, $0.03 <$ standard error (SE) < 0.04, $p < 0.001$; IWPQ:$0.55 < |\beta| < 0.88$, $0.033 < SE < 0.057$, $p < 0.001$).

In terms of the structural model, although the model displayed inadequate fit according to the χ^2 statistic ($\chi^2(658) = 1786.95$, $p < 0.001$), the other indices, CFI (>0.90), GFI (>0.90) and SRMR (<0.08), indicated moderate fit, while the RMSEA (<0.06) reflected a good fit (Table 6).

Variable	Task	Dimension Contextual	CWB
Gender	*U = 26,330.50*	*U = 22,977.00*	*U = 25,934.50*
1. Male	2.73 (0.71)	2.91 (0.56)	0.85 (0.73)
2. Female	2.76 (0.73)	2.70 (0.70)	0.92 (0.79)
Age	$\chi^2(2) = 0.75$	$\chi^2(2) = 0.62$	$\chi^2(2) = 1.95$
1. 18–34	2.78 (0.71)	2.76 (0.68)	1.02 (0.94)
2. 35–54	2.72 (0.74)	2.81 (0.65)	0.84 (0.66)
3. > 55	2.77 (0.75)	2.85 (0.53)	0.64 (0.47)
Education	$\chi^2(4) = 2.85$	$\chi^2(4) = 2.86$	$\chi^2(4) = 1.88$
1. High school	2.65 (0.76)	2.88 (0.58)	0.98 (0.71)
2. Three-year college	2.82 (0.77)	2.90 (0.76)	1.20 (1.13)
3. Undergraduate	2.81 (0.72)	2.80 (0.69)	0.89 (0.83)
4. Postgraduate	2.70 (0.73)	2.76 (0.62)	0.86 (0.66)
Occupation	*U = 27,004*	*U = 25,183*	*U = 24,647*
1. State/public organization/institution	2.73 (0.74)	2.74 (0.63)	0.78 (0.59)
2. Private enterprise/others	2.76 (0.72)	2.82 (0.67)	0.98 (0.86)
Job experience	$\chi^2(3) = 0.55$	$\chi^2(3) = 3.82$	$\chi^2(3) = 4.02$
1. < 5	2.72 (0.72)	2.75 (0.69)	0.94 (0.83)
2. 5–10	2.73 (0.75)	2.73 (0.68)	0.95 (0.84)
3. 10–20	2.77 (0.71)	2.85 (0.61)	0.86 (0.66)
4. > 20	2.79 (0.76)	2.88 (0.61)	0.66 (0.68)
Marital	$\chi^2(2) = 2.97$	$\chi^2(2) = 3.47$	$\chi^2(2) = 9.76$*
1. Married	2.74 (0.73)	2.79 (0.65)	0.89 (0.76)
2. Divorced/widowed	3.08 (0.74)	3.08 (0.67)	0.44 (0.41)
3. Single	2.69 (0.69)	2.71 (0.71)	1.10 (0.87)
Post hoc test	–	–	1 > 2*; 2 > 3**
Number of children	$\chi^2(2) = 2.12$	$\chi^2(2) = 1.08$	$\chi^2(2) = 3.44$
1. 0	2.72 (0.77)	2.71 (0.68)	1.09 (0.88)
2. 1–3	2.77 (0.70)	2.81 (0.64)	0.87 (0.74)
3. > 3	2.51 (0.90)	2.73 (0.75)	0.82 (0.83)
Workspace	*U = 21,619.5**	*U = 19,305.5***	*U = 20,985.0***
1. Yes	2.85 (0.72)	2.94 (0.69)	0.79 (0.77)
2. No	2.70 (0.73)	2.72 (0.67)	0.94 (0.76)

Note(s): $n = 472$. *significant at $p < 0.05$, **<0.01, ***<0.001. Dunn–Bonferroni correction were applied for *post hoc* test following the significant of Kruskal–Wallis χ^2 test

Table 5. Evaluation of productivity (IWPQ) by socio-demographic factors

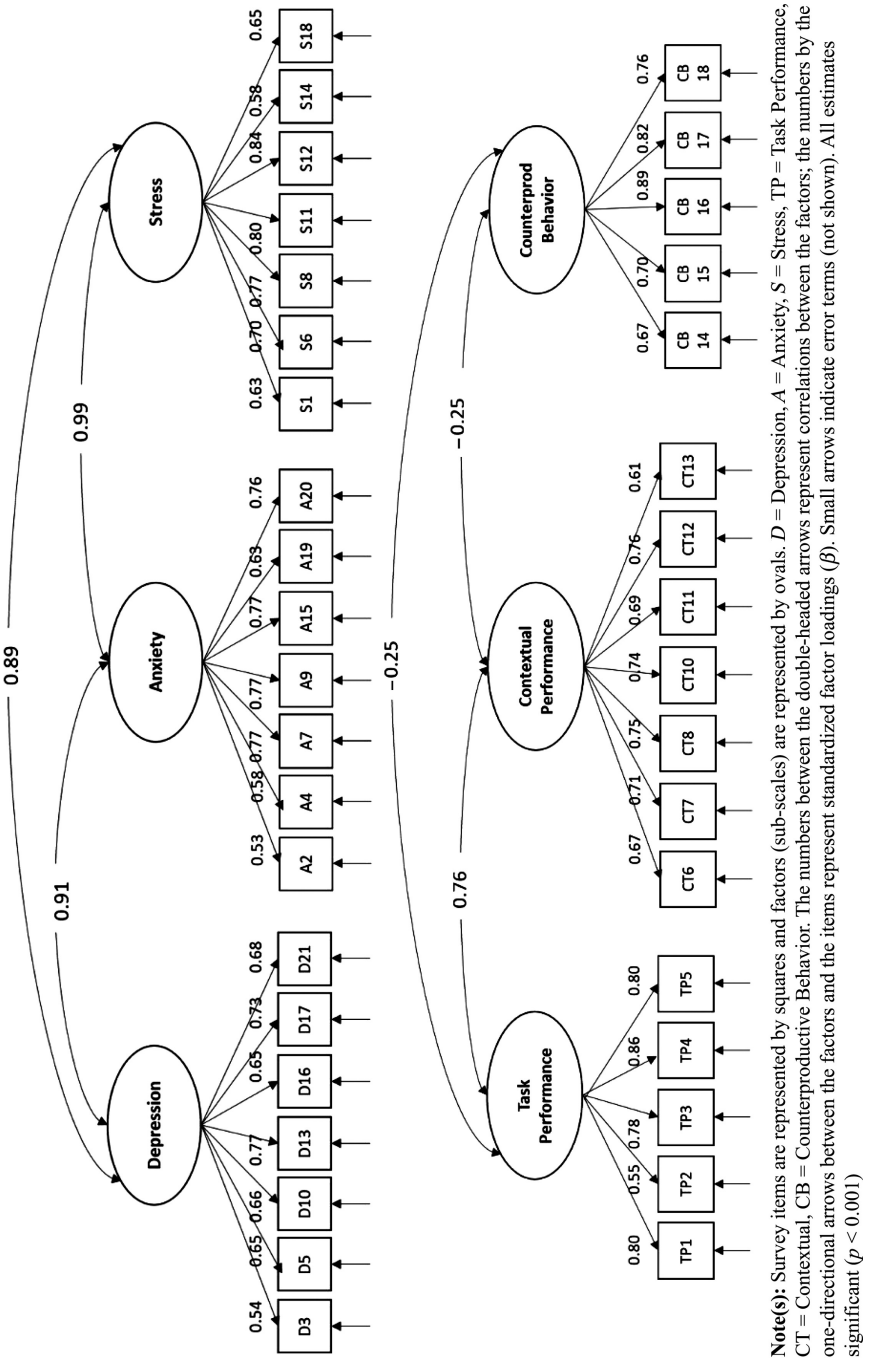
Figure 2 depicts the results of the structural model that showed each scale had a significant relationship with latent variables ($0.57 < |\beta| < 0.97$, all $p < 0.001$). The path coefficient between DASS-21 and IWPQ was significant ($\beta = -0.60, p < 0.001$), indicating an increase of one scale of DASS-21 that was correlated with 0.60 of the reduced IWPQ scores. This finding confirmed that the employees' mental well-being had a direct negative significant effect on productivity during WFH.

Discussion

This study examined to what extent employees' mental well-being affects their productivity while working from home and whether they differ across some socio-demographic factors in the context of COVID-19 crisis.

Hypothesis one

The results indicated that our respondents reported minimal to mild acute depression (81.6%), anxiety (35.4%) and stress (86.9%). It is surprising since the results are opposite to



Note(s): Survey items are represented by squares and factors (sub-scales) are represented by ovals. *D* = Depression, *A* = Anxiety, *S* = Stress, TP = Task Performance, CT = Contextual, CB = Counterproductive Behavior. The numbers between the double-headed arrows represent correlations between the factors; the numbers by the one-directional arrows between the factors and the items represent standardized factor loadings (β). Small arrows indicate error terms (not shown). All estimates significant ($p < 0.001$)

Figure 1.
Results from CFA model of DASS-21 (above) and IWPQ (below)

previous studies among Indonesia working population (Megatsari *et al.*, 2020; Putro and Riyanto, 2020). Nevertheless, compared to studies in China (Wang *et al.*, 2020), Spain (Rodríguez-Rey *et al.*, 2020) and India (Verma and Mishra, 2020), which employed the same measure (DASS-21), the anxiety symptoms were more prevalent for Indonesian teleworkers, while the prevalence of depression and stress were slightly lower or higher. Another similar finding was discovered in a global survey in which the Indonesian general population reported low stress level (Yamada *et al.*, 2021). While previous studies showed perceived distress among general working population, a study among mobile teleworkers in Italy (Moretti *et al.*, 2020) presented only a small amount of stress. Moreover, in China, people who worked at home also had perceived less anxiety and depression because they felt safer with having less contact with fewer people and became more satisfied with their job (Song *et al.*, 2020). Our data showed that respondents experienced less stress regardless of the potential increased family and household responsibilities as well as other strains. One explanation for this is that our study was conducted at the later stages of the pandemic when uncertainty about the pandemic-related information has already decreased as compared to prior studies by Megatsari *et al.* (2020) and Putro and Riyanto (2020), which was immediately followed by the abrupt shift in daily lives. The Indonesian government introduced PSBB on March 31, 2020, in response to the State of Emergency for Public Health, which enables regional governments to restrict public activities (Andriani, 2020). Since the first case of COVID-19 was announced on March 2, 2020, Indonesian people were panicked as their undesirable responses to cope with uncertainty, such as doing overbuying, which was reported several times (Wijaya, 2020). Due to the economic impact, the implementation of PSBB was relaxed at the beginning of June when society began "new normal," although the pandemic curve did not significantly decline (Andriani, 2020).

Our respondents also reported a considerably high level of productivity ($M = 8.6$ range 0–12), which was opposite to prior studies (Mustajab *et al.*, 2020; Putro and Riyanto, 2020). However, those studies were exploratory qualitative in nature, employing less rigorous methodology design with smaller sample size. Our findings, however, are similar to a study conducted in Denmark, which revealed that 55% Danish population became more productive during the pandemic (Ipsen *et al.*, 2020). In another Indonesian study, Susilo (2020) found that WFH increased employees' enjoyment, job satisfaction and motivation, which became the

Model	χ^2	df	CFI	GFI	RMSEA (90%CI)	SRMR
DASS	112.43	186	1	0.99	0 (0–0)	0.04
IWPQ	178.86	116	0.99	0.981	0.03 (0.024–0.043)	0.06
DASS ~ IWPQ	1,786.95	658	0.95	0.941	0.06 (0.057–0.064)	0.08

Table 6. Summary of fit indices of DASS-21 < IWPQ and model

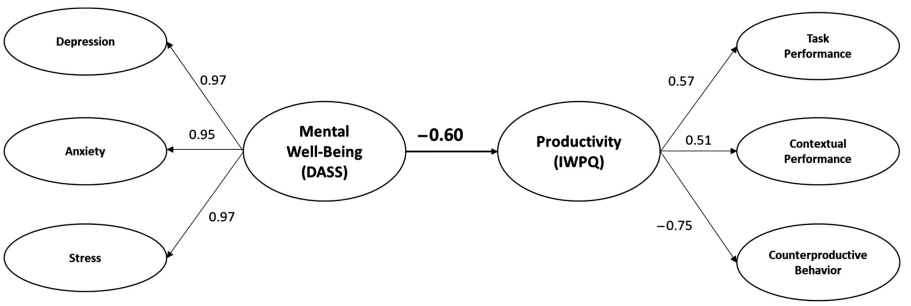


Figure 2. Path diagram of the model by SEM analysis, which explains the relationship between mental well-being and productivity. The numbers shown are parameter estimates (standardized beta β) and all significant ($p < 0.001$)

important determinants of job performance (Allen *et al.*, 2015). Data obtained from several European countries informed that there was a 50% increased of home-office practice, which was followed by relatively good performance. The respondents also reported that their actual performance was slightly better than three months before the pandemic and lockdown regulation (Prochazka *et al.*, 2020). Another study in China also found that employees who worked at home had higher job satisfaction and work engagement during the pandemic (Song *et al.*, 2020). Apparently, the individual characteristics had less impact on the employees' performance because the nature of the work itself (occupational characteristics) allowed them to achieve the same performance level when working at home compared to on-site (Kramer and Kramer, 2020). It implies that our sample represented some occupational groups that are well suited to WFH despite their lack of experience or resistance to adopt such a working structure in the past.

Hypothesis two

Regarding the psychological health differences across socio-demographic factors, we discovered that gender had a significant effect on perceived anxiety and stress but not on depression. This finding supports prior studies that found female were more likely to experience more distress than male either under normal circumstances (Blom *et al.*, 2016; Jonsdottir *et al.*, 2020) or during the pandemic (Rodríguez-Rey *et al.*, 2020; Wang *et al.*, 2020; Zhang *et al.*, 2020). Gender has become a predictor of psychosocial burden in a previous Indonesian survey (Megatsari *et al.*, 2020). For the same level of occupation – even higher-level managers – female employees were more susceptible to work-related stressors, which place them at risk for burnout (Blom *et al.*, 2016).

Similar to prior studies (Qiu *et al.*, 2020; Rodríguez-Rey *et al.*, 2020; Zhang *et al.*, 2020), younger respondents reported more distress as compared to the older counterparts. Younger adults were also more vulnerable to the negative emotions in Indonesia (Harlianty and Susanti, 2020; Megatsari *et al.*, 2020). Our *post hoc* analysis showed that the oldest group showed the least depression, anxiety and stress levels, indicating greater life experience and maturity to cope with life problems despite their higher risk of contracting the disease.

Furthermore, psychological distress varies among people with different levels of education. We found that a three-year college had the highest level of anxiety and stress, but not on depression, followed by a high-school level, while higher education level (≥ bachelor's degree) reported less distress. Our findings are in contrast to Megatsari *et al.* (2020) who found that lowest education levels had been linked to higher level of anxiety. While their study employed general working population and divided education level only into two categories: below high school and higher, we employed a more specific population (WFH employees) categorized into four levels of education (high school, three-year college, bachelor and graduate). Moreover, prior study found that teleworkers have been associated with knowledgeable workers and not feasible for low-level education and less knowledgeable workers, particularly in developing countries (Saltiel, 2020). The higher level of stress among the three-year-college workers than the high-school levels could be due to they are more concerned on the effect of pandemic. This education level group appeared to be less able to select and discern the abundant information spread on social media, hence worsening their emotional symptoms, while the high-school level group might possess less self-awareness of their health condition. Nevertheless, consistent with prior research, those who had higher education levels than three years of college reported less psychological distress (Wang *et al.*, 2020; Song *et al.*, 2020), indicating that better education is directly proportional to the employees' ability to respond to the pandemic.

Furthermore, unmarried respondents had higher depression, anxiety and stress levels, compared to respondents who have got married or divorced, separated or widowed. Our data are apparently counterintuitive, in which married people tended to feel more distress due to

the increased work–life conflict (Schieman *et al.*, 2020) during WFH in the situation of pandemic, as were previously reported (Putro and Riyanto, 2020). Nevertheless, our findings are in accordance with the studies in China and Spain, which showed that the unmarried population perceived higher level of distress (Rodríguez-Rey *et al.*, 2020; Wang *et al.*, 2020). These implied the importance of marriage, in terms of providing the emotional, financial and social support when an individual faced the crisis (Caputo and Simon, 2013; Grover and Helliwell, 2019).

Interestingly, those without children overcame psychological distress, which contradicted our general perception. Previous study revealed that during the outbreak, the work–life conflict increased due to an amplified role integration (Schieman *et al.*, 2020) among employees with children than without children, although both groups reported work–life conflict declined than before the pandemic. Work–life conflict is a common stressor associated with adverse psychological well-being, thus a restriction on most individual daily activities outside the household might explain a reduction of the work and family role conflict. Our study was conducted 2.5 months after the implementation of PSBB, which might reveal that parenthood issues seemed to be much easier than at the early stages of the pandemic. Our findings also support the results from a prior study (Rodríguez-Rey *et al.*, 2020), showing that having children appears to be a protective factor against the psychological distress during the pandemic. Our *post hoc* tests also revealed no differences between participants with 1–3 children and more than three.

Similar to Song *et al.* (2020), respondents who have been working in private or non-state organizations felt more distress, indicating that job security played a critical role in their mental well-being. Employees in the state/public organizations underwent less rate of income decrease compared to other types of organization and comparatively had higher levels of job satisfaction, work engagement and lower levels of turnover intention. Psychological distress also varies among employees with different job experiences. Those who had the least job experience encountered more distress, implying more extended employment is commonly associated with more robust social support and working responsibility (Yang *et al.*, 2016).

Hypothesis three

Not as expected, our hypothesis three was only partially supported that there is no significant productivity differences across socio-demographic factors unless for the availability of dedicated workspace. With respect to gender, these results contradict Feng and Savani's (2020) finding that WFH practice affected women's productivity and job satisfaction since the pandemic. Our data, however, correspond with Wong *et al.* (2020), which found that Hongkong female teleworkers benefited from WFH, in which they were able to cope with caring responsibilities at home. Theoretically, WFH could reduce gender disparities by providing women greater control over their schedules and providing men more childcare time to be invested in housework (Lyttelton *et al.*, 2020). Under normal circumstances, there were little to no gender disparities in work-related outcomes, such as job performance and job satisfaction (Roth *et al.*, 2012). Furthermore, it is a general practice for Indonesian family having house helpers or maids, either live-in or live-out, to assist in completing household chores whose tasks vary from cleaning, cooking, to babysitting (Bayuni, 2016; ILO, 2006). Moreover, gender gaps in parenting and household responsibilities tended to be smaller for more educated parents (Lareau, 2011), as reflected by our demographic sample. These might explain why Indonesian women could deal with the additional housework and childcare by having assistance from their maids, which allowed them to remain productive. On the other hand, no significant length of employment was found in productivity. This finding is in contrast to prior study, which concluded that employees with more experience had acquired job-relevant knowledge and skills directing to a higher level of work performance

(Schmidt *et al.*, 1986). A plausible explanation could be that higher perceived autonomy and lack of supervisory or objectively rating performance during telework (Allen *et al.*, 2015; Neirotti *et al.*, 2019) affecting positively to their self-reported performance among less-experienced employees.

It is hard to explain with our data the reason why the significant productivity difference was only discovered for CWB among widowed or divorced employees who reported lowest deviant behaviors. A possible explanation could be that the CWB dimension was less appropriately employed in the pandemic context despite its good validity and reliability. The task and contextual performance dimensions focused on individual behaviors (e.g. "I was able to carry out my work efficiently" and "I came up with creative solutions for new problems"), while CWB describes behaviors that are mainly conducted with others (e.g. "I talked to colleagues about the negative aspects of my work). Social isolation, reduced communication with co-workers and lack of supervisor support are the prior disadvantages of teleworking (Nakrošienė *et al.*, 2019; Weinert *et al.*, 2015) highlighted in the COVID-19 pandemic (Charoensukmongkol and Phungsoonthorn, 2020a, b). In accordance with the previous research, our results confirmed that the availability of dedicated workspace became the biggest constraints both on the stress level and productivity during WFH (Susilo, 2020; Wang *et al.*, 2020).

Hypothesis four

Regarding our path model, we found that teleworkers' mental well-being affected their productivity negatively during the pandemic, which supported H4. The results confirmed a part of the model by Donald *et al.* (2005), which stated that psychological well-being is the strongest predictor of self-rated productivity. The stress effect on job performance has also been well documented in prior literature (Burton *et al.*, 2008; Devonish, 2016). The insignificant productivity difference across most socio-demographic factors implied that the magnitude of distress was offset while working at home, as shown by participants' low level of psychological distress. However, this current study was conducted several months before Indonesia officially entered its first recession in 22 years. It was predicted that 5.5 million people could lose their jobs by the end of 2020. Furthermore, Indonesia has continued to have a higher fatality rate than the global average (Worldometers, 2020), owing to its poor general health and disparities within the healthcare system (Coconuts Jakarta, 2020). Greater job insecurity, increased worry about getting infected with coronavirus and additional burden such as caring for infected family members deteriorate their psychological health and productivity. Thus, further longitudinal study is warranted.

Our sample size and no significant relationship found between individual productivity and socio-demographic factors restricted us from establishing a moderation model or analyzing multiple-group comparison (Memon *et al.*, 2019). It remains unclear whether psychological distress affects younger employees' productivity to the same extent that it influences their older counterparts or the relationship between psychological health and work performance differed by the marital status, and others.

Practical implication

Notwithstanding the current WFH as a response to the pandemic, its positive impacts on the employees' productivity provide preliminary evidence that the number of workers who are willingly or able to WFH could be larger than as estimated. Before the pandemic, 7.9% of the world's workforce, or approximately 260 million workers (from 118 countries, representing 86% global employment), worked from home permanently (ILO, 2020). The potential for WFH across middle-income countries such as Indonesia has been estimated close to 16% of employees. A recent survey showed that most respondents preferred working remotely in the

future more frequently, more than half of the on-site workers who were willing to start working remotely (Slackhq, 2020; Wong *et al.*, 2020). Therefore, organizations may adopt WFH as a permanent feature of their future working arrangement. They need to identify either the individual or occupational characteristics that provide the most impact on employee productivity (Kramer and Kramer, 2020). Gottlieb *et al.* (2020) estimated that more than 70% of managerial and professional jobs could be undertaken from home, 39.6% for technician and associate professionals, and 49.6% for clerical support workers. On the other hand, the ability to work remotely was the lowest among low- and medium-skilled workers such as manufacturing operators and elementary occupations workers. The feasibility of WFH is related to the individual characteristics such as high-paying occupations, educational attainment, younger and personality (Raišiene *et al.*, 2020; Saltiel, 2020).

Although the differences in the productivity across socio-demographic factors were not observed, the differences in the psychological distress existed, which was also confirmed by our model that psychological health was a strong predictor for employees performance. Hence, organizations need to take into account these factors when developing strategies to mitigate the psychological risks and maintain productivity during WFH, which is in line with Raišiene *et al.* (2020), who found that telework efficiency and qualities depend on gender, age, education and work experience.

Males were more likely to report work–home interferences and ineffective communication, older generations felt difficulties in self-organization and maintaining motivation, while lower education showed lower organizational commitment. In the pandemic context, researchers have identified key remote work challenges, including work–home interference, ineffective communication and loneliness (Charoensukmongkol and Phungsoonthorn, 2020a; Wang *et al.*, 2020). Given that such challenges will affect employees' well-being and productivity during the crisis and beyond, scholars suggest some strategies: improving communication with co-workers and supervisors, designing flexible work arrangement based on work design perspective (Wang *et al.*, 2020), providing an appropriate working environment (e.g. ICT equipment, home office and childcare) and promoting the sharing of managerial best practices (OECD, 2020). For individuals, since the pandemic is still ongoing, employees should consider investing in the infrastructure required to WFH and creating home office spaces which discourage interruptions from family members (Gajendran and Harrison, 2007).

Limitations

Our study has several limitations. Firstly, this study was a cross-sectional design. Therefore, causal conclusion could not be depicted. To investigate the possible causality relationship (long-term effect) between mental well-being and productivity during the pandemic, a longitudinal design is needed. Consequently, it is of interest to explore whether the same effect remains or changes after Indonesia fell into the first recession on September 2020, and the number of infected cases increased significantly after July 2020 (Worldometers, 2020). Secondly, self-reported online questionnaires were administered using the snowball sampling strategy through our network with the consequence of social desirability and selection bias. The self-selected sample of convenience was predominantly female and well educated that potentially restricted the representativeness and generalizability of the findings. Thirdly, our measures, which have been used extensively and performed well across many populations, had a large number of indicators (total 38). Considering our data nature was categorical, a larger sample is required to build a more complex structural model (Kline, 2011), e.g. involving the moderation variables: whether gender or education level strengthen or weakens the relationship between employees' psychological health and productivity. Further investigation should identify sources of WFH stressors, which are commonly different

from those of the traditional working environment (Weinert *et al.*, 2015), and including them into the three factors work stress model in predicting employees' health and productivity (Donald *et al.*, 2005). Considering the continued physical distancing practice restricting the use of the face-to-face method, future research can exploit data collection by administering mixed-mode surveys.

Conclusion

Our study provides preliminary evidence on the employees' mental well-being and productivity in working from home during the pandemic. While the concept of WFH offers better flexibility and more work–life balance, compared to the working from office, the negative emotions escalation during the crisis could decrease their job performance. Nonetheless, our findings suggested that employees reported a relatively high work performance in parallel with less perceived distress. We also discovered that gender, age, education level, job experiences, marital status, number of children and nature of the organization played an essential role in the employees' psychological health but not in their productivity. The dedicated workspace availability influenced both psychological and performance outcomes. Our data suggested that psychological well-being was a strong predictor of the employees' work performance in the context of COVID-19. While the results are constrained within the scope of WFH practice in Indonesia, there may be implications for other countries. Further studies need to address the representativeness and generalizability issues and incorporate WFH-related stressors into a more complex model.

References

Afshar, V. (2020), "Working from home: average productivity loss of remote work is 1%", available at: https://www.zdnet.com/article/the-average-productivity-loss-of-remote-work-is-1/ (accessed 8 June 2020).

Allen, T.D., Golden, T.D. and Shockley, K.M. (2015), "How effective is telecommuting? Assessing the status of our scientific findings", *Psychological Science in the Public Interest*, Vol. 16 No. 2, pp. 40-68.

Andriani, H. (2020), "Effectiveness of large-scale social restrictions (PSBB) toward the new normal era during COVID-19 outbreak: a mini policy review", *Journal of Indonesian Health Policy and Administration*, Vol. 5 No. 2, pp. 61-65.

Barrot, J.N., Grassi, B. and Sauvagnat, J. (2020), "Sectoral effects of social distancing", available at: https://ssrn.com/abstract=3569446.

Bayuni, E.M. (2016), "Indonesians must have their maids", *The Jakarta Post*, available at: https://www.thejakartapost.com/news/2015/04/26/view-point-indonesians-must-have-their-maids.html (accessed 2 December 2020).

Blom, V., Bodin, L., Bergström, G. and Svedberg, P. (2016), "Applying the demand-control- support model on burnout in managers and non-managers", *International Journal of Workplace Health Management*, Vol. 9 No. 1, pp. 110-122.

Bloom, N., Liang, J., Roberts, J. and Ying, Z.J. (2015), "Does working from home work? Evidence from a Chinese experiment*", *The Quarterly Journal of Economics*, Vol. 130 No. 1, pp. 165-218.

Burton, W.N., Schultz, A.B., Dee, C.C. and Burton, W.N. (2008), "The association of worker productivity and mental health: a review of the literature", *International Journal of Workplace Health Management*, Vol. 1 No. 2, pp. 78-94.

Campbell, J.P. and Wiernik, B.M. (2015), "The modeling and assessment of work performance", *Annual Review of Organizational Psychology and Organizational Behavior*, Vol. 2, pp. 47-74.

Caputo, J. and Simon, R.W. (2013), "Physical limitation and emotional well-being: gender and marital status variations", *Journal of Health and Social Behavior*, Vol. 54 No. 2, pp. 240-256.

Charoensukmongkol, P. and Phungsoonthorn, T. (2020a), "The interaction effect of crisis communication and social support on the emotional exhaustion of university employees during the COVID-19 crisis", *International Journal of Business Communication*, September 2020, doi: 10.1177/2329488420953188.

Charoensukmongkol, P. and Phungsoonthorn, T. (2020b), "The effectiveness of supervisor support in lessening perceived uncertainties and emotional exhaustion of university employees during the COVID-19 crisis: the constraining role of organizational intransigence", *Journal of General Psychology*. doi: 10.1080/00221309.2020.1795613.

Coconuts Jakarta (2020), "Indonesia's COVID-19 death rate exceeds global average 6 months into outbreak: task force", available at: https://coconuts.co/jakarta/news/indonesias-covid-19-death-rate-exceeds-global-average-6-months-into-outbreak-task-force/ (accessed 7 December 2020).

Crosbie, T. and Moore, J. (2004), "Work–life balance and working from home", *Social Policy and Society*, Vol. 3 No. 3, pp. 223-233.

Dåderman, A.M. (2020), "Cross-Cultural adaptation, from Dutch to Swedish language, of the individual work performance questionnaire", *Work*, Vol. 65 No. 1, pp. 97-109.

Devonish, D. (2016), "Emotional intelligence and job performance: the role of psychological well-being", *International Journal of Workplace Health Management*, Vol. 9 No. 4, pp. 428-442.

Dingel, J.I. and Neiman, B. (2020), *How Many Jobs can be Done at Home?*, Working paper, Becker Friedman Institute, Chicago, 19 June 2020. doi: 10.1016/j.jpubeco.2020.104235.

Donald, I., Taylor, P., Johnson, S., Cooper, C., Cartwright, S. and Robertson, S. (2005), "Work environments, stress, and productivity: an examination using ASSET", *International Journal of Stress Management*, Vol. 12 No. 4, pp. 409-423.

Drapeau, A., Marchand, A. and Beaulieu-Prevost, D. (2012), "Epidemiology of psychological distress", in Abate, L. (Ed.), *Mental Illnesses - Understanding, Prediction and Control*, Intech Open, pp. 105-134.

Enrico, B. (2020), "Impact of covid-19 upon employment sector in Indonesia", available at: https://iclg.com/briefing/13306-impact-of-covid-19-upon-employment-sector-in-indonesia (accessed 15 August 2020).

Fachriansyah, R. (2020), "COVID-19: workers anxious over job security despite govt policies, survey finds", *The Jakarta Post*, available at: https://www.thejakartapost.com/news/2020/04/15/covid-19-workers-anxious-over-job-security-despite-govt-policies-survey-finds.html (accessed 18 August 2020).

Feng, Z. and Savani, K. (2020), "Covid-19 created a gender gap in perceived work productivity and job satisfaction: implications for dual-career parents working from home", *Gender in Management*, Vol. 35 Nos 7/8, pp. 719-736, doi: 10.1108/GM-07-2020-0202.

Field, A. (2005), *Discovering Statistics Using SPSS: (and Sex and Drugs and Rock "N" Roll)*, 2nd ed., SAGE Publications, Los Angeles.

Gajendran, R.S. and Harrison, D.A. (2007), "The good, the bad, and the unknown about telecommuting: meta-analysis of psychological mediators and individual consequences", *Journal of Applied Psychology*, Vol. 92 No. 6, pp. 1524-1541.

Gaudioso, F., Turel, O. and Galimberti, C. (2017), "The mediating roles of strain facets and coping strategies in translating techno-stressors into adverse job outcomes", *Computers in Human Behavior*, Vol. 69, pp. 189-196.

Gottlieb, C., Grobovšek, J. and Poschke, M. (2020), "Who can work at home around the world", *Covid Economics*, Vol. 8, pp. 71-91.

Greer, T.W. and Payne, S.C. (2014), "Overcoming telework challenges: outcomes of successful telework strategies", *Psychologist-Manager Journal*, Vol. 17 No. 2, pp. 87-111.

Grover, S. and Helliwell, J.F. (2019), "How's life at home? New evidence on marriage and the set point for happiness", *Journal of Happiness Studies*, Vol. 20 No. 2, pp. 373-390.

Hamouche, S. (2020), "COVID-19 and employees' mental health: stressors, moderators and agenda for organizational actions", *Emerald Open Research*, Vol. 2 No. 15, doi: 10.35241/emeraldopenres.13550.1.

Harlianty, R.A. and Susanti, S. (2020), "Study on awareness of covid-19, anxiety and compliance on social distancing in Indonesia during coronavirus disease 2019 (COVID-19) pandemic", available at: https://www.researchsquare.com/article/rs-44598/v1 (accessed 20 July 2020).

Hu, L.T. and Bentler, P.M. (1999), "Cutoff criteria for fit indexes in covariance structure analysis: conventional criteria versus new alternatives", *Structural Equation Modeling*, Vol. 6 No. 1, pp. 1-55, Taylor & Francis Group.

ILO (2006), *The Regulation of Domestic Workers in Indonesia: Current Laws*, International Standards and Best Practices, Jakarta.

ILO (2020), "Working from home: estimating the worldwide potential", available at: https://www.ilo.org/wcmsp5/groups/public/—ed_protect/—protrav/—travail/documents/briefingnote/wcms_743447.pdf (accessed 18 August 2020).

Ipsen, C., Kirchner, K. and Hansen, J.P. (2020), "Experiences of working from home in times of covid-19 International survey conducted the first months of the national lockdowns March-May, 2020", available at: https://orbit.dtu.dk/en/publications/experiences-of-working-from-home-in-times-of-covid-19-internation (accessed 19 May 2020).

Jahanshahi, A.A., Dinani, M.M., Madavani, A.N., Li, J. and Zhang, S.X. (2020), "The distress of Iranian adults during the Covid-19 pandemic – more distressed than the Chinese and with different predictors", *Brain, Behavior, and Immunity*, Vol. 87, pp. 124-125.

Jaiswal, A. and Arun, C.J. (2020), "Unlocking the COVID-19 lockdown: work from home and its impact on employees", available at: https://www.researchsquare.com/article/rs-34556/v1 (accessed 12 August 2020).

Jonsdottir, I.J., Rafnsdottir, G.L. and Ólafsdóttir, T. (2020), "Job strain, gender and well-being at work: a case study of public sector line managers", *International Journal of Workplace Health Management*, Vol. 13 No. 4, pp. 445-460.

Kline, R.B. (2011), *Principles and Practice of Structural Equation Modeling*, 3rd ed., The Guilford Press, New York, doi: 10.5840/thought194520147.

Koopmans, L. (2016), "Cross-cultural adaptation of the individual work performance questionnaire", *Work*, Vol. 53, pp. 609-619.

Koopmans, L., Coffeng, J.K., Bernaards, C.M., Boot, C.R., Hildebrandt, V.H., De Vet, H.C. and Van Der Beek, A.J. (2014), "Responsiveness of the individual work performance questionnaire", *BMC Public Health*, Vol. 14 No. 1, doi: 10.1186/1471-2458-14-513.

Kramer, A. and Kramer, K.Z. (2020), "The potential impact of the Covid-19 pandemic on occupational status, work from home, and occupational mobility", *Journal of Vocational Behavior*, Vol. 119 No. 103442, doi: 10.1016/j.jvb.2020.103442.

Kuo, T.H. and Ho, L.A. (2010), "Individual difference and job performance: the relationships among personal factors, job characteristics, flow experience, and service quality", *Social Behavior and Personality*, Vol. 38 No. 4, pp. 531-552.

Lareau, A. (2011), *Unequal Childhoods: Class, Race, and Family Life*, 2nd ed., University of California Press, Berkeley, available at: http://www.jstor.org/stable/10.1525/j.ctt1ppgj4.

Lovibond, S.H. and Lovibond, P.F. (1996), *Manual for the Depression Anxiety Stress Scales*, Psychology Foundation of Australia, Sidney.

Lyttelton, T., Zang, E. and Musick, K. (2020), "Gender differences in telecommuting and implications for inequality at home and work", available at: https://ssrn.com/abstract=3645561.

Megatsari, H., Laksono, A.D., Ibad, M., Herwanto, Y.T., Sarweni, K.P., Geno, R.A.P. and Nugraheni, E. (2020), "The community psychosocial burden during the COVID-19 pandemic in Indonesia", *Heliyon*, Vol. 6 No. 10, e05136.

Memon, M.A., Cheah, J.H., Ramayah, T., Ting, H., Chuah, F. and Cham, T.H. (2019), "Moderation analysis: issues and guidelines", *Journal of Applied Structural Equation Modeling*, Vol. 3 No. 1, pp. i-xi.

Mîndrilă, D. (2010), "Maximum likelihood (ML) and diagonally weighted least squares (DWLS) estimation procedures: a comparison of estimation bias with ordinal and multivariate non-normal data", *International Journal of Digital Society*, Vol. 1 No. 1, pp. 60-66.

Moretti, A., Menna, F., Aulicino, M., Paoletta, M., Liguori, S. and Iolascon, G. (2020), "Characterization of home working population during covid-19 emergency: a cross-sectional analysis", *International Journal of Environmental Research and Public Health*, Vol. 17 No. 17, pp. 1-13.

Morikawa, M. (2020), "COVID-19, teleworking, and productivity", available at: https://voxeu.org/article/covid-19-teleworking-and-productivity (accessed 19 August 2020).

Mustajab, D., Bauw, A., Rasyid, A., Irawan, A., Akbar, M.A. and Hamid, M.A. (2020), "Working from home phenomenon as an effort to prevent COVID-19 attacks and its impacts on work productivity", *International Journal of Applied Business*, Vol. 4 No. 9, pp. 13-21.

Nakrošienė, A., Bučiūnienė, I. and Goštautaitė, B. (2019), "Working from home: characteristics and outcomes of telework", *International Journal of Manpower*, Vol. 40 No. 1, pp. 87-101.

Neirotti, P., Raguseo, E. and Gastaldi, L. (2019), "Designing flexible work practices for job satisfaction: the relation between job characteristics and work disaggregation in different types of work arrangements", *New Technology, Work and Employment*, Vol. 34 No. 2, pp. 116-138.

Nye, C.D. and Drasgow, F. (2011), "Assessing goodness of fit: simple rules of thumb simply do not work", *Organizational Research Methods*, Vol. 14 No. 3, pp. 548-570.

OECD (2020), "Productivity gains from teleworking in the post COVID-19 era: How can public policies make it happen?", Working paper, OECD Policy Responses to Coronavirus (COVID-19), 7 September 2020.

Oei, T.P.S., Sawang, S., Goh, Y.W. and Mukhtar, F. (2013), "Using the depression anxiety stress scale 21 (DASS-21) across cultures", *International Journal of Psychology*, Vol. 48 No. 6, pp. 1018-1029.

Onie, S., Kirana, A.C., Alfian, A., Mustika, N.P., Adesla, V. and Ibrahim, R. (2020), "Assessing the predictive validity and reliability of the DASS-21, PHQ-9 and GAD-7 in an Indonesian sample", available at: https://psyarxiv.com/eqcm9/ (accessed 5 July 2020).

Ozimek, A. (2020), "The future of remote work | press, news & media coverage", available at: https://www.upwork.com/press/economics/the-future-of-remote-work/ (accessed 19 August 2020).

Prochazka, J., Scheel, T., Pirozek, P., Kratochvil, T., Civilotti, C., Bollo, M. and Maran, D.A. (2020), "Data on work-related consequences of COVID-19 pandemic for employees across Europe", *Data in Brief*, Vol. 32, p. 106174, doi: 10.1016/j.dib.2020.106174.

Purwanto, A., Asbari, M., Fahlevi, M., Mufid, A., Agistiawati, E., Cahyono, Y. and Suryani, P. (2020), "Impact of work from home (WFH) on Indonesian teachers performance during the COVID-19 pandemic: an exploratory study", *International Journal of Advanced Science and Technology*, Vol. 29 No. 5, pp. 6235-6244.

Putra, P.Y.T. and Riyanto, S. (2020), *The Effect of Work from Home (WFH) on Employee Performance in the Sub Directorate Bibliography*, National Library of Indonesia, available at: https://www.academia.edu/42783114/The_Effect_of_Work_From_Home_WFH_On_Employee_Performance_In_The_Sub_Directorate_Bibliography_National_Library_of_Indonesia.

Putro, S.S. and Riyanto, S. (2020), "Evaluating stress impact of working from home during covid-19 pandemic self- quarantine period in Indonesia", available at: https://www.academia.edu/42785798/Evaluating_Stress_Impact_of_Working_from_Home_during_Covid_19_Pandemic_Self_quarantine_Period_in_Indonesia.

Qiu, J., Shen, B., Zhao, M., Wang, Z., Xie, B. and Xu, Y. (2020), "A nationwide survey of psychological distress among Chinese people in the COVID-19 epidemic: implications and policy recommendations", *General Psychiatry*, Vol. 33 No. 2, pp. 1-6, doi: 10.1136/gpsych-2020-100213.

Radó, M.K. (2020), "Tracking the effects of parenthood on subjective well-being: evidence from Hungary", *Journal of Happiness Studies*, Vol. 21, pp. 2069-2094.

Raišiene, A.G., Rapuano, V., Varkulevičiute, K. and Stachová, K. (2020), "Working from home-Who is happy? A survey of Lithuania's employees during the COVID-19 quarantine period", *Sustainability (Switzerland)*, Vol. 12 No. 13, doi: 10.3390/su12135332.

Ramdani, Z., Marliani, R. and Rahman, A.A. (2019), "The individual work performance scale: a psychometric study and its application for employee performance", *Humanities and Social Sciences Reviews*, Vol. 7 No. 5, pp. 405-414.

Ramos-Villagrasa, P.J., Barrada, J.R., Fernández-del-Río, E. and Koopmans, L. (2019), "Assessing job performance using brief self-report scales: the case of the individual work performance questionnaire", *Revista de Psicologia Del Trabajo Y De Las Organizaciones*, Vol. 35 No. 3, pp. 195-205.

Renaldi, A. (2020), "Working from home amid coronavirus in Indonesia", available at: https://www.vice.com/en/article/wxebp5/coronavirus-work-from-home-indonesia.

Rodríguez-Rey, R., Garrido-Hernansaiz, H. and Collado, S. (2020), "Psychological impact and associated factors during the initial stage of the coronavirus (COVID-19) pandemic among the general population in Spain", *Frontiers in Psychology*, Vol. 11, doi: 10.3389/fpsyg.2020.01540.

Rosseel, Y. (2012), "Lavaan: an *R* package for structural equation modeling", *Journal of Statistical Software*, Vol. 48 No. 2, pp. 1-36.

Roth, P.L., Purvis, K.L. and Bobko, P. (2012), "A meta-analysis of gender group differences for measures of job performance in field studies", *Journal of Management*, Vol. 38 No. 2, pp. 719-739.

Rotundo, M. and Sackett, P.R. (2002), "The relative importance of task, citizenship, and counterproductive performance to global ratings of job performance: a policy-capturing approach", *The Journal of Applied Psychology*, Vol. 87 No. 1, pp. 66-80.

Rudolph, C.W., Allan, B., Clark, M., Hertel, G., Hirschi, A., Kunze, F., Shockley, K., Shoss, M., Sonnentag, S. and Zacher, H. (2020), "Pandemics: implications for research and practice in industrial and organizational psychology", *Industrial and Organizational Psychology: Perspectives on Science and Practice*, available at: https://psyarxiv.com/k8us2/ (accessed 10 May 2020).

Saltiel, F. (2020), "Who can work from home in developing countries?", *Covid Economics*, Vol. 6, April 2020, pp. 104-118.

Saputra, M.B. (2018), "Who wants to be an Indonesian civil servant? Almost everyone. – the diplomat", available at: https://thediplomat.com/2018/10/who-wants-to-be-an-indonesian-civil-servant-almost-everyone/ (accessed 15 August 2020).

Schieman, S., Badawy, P. and Milkie, M.A. (2020), "Work-life conflict during the COVID-19 pandemic", *Socius: Sociological Research for a Dynamic World*, Vol. 7, pp. 1-9, doi: 10.1177/2378023120982856.

Schmidt, F.L., Hunter, J.E. and Outerbridge, A.N. (1986), "Impact of job experience and ability on job knowledge, work sample performance, and supervisory ratings of job performance", *Journal of Applied Psychology*, Vol. 71 No. 3, pp. 432-439.

Shaukat, N., Ali, D.M. and Razzak, J. (2020), "Physical and mental health impacts of COVID-19 on healthcare workers: a scoping review", *International Journal of Emergency Medicine*, Vol. 13, p. 40.

Slackhq (2020), "Report: remote work in the age of covid-19", available at: https://slackhq.com/report-remote-work-during-coronavirus (accessed 12 August 2020).

Song, L., Wang, Y., Li, Z., Yang, Y. and Li, H. (2020), "Mental health and work attitudes among people resuming work during the COVID-19 pandemic: a cross-sectional study in China", *International Journal of Environmental Research and Public Health*, Vol. 17, doi: 10.3390/ijerph17145059.

Soto-Rubio, A., Giménez-Espert, M.D.C. and Prado-Gascó, V. (2020), "Effect of emotional intelligence and psychosocial risks on burnout, job satisfaction, and nurses' health during the covid-19 pandemic", *International Journal of Environmental Research and Public Health*, Vol. 17, p. 21, doi: 10.3390/ijerph17217998.

Staples (2011), "There's No place like a home office: Staples survey shows telecommuters are happier and healthier, with 25% less stress when working from home | business wire", available at: https://www.businesswire.com/news/home/20110719005318/en/There's-Place-Home-Office-Staples-Survey-Shows (accessed 9 July 2020).

Suarlan (2017), "Teleworking for Indonesian civil servants: problems and actors", *Bisnis Dan Birokrasi: Jurnal Ilmu Administrasi Dan Organisasi*, Vol. 24 No. 2, pp. 100-109.

Susilo, D. (2020), "Revealing the effect of work-from-home on job performance during the covid-19 Crisis: empirical evidence from Indonesia", *The Journal of Contemporary Issues in Business and Government*, Vol. 26 No. 1, pp. 23-40.

Tavares, A.I. (2017), "Telework and health effects review", *International Journal of Healthcare*, Vol. 3 No. 2, pp. 30-36.

Vaziri, H., Casper, W.J., Wayne, J.H. and Matthews, R.A. (2020), "Changes to the work–family interface during the COVID-19 pandemic: examining predictors and implications using latent transition analysis", *Journal of Applied Psychology*, Vol. 105 No. 10, pp. 1073-1087.

Verma, S. and Mishra, A. (2020), "Depression, anxiety, and stress and socio-demographic correlates among general Indian public during COVID-19", *International Journal of Social Psychiatry*, Vol. 66 No. 8, pp. 756-762.

Wang, B., Liu, Y., Qian, J. and Parker, S.K. (2020), "Achieving effective remote working during the COVID-19 pandemic: a work design perspective", *Applied Psychology: An International Review*, Vol. 70 No. 1, pp. 16-59, doi: 10.1111/apps.12290.

Wang, C., Pan, R., Wan, X., Tan, Y., Xu, L., Ho, C.S. and Ho, R.C. (2020), "Immediate psychological responses and associated factors during the initial stage of the 2019 coronavirus disease (COVID-19) epidemic among the general population in China", *International Journal of Environmental Research and Public Health*, Vol. 17, doi: 10.3390/ijerph17051729.

Weinert, C., Maier, C. and Laumer, S. (2015), "Why are teleworkers stressed? An empirical analysis of the causes of telework-enabled stress", *Proceedings Der 12 Internationalen Tagung Wirtschaftsinformatik*, Osnabrück, Germany, pp. 1407-1421.

Widyastuti, T. and Hidayat, R. (2018), "Adaptation of individual work performance questionnaire (IWPQ) into bahasa Indonesia", *International Journal of Research Studies in Psychology*, Vol. 7 No. 2, pp. 101-112.

Wijaya, T. (2020), "Factor Analysis of panic buying during the covid-19 period in Indonesia", *SSRN Electronic Journal*, available at: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3603750 (accessed November 2020).

Wilson, J.M., Lee, J., Fitzgerald, H.N., Oosterhoff, B., Sevi, B. and Shook, N.J. (2020), "Job insecurity and financial concern during the COVID-19 pandemic are associated with worse mental health", *Journal of Occupational and Environmental Medicine*, Vol. 62 No. 9, pp. 686-691.

Wong, A.H.K., Cheung, J.O. and Chen, Z. (2020), "Promoting effectiveness of 'working from home': findings from Hong Kong working population under COVID-19", *Asian Education and Development Studies*, Vol. 10 No. 2, pp. 210-228, doi: 10.1108/AEDS-06-2020-0139.

Worldometers (2020), "Indonesia coronavirus: 575,796 cases and 17,740 deaths - worldometer", available at: https://www.worldometers.info/coronavirus/country/indonesia/ (accessed 7 December 2020).

Xiang, Y.T., Yang, Y., Li, W., Zhang, L., Zhang, Q., Cheung, T. and Ng, C.H. (2020), "Timely mental health care for the 2019 novel coronavirus outbreak is urgently needed", *The Lancet Psychiatry*, Vol. 7 No. 3, pp. 228-229.

Yamada, Y., Ćepulić, D.B., Coll-Martín, T., Debove, S., Gautreau, G., Han, H., Rasmussen, J., Tran, T.P., Travaglino, G.A. and Lieberoth, A. (2021), "COVIDiSTRESS Global Survey dataset on psychological and behavioural consequences of the COVID-19 outbreak", *Scientific Data*, Vol. 8 No. 1, pp. 1-20.

Yang, T., Shen, Y., Zhu, M., Liu, Y., Deng, J. and Chen, Q. (2016), "Effects of Co-worker and supervisor support on job stress and presenteeism in an aging workforce: a structural equation modelling approach", *International Journal of Environment Research and Public Health*, Vol. 13 No. 72, pp. 1-15.

Zhang, S.X., Wang, Y., Jahanshahi, A.A., Jia, J. and Schmitt, V.G.H. (2020), "First study on mental distress in Brazil during the COVID-19 crisis", available at: https://www.medrxiv.org/content/10.1101/2020.04.18.20070896v4 (accessed 4 June 2020).

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