

Teleworking and Psychological Well-being: Insights and Applications for TVET Institutions

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Abstract

The shift to teleworking has reshaped the work environment, introducing new dynamics and challenges. This transition is particularly relevant in the context of Technical and Vocational Education and Training (TVET), where preparing students for the evolving job market is essential. This study addresses the limited scientific analysis of how teleworking affects psychological well-being. Understanding these impacts is crucial for TVET institutions to equip students with the skills needed to thrive in remote working environments. The objectives are to identify the determinants of psychological well-being related to teleworking, analyze their impact, and propose a conceptual model linking these determinants to well-being. This study aims to fill the gap in existing research by providing concrete evidence and insights. The methodology involves a quantitative approach, using a survey questionnaire administered to 107 participants from a selected area. Data collection focuses on various factors influencing psychological well-being, and the analysis employs statistical methods to identify significant determinants and their relationships. The findings reveal key determinants of psychological well-being in teleworking, such as resilience, time management, and technology proficiency. These determinants are synthesized into a conceptual model that highlights their impacts and interconnections. The study's significance extends to TVET institutions by enhancing support services, providing mental health resources and counseling, establishing mentorship programs, and fostering partnerships with employers. These initiatives aim to better prepare students for teleworking, contributing to a healthier, more resilient workforce.

1. Introduction

The advent of teleworking has transformed the traditional work environment, presenting both opportunities and challenges that are particularly significant for academic institutions. As the job market evolves, academic institutions must adapt to prepare students for a future where remote work is increasingly prevalent.

Teleworking, accelerated by the COVID-19 pandemic, has brought about a paradigm shift in how organizations operate. Staying at home was said to be unbearable, where the majority of employees experienced

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stress, boredom, and feelings of confinement (Mulugeta, 2021). In addition, employee well-being, defined as psychological and physical health, is crucial at the organizational level. Employees with higher well-being are associated with better job performance, improved productivity, and positive behaviors (Catană et al., 2022). Despite these insights, there is a notable gap in understanding how teleworking specifically affects the psychological well-being of employees.

This study addresses the critical need to explore the determinants of psychological well-being in teleworking environments. The primary objectives are to identify these determinants, analyze their effects on psychological well-being, and develop a conceptual model that elucidates these relationships. Key constructs examined in this research include resilience, time management, and technology proficiency, all of which are pivotal to psychological well-being in a teleworking context. The conceptual model developed in this study will highlight the interactions between these variables and their collective impact on well-being. The findings aim to assist academic institutions in better preparing students and future workers for the demands of teleworking.

The contributions of this study are manifold, primarily emphasizing the importance of self-determination, dispositional tendency, and work-life balance in enhancing employee well-being in teleworking environments. This model provides actionable insights into strategies organizations can employ to foster self-determination, manage dispositional tendencies, and ensure a healthy work-life balance. Additionally, the study underscores the relevance of these findings for Technical and Vocational Education and Training (TVET) institutions adapting to teleworking. By tailoring TVET programs to enhance trainees' self-determination and work-life balance, these institutions can better prepare individuals for the challenges of remote work. Ultimately, this research enriches the growing body of knowledge on teleworking and psychological well-being, offering practical implications for organizations and employees alike. By focusing on enhancing self-determination, managing dispositional tendencies, ensuring work-life balance, and leveraging technology effectively, organizations can create a supportive teleworking environment that promotes psychological well-being.

2. Theoretical Background

Teleworking, also known as remote working, has become a prominent work arrangement due to advancements in information and communication technologies (ICT). This arrangement allows employees to work outside traditional office settings, often from home, using digital tools to stay connected with their employers and colleagues. Teleworking has been associated with both positive and negative impacts on employees' psychological well-being.

Training and development are crucial for organizational success, equipping employees with the necessary skills and knowledge to achieve organizational goals (Salleh & Sulaiman, 2017). In a telework context, organizations must adapt their training strategies to support remote employees effectively. Competencies are essential for effective workplace performance, and HR practitioners must focus on enhancing these through targeted training and development programs (Salleh & Sulaiman, 2019). Malaysia faces a shortage of high-skilled workers due to many professionals working abroad. To address this, the government introduced Talent Corporation in 2011 to strengthen the local talent pool, which includes addressing challenges unique to telework environments (Puteh et al., 2012). In addition to challenges faced by organizations, women entrepreneurs also encounter specific issues, such as funding and family support. Future research should consider how technology, globalization, and social media impact these challenges, emphasizing the relevance of telework in shaping the entrepreneurial landscape for women (Azizan et al., 2017).

Teleworking is defined as a flexible work arrangement where employees perform their job duties from a remote location, primarily using ICT to communicate and collaborate with colleagues (Catană et al., 2022). Various forms of teleworking include mobile telework, home-based telework, and telecentres, each with distinct characteristics based on the location and nature of work performed. Mobile telework involves frequent travel to maximize service delivery, while home-based telework is conducted entirely from home. Telecentres are local facilities that reduce commuting costs by providing a dedicated workspace for remote employees (Catană et al., 2022).

The Internet of Things (IoT) is revolutionizing the retail industry by enhancing efficiency, quality, and work ethics through connected devices and unmanned store apps, contributing towards Industry 4.0 (Hamidi et al., 2020). Similarly, telework leverages technology to improve productivity and work-life balance. Additionally, student assessments have evolved with technology to improve efficiency and support diverse learning styles, which telework complements by enabling remote assessments and offering flexible, technology-driven tools for educators and students (Hamidi et al., 2013).

Well-being is a multi-dimensional concept that encompasses various aspects such as welfare, life satisfaction, quality of life, good health, autonomy, happiness, life purpose, self-acceptance, comfort, prosperity, security, and positive relationships with others (Campbell, 2016). Well-being can be categorized into subjective well-being, psychological well-being, and social well-being. Subjective well-being involves cognitive and affective evaluations

of one's life, psychological well-being pertains to the absence of dysfunction and distress impacting daily experiences, and social well-being is associated with social interactions and acceptance (Catană et al., 2022).

Understanding emotional responses and their impact on productivity and well-being is crucial. Lokman's Emotion and Importance Quadrant (LEIQ)TM model helps identify factors affecting emotions, demonstrated through case studies on employee happiness and student well-being. This model can inform strategic decision-making to enhance well-being and productivity, especially in telework environments (Lokman et al., 2019).

Psychological well-being is crucial for positive functioning at both interpersonal and intrapersonal levels. It involves connecting with others, maintaining self-centered attitudes, and achieving a sense of control and personal growth. Subjective well-being reflects life satisfaction and impact judgment (Burns, 2016). Psychological well-being is underpinned by happiness and life satisfaction, essential for an individual's quality of life in the 21st century (Baigiu & Simionescu-Panait, 2021). The concept emphasizes the importance of mental health beyond merely being free from physical ailments, highlighting the need for self-acceptance, positive relationships, autonomy, mastery of the environment, purpose in life, and personal growth.

Enterprise Architecture (EA) aligns business and IT to optimize resources, improve efficiency, and reduce redundancy (Hussein et al., 2020). In telework settings, organizations must assess and enhance self-determination, dispositional tendencies, technology management, and work-life balance to ensure employee well-being and productivity. EA is crucial for public sector transformation but faces sustainability challenges. Identifying issues and key factors for sustaining EA practices can provide a structured framework for managing remote work environments effectively (Hussein et al., 2020). Additionally, Hussein et al. (2019) validated an instrument for assessing EA readiness in the Malaysian Public Sector using the Content Validity Index, involving expert feedback. This highlights the importance of readiness and structured frameworks in managing remote work environments effectively.

Teleworking offers several benefits, such as increased flexibility, reduced commuting time, and better work-life balance. These advantages can enhance employees' psychological well-being by providing them with more control over their work environment and schedule (Giménez-Nadal et al., 2020). However, teleworking can also pose challenges, including feelings of isolation, blurred boundaries between work and personal life, and increased stress due to the need for constant availability (Crawford, 2022).

Big Data and Analytics (BDA) are essential for quality decision-making in government, revealing trends and patterns that improve public policy, service delivery, and organizational management (Zain et al., 2023). In the context of telework, BDA can enhance remote work efficiency by providing data-driven insights to optimize productivity and employee well-being.

Studies have shown that teleworking can impact psychological well-being in various ways. For instance, employees who telework experience higher levels of job satisfaction and productivity, attributed to the flexibility and autonomy teleworking provides (Lunde et al., 2022). Conversely, teleworking can lead to emotional exhaustion, especially when employees struggle to maintain work-life balance and face increased demands from both personal and professional fronts (Bhumika, 2020).

In the work environment, teleworking can significantly influence psychological well-being. The ability to work remotely provides employees with the opportunity to create a personalized and comfortable work setting, potentially leading to increased job satisfaction and reduced stress (Clark et al., 2021). However, the lack of physical interaction with colleagues can lead to feelings of loneliness and disconnection, negatively impacting psychological well-being. Therefore, organizations must implement strategies to foster virtual collaboration and social interaction among remote employees (Crawford, 2022).

Leadership in e-business faces unique challenges. Al Harthy et al. (2019) suggests solutions to enhance leadership transformation to meet smart business requirements. These insights can be extended to telework settings to improve leadership effectiveness in remote environments.

Time-related aspects of teleworking, such as flexibility in work hours, play a crucial role in shaping employees' psychological well-being. Flexibility allows employees to manage their work and personal responsibilities more effectively, leading to improved well-being (Giménez-Nadal et al., 2020). However, without proper time management, teleworking can blur the boundaries between work and personal life, resulting in increased stress and burnout (Madhusudhanan et al., 2021). It is essential for employees to establish clear schedules and routines to maintain a healthy work-life balance.

On a personal level, teleworking can affect psychological well-being based on individual preferences and circumstances. Some employees may thrive in a remote work environment, enjoying autonomy and reduced distractions, while others may struggle with the lack of social interaction and support (Lunde et al., 2022). Personal factors such as personality traits, home environment, and social support systems play a significant role in determining how teleworking impacts psychological well-being (Baigiu & Simionescu-Panait, 2021).

Job-related factors, such as the nature of work, job demands, and organizational support, also influence the relationship between teleworking and psychological well-being. Employees with high job demands may experience increased stress and pressure when teleworking, while those with supportive organizational cultures and clear communication channels may benefit from enhanced well-being (Catană et al., 2022). Organizations

must provide adequate resources and support to ensure teleworking employees can perform their duties effectively without compromising their well-being.

The insights gained from studying teleworking and psychological well-being are particularly relevant to the TVET sector. TVET institutions can leverage teleworking to offer flexible learning and working arrangements, enabling students and staff to balance their educational and professional commitments. By adopting teleworking practices, TVET institutions can enhance the well-being of their stakeholders, leading to improved performance and satisfaction (Catană et al., 2022). Moreover, understanding the determinants of psychological well-being in a teleworking context can help TVET institutions develop strategies to support their students and staff. For example, providing resources for mental health support, fostering virtual collaboration, and promoting work-life balance can contribute to a positive and productive learning environment (Burns, 2016).

3. Methodology

The research adopted a quantitative approach using online survey questionnaires to examine the relationship between teleworking determinants and employee psychological well-being among employees in a government-linked company as a case study. The survey questionnaire comprises five sections to comprehensively capture factors impacting teleworking employees' psychological well-being. Section A collects demographic information with five items, including gender, age, marital status, number of children, and current post. Section B evaluates psychological well-being with six items, such as adaptability, decision-making, and flexibility compared to office work. Section C delves into personal factors with 14 items, divided into self-determination (6 items), dispositional tendency (4 items), and work-life balance (4 items). Section D addresses time-related factors with four items focused on flexibility in work scheduling. Finally, Section E examines work environment factors with eight items, covering comfort with home workspace, equipment suitability, and technology efficiency. Each section uses a 1 (Strongly Disagree) to 5 (Strongly Agree) scale to measure participants' agreement.

A convenient sampling method was used to select participants from a government-linked company, chosen for its employees' experience with both office-based and remote work, making it ideal for studying teleworking's effects on psychological well-being. Questionnaires were distributed to 400 workers, with 107 responses received. The study focused on employees in Kuala Lumpur, with inclusion criteria requiring participants to be 20 years or older and have teleworking experience. This ensures participants possess the maturity and professional experience necessary to manage teleworking challenges. Employees with prior teleworking experience provide valuable insights into its impact on psychological well-being. The targeted sample size of 400 aimed to ensure diversity and representation, and the 107 responses were adequate for statistical analysis. According to Saunders, Lewis, and Thornhill (2019), a sample size of at least 100 is generally sufficient for detecting significant effects in social science research. The respondents represented various job roles and industries, enhancing the findings' applicability. Despite practical constraints like time and budget, achieving a 25-30% response rate is typical and manageable for in-depth analysis. Similar studies, such as those by Baruch and Holtom (2008) and Salleh et al. (2023), have drawn reliable conclusions from comparable sample sizes, validating this study's outcomes on teleworking and psychological well-being.

The conceptual framework for this research is designed to identify the determinants of teleworking that impact employee psychological well-being. The framework includes independent variables such as teleworking determinants (personal, time-related, work environment, and job-related factors) and the dependent variable, which is employee psychological well-being. This framework is visualized in Fig.1, depicting the hypothesized relationships between these variables. The research framework (Fig. 1) includes four major themes impacting employees' psychological well-being during telework, i.e., personal factors, time-related factors, work environment, and job-related factors. The themes were identified and defined based on pertinent past literature.

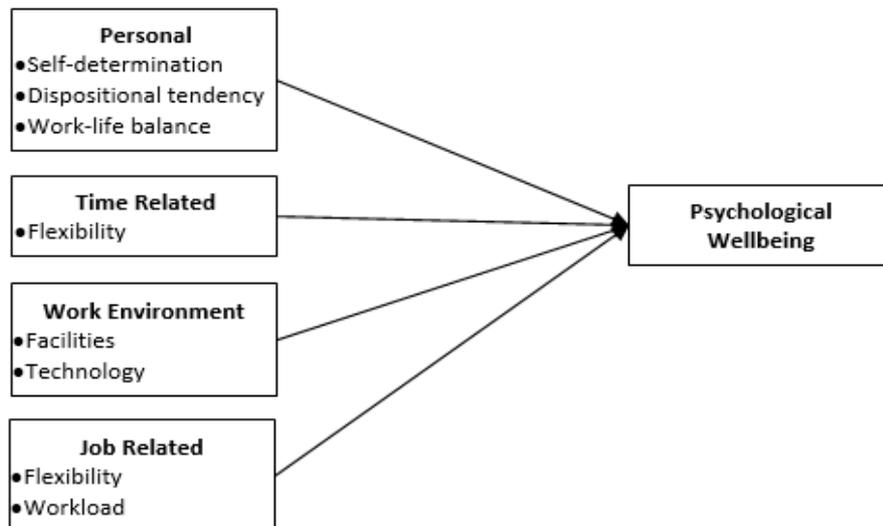


Fig. 1 *The research framework*

Personal factors impacting employees' psychological well-being (PWB) while working from home (WFH) include self-determination, dispositional tendency, and work-life balance (WLB). Self-determination, which encompasses autonomy, relatedness, and competence, is critical. Schade et al. (2021) found that WFH reduces relatedness to coworkers but maintains autonomy and competence. Employees with high emotional stability and autonomy experience less strain, while those with low emotional stability and high autonomy are more vulnerable (Perry, Rubino, and Hunter, 2018). Proactive personalities and leisure activities can mitigate emotional exhaustion (Abdel Hadi et al., 2021). However, the overlap between work and personal life, especially during COVID-19, has increased psychological distress and work-family juggling (Palumbo, 2020; Pluut and Wonders, 2020).

Time-related factors include flexibility and working hours. Flexibility in telework can improve WLB by allowing employees to manage non-market and market work effectively (Giménez-Nadal, Molina, and Velilla, 2020). Organizational support for flexible schedules positively affects emotions, performance, and commitment (Lee, 2021; Lokman et al., 2019). However, flexibility does not always correlate with reduced depressive symptoms or work-family conflict (Shepherd-Banigan et al., 2016; Ongaki, 2020). Time pressure and blurred work-life boundaries can lead to extended working hours and increased stress (Chiguvu et al., 2023; Palumbo, 2020).

The work environment impacts PWB through the availability of facilities, people, and technology. Suitable home environments and necessary supplies are crucial for productivity (Mulugeta et al., 2021). Blurred boundaries between home and workspaces, poor communication, and lack of human interaction can negatively affect well-being (Chiguvu et al., 2023; Weerasekara & Sumanasiri, 2022). Technology plays a dual role, improving communication but also contributing to fatigue and decreased happiness (Lee & Joseph, 2019; Bennett et al., 2021).

Job-related factors include job demand and workload. Job satisfaction influences psychological health, but high demands and lack of structure can lead to emotional exhaustion (Abdel Hadi et al., 2021; Subha B., Madhusudhanan, and Thomas, 2021). Task setbacks, especially during COVID-19, can increase stress and depression, particularly for those with high task interdependence (Chong, Huang, and Chang, 2020; Shepherd-Banigan et al., 2016).

The study investigated the complex interplay between telework and employee well-being, emphasizing the need for strategies to mitigate negative impacts and enhance positive outcomes. The questionnaire was developed based on the research framework, focusing on key variables influencing psychological well-being in teleworking: personal factors (self-determination, dispositional tendency), time-related factors, work environment factors (facilities and technology), and job-related factors (work-life balance). It comprises five sections: demographic background, psychological well-being, personal factors, time-related factors, and work environment factors. Each section systematically captures relevant data to identify and analyze the determinants of psychological well-being, enabling a thorough examination of their relationships. This structured approach supports the study's objectives, ensuring comprehensive data collection to validate the proposed conceptual model and provide actionable insights for enhancing teleworking practices, particularly within the TVET context.

4. Results and Discussion

This section will discuss, analyze and produce results based on the data obtained from a survey questionnaire that has been distributed and collected from 107 participants. The purpose of the study is to produce a conceptual model of teleworking determinants and employee psychological well-being. This section includes information regarding the demographic background of the participants, psychological well-being as the dependent variable and the teleworking determinants as the independent variable.

4.1 Demographic Background

In order to classify the group of participants based on their demographic background, the analysis of the participant's background was collected based on various aspects such as gender, age, marital status, number of children and current post.

The participant in this study includes 107 employees from various types of departments in a government linked company. Based on Table 1, most of the employees holds the position of executives (65.4%) which mostly consist of female (51.4%) and male (48.6%), (34.6%) holds the non-executive position. Majority of the employees were categorized as middle aged within 31- 40 (45.8%) age group, followed by 20 – 30 years old (28.0%), 41 – 50 years old (21.5%) and lastly age within 51 – 60 (4.7%). Most of the employees hold married marital status (60.7%), followed by single (39%) and divorced (2.8%). An equal number of number of children which are none and 1-3 children (45.8%), another group of employees with 4 – 6 children (8.4%). Therefore, this demographic background will show the data from the participants who mostly hold the position of executives, which are the majority that experience teleworking.

Table 1 Participant's demographic background

Demographic Background		Frequency	Percentage (%)
Gender	Male	52	48.6
	Female	55	51.4
Age (years)	20-30	30	28.0
	31-40	49	45.8
	41-50	23	21.5
	51-60	5	4.7
Marital Status	Single	39	36.4
	Married	65	60.7
	Divorced	3	2.8
	None	49	45.8
Number of Children	1-3	49	45.8
	4-6	9	8.4
	>6	0	0.0
Current Post	Executive	70	65.4
	Non-executive	37	34.6

4.2 Data Normality

For 107 total of participants, the data normality for each dimension's scores have been analyzed by using Kolmogorov-Smirnov test method. This is because, Kolmogorov-Smirnov test needs sample size at least 50. With the total of 107 participants, Kolmogorov-Smirnov would be sufficient for the data analysis. Kolmogorov-Smirnov test method intends to detect sample size in a population if the data is normally spread or does not normally spread.

Table 2 Tests of normality (Kolmogorov-Smirnov)

	Statistics	Df	Sig. (P-Value)
Psychological Wellbeing	.140	107	<.001
Self Determination	.098	107	.014
Dispositional Tendency	.115	107	.001
Work-life Balance	.124	107	<.001
Flexibility	.103	107	.007
Facilities	.121	107	<.001
Technology	.143	107	<.001
Job Demands	.113	107	.002
Workload	.147	107	<.001

Based on Table 2, the significance of P-value for each dimension have been determined as P-value < 0.05. Null hypothesis needs to be rejected. Thus, all dimensions mentioned in Table 2 are not normally distributed.

4.3 Analysing The Relationship Between Teleworking Determinants and Employee Psychological Well-Being

The relationship between teleworking determinants and employee psychological well-being has been determined by using Spearman correlation analysis which is a non-parametric method. This method of analysis been chosen due to all determinants are not normal. The result can be seen in Table 3. The threshold used for determining the strength of variable relationships is based on commonly accepted statistical conventions. According to Cohen (1988), a correlation coefficient (r) greater than 0.7 indicates a strong relationship between variables. This high correlation suggests a significant level of association, meaning changes in one variable are closely linked to changes in the other. A moderate relationship is indicated by an r value between 0.3 and 0.7. This range suggests a noticeable but not overwhelming association between variables, where changes in one variable somewhat affect the other but are also influenced by other factors. A weak relationship is indicated by an r value of 0.3 or less. This low correlation suggests minimal association between the variables, implying that changes in one variable have little to no predictable effect on the other. These thresholds are followed to provide a clear interpretation on the strength of relationships in the data, ensuring consistent and accurate analysis.

As shown in Table 3, all determinants for sample participants in this research study are having significant positive correlation with psychological well-being. From all determinants, it is shown that self-determination, dispositional tendency, work-life balance and technology have moderate direct or positive relationship with psychological well-being. Among the top four determinants, based on the coefficient correlation value the most related determinants are dispositional tendency followed by self-determination, technology and then work-life balance. The larger the value of coefficient, the stronger is the relationship. Whereas others such as flexibility, facilities, job demands and workload show having weak positive relationship.

Table 3 Spearman correlation analysis

		Psychological Well-Being	Self Determination	Dispositional Tendency	Work-life Balance	Flexibility	Facilities	Technology	Job Demands	Workload
Psychological Well-Being	Correlation	1.000	.645**	.652**	.537**	.475**	.444**	.596**	.294**	.174
	Coefficient									
	Sig (2-tailed)	.	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	.073
	N	107	107	107	107	107	107	107	107	107
Self Determination	Correlation	.645**	1.000	.677**	.502**	.602**	.448**	.758**	.242**	.160
	Coefficient									
	Sig (2-tailed)	<.001		<.001	<.001	<.001	<.001	<.001	<.001	.100
	N	107	107	107	107	107	107	107	107	107
Dispositional Tendency	Correlation	.652**	.677**	1.000	.610**	.497**	.574**	.652**	.251**	.61
	Coefficient									
	Sig (2-tailed)	<.001	<.001	.	<.001	<.001	<.001	<.001	<.001	.098
	N	107	107	107	107	107	107	107	107	107
Work-life Balance	Correlation	.537**	.502**	.610**	1.000	.523**	.554*	.535**	.153	.048
	Coefficient									
	Sig (2-tailed)	<.001	<.001	<.001	.	<.001	<.001	<.001	.116	.625
	N	107	107	107	107	107	107	107	107	107
Flexibility	Correlation	.475**	.602**	.497**	.523**	1.000	.362**	.601**	.226**	.173**
	Coefficient									
	Sig (2-tailed)	<.001	<.001	<.001	<.001	.	<.001	<.001	.020	.075
	N	107	107	107	107	107	107	107	107	107
Facilities	Correlation	.444**	.448**	.574**	.554**	.362**	1.000	.490**	.265**	.322**
	Coefficient									
	Sig (2-tailed)	<.001	<.001	<.001	<.001	<.001	.	<.001	.006	<0.001
	N	107	107	107	107	107	107	107	107	107
Technology	Correlation	.596**	.758**	.652**	.535**	.601**	.490**	1.000	.314**	.229**
	Coefficient									
	Sig (2-tailed)	<.001	<.001	<.001	<.001	<.001	<.001	.	<0.001	.018
	N	107	107	107	107	107	107	107	107	107
Job Demands	Correlation	.294**	.242**	.251**	.153	.226*	.265*	.314**	1.000	.625**
	Coefficient									
	Sig (2-tailed)	.002	.012	.009	.116	.020	.006	<0.001	.	<0.001
	N	107	107	107	107	107	107	107	107	107

Workload	Correlation Coefficient	.174	.160	.161	.048	.173	.322**	.229*	.625**	1.000
	Sig (2-tailed)	.073	.100	.098	.625	.075	<0.01	.018	<0.01	.

4.4 Identifying The Determinants of Psychological Well-Being Due to Teleworking

The identification of psychological well-being determinants due to teleworking during Covid-19 has been analyzed by using multiple linear regression (MLR) statistical model. Multiple linear regression is a regression model that estimates the relationship between a quantitative dependent variable with two or more independent variables. Few requirements are needed for MLR model. The dependent variable which is psychological well-being must be ratio level data. In this research, the data for psychological well-being variable is measured using the mean score values of the Likert scale response, thus the measurement are in the ratio data level. MLR is known as a model to predict average, thus the dependent variable (i.e., psychological well-being) must be normally distributed. To fulfil this condition, the outliers must be removed if there are any. Another important requirement is the independent variables must not have multicollinearity issues. The pair of independent variables must not be overlapped or interrelated.

The validity of MLR also depends on the assumption on the residuals which need to be normally distributed with zero mean and constant variance. Thus, to ensure the model validity, the obtained model must pass diagnostic checking as well as having significant results ANOVA F-test. Statistics Rsquare can be used to investigate the capability of the MLR model in describing the relationship between the independent (determinants) and dependent variables (psychological well-being). High value or Rsquare (>80%) indicates a strong capability of a MLR model to predict the dependent variable (psychological well-being).

The determinants that can be classified as significant based on the significance test using P-value. By accessing the coefficient values of the determinants and if the P-value is less than 0.05, the determinant of the independent variable is said to be significant.

4.4.1 Analysis Result Based on Multiple Linear Regression

The result has been achieved by using the Entry method of Multiple Linear Regression model. The entry method which also known as Enter method. All independent variables enter the equation at the same time. This is a good analysis when dealing with a small number of predictors or when which independent variables produce the best prediction equations. Each predictor is evaluated as if it were entered after all other independent variables have been entered and is provided to predict the dependent variable differently than the predictions made by the other variables entered in the model variable.

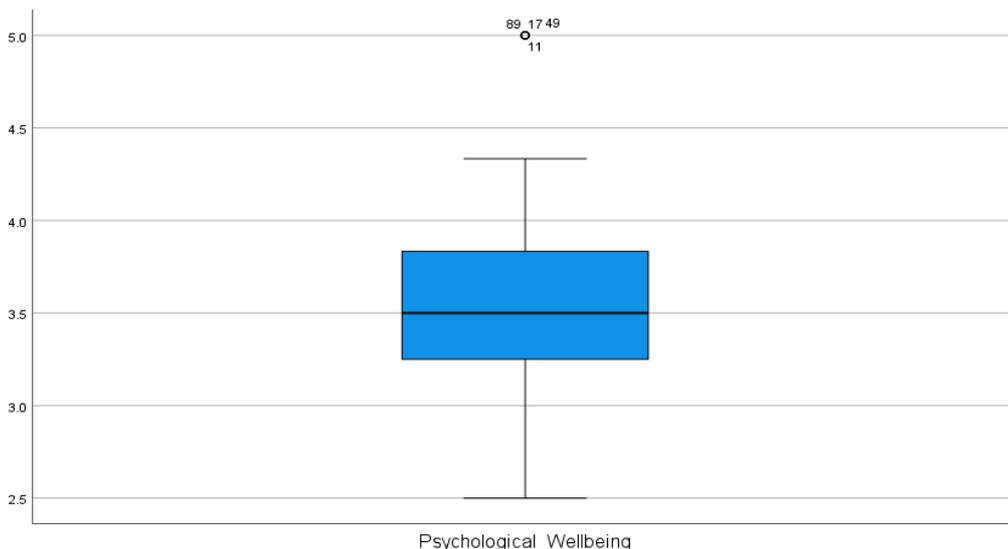


Fig. 2 Boxplot for multiple linear regression

Based on Fig. 2, four outliers have (i.e., observation 11,17,48 and 89) has been identified, thus they must be removed in psychological well-being data, reducing the data size into n=103. This is to meet the normality requirement. Outliers were the causes of skewed data. In this study, MLR model has been developed based on 90 randomly selected samples from the remaining 103 samples. This is to get rid of data autocorrelation issues that might affect the model accuracy and coefficient estimates.

Table 4 shows the random sample of n=90 from the remaining n=103 samples without the outliers in the

dependent variable (psychological well-being). The average mean score for psychological well-being is 3.6, which equals 4, when rounded to the nearest integer, indicating the employees agree to experience a positive psychological well-being.

Table 4 Table of descriptive statistics for MLR model

	Mean	Std. Deviation	N
Psychological Well-Being	3.6000	.47720	90
Self Determination	3.6389	.49859	90
Dispositional Tendency	3.6083	.68496	90
Work-life balance	3.5194	.73937	90
Flexibility	3.6472	.63145	90
Facilities	3.4778	.69574	90
Technology	3.7444	.64147	90
Job demands	3.3556	.67663	90
Workload	3.3167	.63023	90

Fig. 3 shows the result of the MLR model's diagnostic checking on the residuals assumption. Both normality assumption and the constant variance are met. As shown in Fig. 3, the p-p plots do not depart from the straight line, positive indication of normally distributed residuals. The random pattern of residual plots in Fig. 3 shows that the residual of the multiple linear regression model has constant variance. At 5% significance level, the ANOVA F-test to test whether the data can be represented by MLR model also found significant with p-value < 0.05.

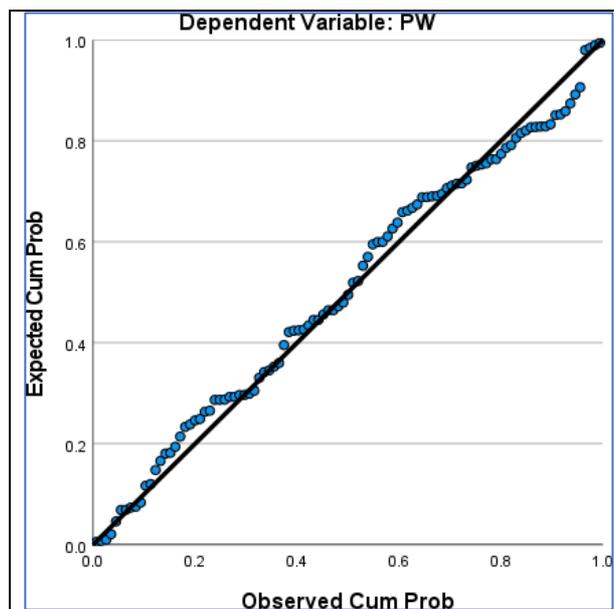


Fig. 3 P-P plot of regression standardized residual

Table 5 Model validity

Model	Sum of squares	Df	Mean Square	F	Sig.
Regression	10.641	8	1.330	11.192	<.001 ^b
Residual	9.626	81	.119		
Total	20.267	89			

Other than that, based on Table 5, the model is also evidenced by not having multicollinearity issue since all VIF values are less than 10. In conclusion, the obtained model from multiple linear regression is valid since it passes the residuals assumption.

Based on the p-values shown as Sig. given in Table 6, self-determination has 0.021 significant value, dispositional tendency has 0.207 significant value, work-life balance has 0.310 significant value, flexibility has 0.434 significant value, facilities have 0.285 significant value, technology has 0.446 significant value, job demands has 0.443 significant value and lastly workload has 0.921 significant value. At 5% significance level, only self-

determination is proven to be the significant determinant to psychological well-being. This is because the significant value for self-determination is $0.021 < 0.05$, while others such as dispositional tendency, work-life balance, flexibility, facilities, technology, job demands, and workload has significant value > 0.05 . In conclusion, there is only one significant to psychological well-being which is self-determination and five others such as dispositional tendency, work-life balance, flexibility, facilities, technology, job demands, and workload is not significant. Based on the p-value in Table 6, 5% significance level, only self-determination is significant determinant to psychological well-being. Where another determinant is not significant. Other than that, the model is also evidenced by not having multicollinearity issue since all VIF values are less than 10. In conclusion, the obtained model from multiple linear regression is valid since it passes the residuals assumption.

Table 6 Table of multiple linear regression model equation

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	.927	.324		2.863	.005		
Self determination	.261	.111	.272	2.354	.021	.438	2.283
Dispositional tendency	.112	.088	.161	1.272	.207	.365	2.740
Work-life balance	.077	.076	.119	1.021	.310	.428	2.335
Flexibility	.065	.082	.086	.787	.434	.495	2.019
Facilities	.085	.079	.124	1.077	.285	.440	2.274
Technology	.071	.092	.095	.766	.446	.380	2.633

4.5 Model for Teleworking Determinants and Employee Psychological Well-Being

Based on data analysis from collected questionnaires and the MLR model equation, self-determination was shown to be a significant determinant of psychological well-being. A conceptual model was then developed, highlighting four determinants positively correlated with psychological well-being and one highly significant determinant; self-determination (significant value $0.021 < 0.05$). The correlation coefficients are as shown in Fig. 3: dispositional tendency (0.652), self-determination (0.645), technology (0.596), and work-life balance (0.537).

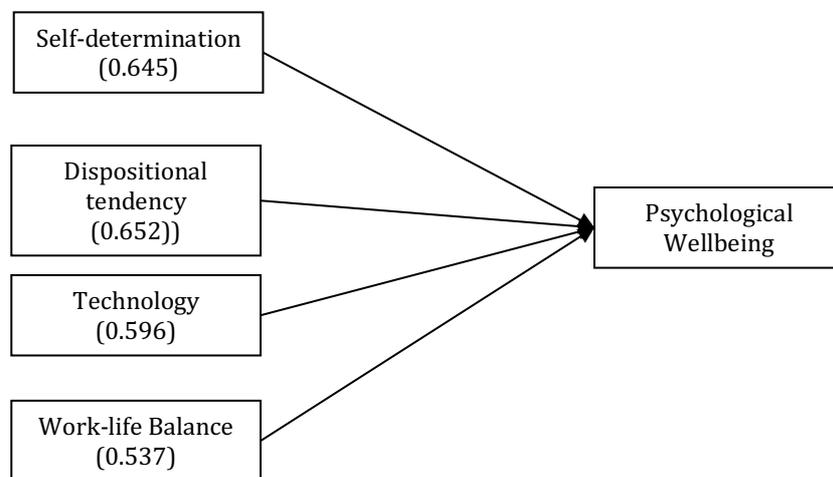


Fig. 3 Teleworking determinants and psychological well-being

Dispositional tendencies, such as emotional stability and proactivity, play a critical role. Employees with positive tendencies handle stress and emotional exhaustion more effectively, reducing psychological distress. Proactive individuals, in particular, mitigate emotional exhaustion by engaging in leisure activities. Abdel Hadi et al. (2021) emphasized the importance of supporting employees' personal development and hobbies to enhance well-being.

Self-determination significantly influences psychological well-being by encompassing autonomy, competence, and relatedness. High levels of self-determination lead to greater motivation and job satisfaction, enhancing overall well-being. Employees with high self-determination are more resilient and experience less strain, which helps maintain a balance between personal and professional life. Schade et al. (2021) found that working from home reduces relatedness but maintains autonomy and competence, suggesting a focus on these aspects to boost employee well-being.

Technology has a dual impact. While it enhances communication and collaboration, it can also cause fatigue and decreased happiness if not managed properly. Proper use of technology improves productivity and job satisfaction, but organizations must address the negative aspects like over-reliance and digital fatigue. Bennett et al. (2021) noted that technology, though beneficial for communication, contributes to fatigue, highlighting the need for balanced use and breaks to prevent burnout.

Work-life balance is crucial for psychological well-being. Poor balance leads to stress and burnout, whereas a good balance enhances job satisfaction and overall well-being. Flexibility in work arrangements helps employees manage responsibilities effectively, reducing stress. Giménez-Nadal et al. (2020) found that flexibility in telework improves work-life balance, allowing better management of work and personal lives.

These factors are supported by Self-determination theory (Deci & Ryan, 2000) in emphasizing autonomy, competence, and relatedness for fostering well-being, the Job Demands-Resources model (Demerouti et al., 2001) which highlights personal resources like dispositional tendencies in managing job demands and enhancing well-being, and the Technology Acceptance Model (Davis, 1989) which suggests perceived ease of use and usefulness of technology impact employee satisfaction and well-being.

The four determinants (self-determination, dispositional tendency, technology, and work-life balance) are interconnected and crucial for psychological well-being. Self-determination provides intrinsic motivation and control, dispositional tendencies help cope with stress, technology boosts productivity if managed well, and work-life balance prevents burnout. Focusing on these determinants helps organizations create a supportive environment, leading to higher productivity, job satisfaction, and overall success.

5. Conclusion

This research study aimed to develop a conceptual model to explore the determinants of teleworking and their impact on employees' psychological well-being. The primary objective of this research was to analyze the relationship between teleworking determinants and psychological well-being and to identify the key determinants affecting well-being. The study successfully met these objectives, revealing that dispositional tendency, self-determination, and work-life balance are positively correlated with psychological well-being, with self-determination being the most influential factor.

The developed conceptual model highlights self-determination as the most significant determinant of psychological well-being, with dispositional tendency, technology, and work-life balance also showing positive correlations. This model provides a foundation for employees experiencing teleworking to develop strategies to maintain or improve their psychological well-being. For instance, if employees experience disturbances in their health or well-being, they can refer to these determinants and implement strategies to enhance their self-determination, thereby improving their overall well-being.

Nevertheless, this research is not without limitations. Since it was done with a limited sample size and focus on a single organization, the findings may vary with a larger and more diverse sample. Additionally, the developed model explains only 52.5% of the variation in psychological well-being, indicating other factors may influence well-being that were not identified in this study.

The findings from this study align with the existing literature on the impact of teleworking on psychological well-being. Catanã et al. (2022) emphasized that employees with higher well-being demonstrate better job performance and productivity. The current study supports this by identifying self-determination as a critical factor, suggesting that enhancing employees' ability to self-manage can lead to improved well-being and performance. The emphasis on dispositional tendency and work-life balance aligns with previous research highlighting the importance of these factors in maintaining psychological well-being (Tesi et al., 2019). Teleworking can blur the boundaries between work and personal life, making it essential for employees to manage their work-life balance effectively to prevent stress and burnout. Additionally, the positive correlation between technology proficiency and psychological well-being supports the notion that access to and effective use of technology can facilitate better teleworking experiences, as suggested by previous studies (Pace et al., 2021). This underscores the need for organizations to provide adequate technological support to employees working remotely.

The findings are also significant for organizations practicing teleworking. By recognizing the importance of self-determination, dispositional tendency, and work-life balance, organizations can implement strategies to enhance these factors, thereby improving employee well-being. This research also holds relevance for Technical and Vocational Education and Training (TVET) institutions, where teleworking is becoming more common. TVET programs can be tailored to enhance trainees' self-determination and work-life balance, preparing them for the challenges of remote work.

The research contributes to the growing body of knowledge on teleworking and psychological well-being, providing practical implications for organizations and employees. By focusing on enhancing self-determination, managing dispositional tendencies, ensuring work-life balance, and leveraging technology, organizations can foster a supportive teleworking environment that promotes employees' psychological well-being.

Future research should explore the long-term effects of teleworking on psychological well-being across different industries and cultural contexts. Investigating the role of organizational support in enhancing self-determination and resilience among teleworkers can provide deeper insights. Additionally, examining the impact of emerging technologies, such as virtual reality and AI, on remote work dynamics and well-being can offer valuable information for adapting to future work environments. Researchers should also consider longitudinal studies to understand the evolving nature of teleworking and its implications on employee well-being over time. Expanding the sample size and including diverse demographics can help generalize the findings and develop comprehensive strategies for fostering psychological well-being in teleworking across various sectors, including TVET institutions.

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Conflict of Interest

Authors declare that there is no conflict of interests regarding the publication of the paper.

Author Contribution

Anitawati Mohd Lokman contributed the **overall concept, the writing, and the editing** of the paper. Natasha Zainal provided **resources, administered the data management, and writing the project report**. Saidatul Rahah Hamidi assisted in **writing the method, analysis and discussions**. Ana Hadiana assisted in **writing the literature review**.

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