

Analysis of the Relationship between Telecommuting with Work-Life Balance and Job Satisfaction (Meta-Analysis Study)

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Abstract

This study examines and analyzes the relationship between telecommuting with work-life balance and job satisfaction. The data analysis technique used in this study is meta-analysis correlation—used to see the relationship between two variables by utilizing the results of previous correlation studies, which consist of two main components: calculating the effect size and summary effect. The number of studies used as relevant data in the study was 18 journals containing 26 statistical data used as material for data analysis. The data is processed using a statistical tool, JASP software version 0.14.1 2020. The results show that telecommuting can increase work-life balance and job satisfaction for members of the organization that runs it, as well as the work-life balance, which can create a strong relationship with job satisfaction in the context of implementing telecommuting.

Keywords: telecommuting, work-life balance, job satisfaction, meta-analysis

INTRODUCTION

Telecommuting or often called working from home (WFH) is an alternative work arrangement activity that has become increasingly popular since the World Health Organization (WHO) has declared the Covid-19 pandemic on March 9, 2020. The impact of the pandemic has caused a shift in interaction methods in an organization due to limited spaces for individual movement due to the health protocol policy regarding the prohibition of gathering in large crowds. In an effort to keep an organization's operations running, many companies employ the telecommuting methods or work remotely.

According to [1], Telecommuting allows a person to work from home when the weather is bad or because of a widespread health problem or pandemic. According [2], Telecommuting is a work practice that involves organizational members shifting part of their typical working hours to work away from the central workplace, especially at home, and using technology to interact with others as needed to perform work tasks. Referring to previous studies, telecommuting is also referred to as telework, remote work, distributed work, virtual work, flexible work, flexplace, and distance work.

Work-life balance and job satisfaction of organizational members are aspects that needs to be considered in implementing telecommuting. Several previous studies describes the results of the relationship between telecommuting with work-life balance and job satisfaction. Work-life balance is a person's ability to balance the demands of work with personal needs, ensuring that work demands matches personal life and responsibilities outside of work [3].

Previous studies explains that telecommuting is positively related to employee work-life balance [4][5][6][7][8]. Job satisfaction is a positive emotion resulting from an appraisal of one's job or work experience [1]. Previous research that describes telecommuting having a positive relationship with job satisfaction [4][8][9][10][11] [12][13][14][15].

The application of telecommuting can have a negative impact on work-life balance and job satisfaction. According to [16], revealed that the application of telecommuting can increase stress and reduce work-life balance and job satisfaction, while other research states that the relationship between telecommuting and job satisfaction is in the form of an inverted U-curve, i.e. if the intensity of telecommuting is increased to a certain limit, there will be a decrease in employee's job satisfaction, stating that work-life balance also has an influence on employee's job satisfaction in the context of implementing telecommuting [8].

The use of telecommuting on employees by an organization, allows changes in attitudes and

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behavior followed by adjustments to information technology. This study examines and analyzes the value of the statistical relationship between telecommuting with work life balance and job satisfaction from previous studies in the past 5 years (2016-2021), using metaanalysis method. The purpose of this study is to provide clearer answers to the questions wheter or not does telecomuting has a positive and significant relationship with work life balance, does telecommuting has a positive and significant relationship with job satisfaction, and does work life balance has a positive and significant relationship with job satisfaction in the context of telecommuting.

METHOD

A systematic review type of research with a quantitative synthesis method, namely meta-analysis. Meta-analysis is a quantitative research method that analyzes quantitative data from the results of previous studies to accept or reject the hypotheses proposed in these studies. The steps in the meta-analysis are finding research questions, determining the relevant research (see Table 1), coding (see Table 2), analyzing data, calculating the effect size and summary effects, and compiling reports on the analysis results.

Data analysis technique using correlation meta-analysis is used to see the relationship between two variables by utilizing the results of previous correlation studies [17]. The correlation meta-analysis consists of two main components, namely calculating the effect size and the summary effect. In addition to the effects size and summary effect, this study also conducted heterogeneity tests, where there are two heterogeneity test models, which are the fixed effect model and the random effect model, aimed to test whether the effect size of each study used in the correlation meta-analysis is the same or not different. In calculating the effect size of each study, the primary statistical value used in this study is the value of the correlation coefficient (*r*). If, in a study, the reported values are (*F*) and (*t*), then both values can be transformed to (*r*) through the following equation:

$$F = t^2$$

$$t = \sqrt{F}$$

$$r = \frac{t}{\sqrt{t^2 + N - 2}}$$

In this case (*r*) must be transformed first to Fisher (*z*). To convert (*r*) to (*z*) we can use the following equation [17]:

$$z = Y_i = 0,5 \times \ln \frac{1+r}{1-r}$$

(*z*) or (*Y_i*) is the effect size that has been transformed. In several other literatures, the effect size is also denoted by ES. Furthermore, the variance of (*V_z*) and standard error (*SE_z*) is calculated using the following equation:

$$V_z = V_{Y_i} = \frac{1}{n-3}$$

and

$$SE_z = SE_{Y_i} = \sqrt{V_z}$$

The first process of data analysis is to find the effect size (*z*=ES) of each study, researchers use Microsoft Excel as a statistical data processing, including looking for variance (*V_z*) and standard error (*SE_z*) of each study, while statistical analysis is to test the heterogeneity effect size and calculate the summary effect or average effect size in this study using JASP software version 0.14.1 2020.

Table 1. Data inclusion and exclusion

Criteria	Inclusion	Exclusion
Population	Articles that are accessed online on the library database of Universitas Brawijaya (Proquest, Emerald, Wiley, Science Direct) and Sage Publishing	Articles that are accessed online outside the library database of Universitas Brawijaya, except Sage Publishing
Year of Publication	Post – 2016	Pre - 2016
Research Relevance	Main topic of this reasearch is telecommuting / telework / work from home / virtual work / flexible work arrangement	
Method	Survey, Cross-sectional, comparrasion studi	Experimental
Results	Articles that include the statistical value of the correlation coefficient (<i>r</i>), F-test, or t test on the relationship between three research variables: telecommuting, work life balance and job satisfaction	Articles that do not include statistical correlation coefficient (<i>r</i>), F test, t test, on the relationship between three research variables: telecommuting, work life balance, and job satisfaction

Source: Data processed, 2021

Table 2. Search results and data selection

Database	Search Results	Data Selection	Total statistical data
Proquest	54	8	14
Emerald	117	5	5
Science Direct	102	1	1
Wiley	80	1	1
Sage	93	3	5
Total	446	18	26

Source: Data processed, 2021

Calculating Effect Size

Based on the analysis of data from the search results and data selection that has been carried out, there are 7 statistical data (see Table 3) which are used for further analysis in hypotheses 1, which is related to the relationship between telecommuting and work-life balance, consisting of 6 studies that includes the value of the correlation coefficient (*r*) and 1 study that included a (*t*) value.

Table 3. z=ES,Vz,SEz of hypotheses 1 data

Study	<i>t</i>	<i>r</i>	$\frac{z=E}{S}$	Vz	SEz
Rawashdeh et al (2016)		0,82	1,15	0,0	0,1
Gunasekara V.M (2018)		0,37	0,39	0,0	0,0
Jackson and Fransman (2018)		0,05	0,05	0,0	0,0
Khairudin and Aziz (2020)		0,31	0,33	0,0	0,1
		-	-		
Palumbo R (2020)		0,23	0,23	0,0	0,0
	7,6	0,20	0,21	0,0	0,0
Reyes et al (2021)	24	8	1	01	28
Qiu and Dauth (2021)		0,12	0,12	0,0	0,0
		3	4	03	57

Source: Data processed, 2021

There are 15 statistical data (see Table 8) that are used for further analysis in the second hypotheses, which is related to the relationship between telecommuting and job satisfaction, which consists of 1 study listing the value (*F*), 1 study listing the value (*t*) and 13 studies containing include the value of the correlation coefficient (*r*).

There are 4 studies (see Table 4) that presents data from statistical analysis with the value of the correlation coefficient (*r*) that is used for the further analysis process in the third hypotheses, which is related to the relationship

between work life balance and job satisfaction, in the context of implementing telecommuting.

Table 4. z=ES,Vz,SEz of hypotheses 3 data

Study	<i>r</i>	z=ES	Vz	SEz
Rawashdeh et al (2016)	0,460	0,497	0,011	0,104
Jackson andFransman (2018)	0,360	0,377	0,004	0,063
Reyes dkk (2021)	0,356	0,372	0,001	0,028
Qiu andDauth (2021)	0,795	1,085	0,003	0,057

Source: Data processed, 2021

Test of Heterogeneity

1) Test of heterogeneity on the relevant data used in hypotheses 1

The results of the analysis shows that the 7 effect sizes analyzed were heterogeneous ($Q=509.293;p<0.001$) (see Table 5). Thus, the random effects model is more suitable to be used to estimate the summary effect on the relevant data used in hypotheses 1.

Table 5. Heterogeneity test result of the relevant data used in hypotheses 1

Fixed and Random Effects			
	Q	df	p
Omnibus test of Model Coefficients	3.022	1	0.082
Test of Residual Heterogeneity	509.293	6	< .001

Note. *p*-values are approximate.

Source: Data processed, 2021

2) Test of heterogeneity on the relevant data used in hypotheses 2

The results of the analysis shows that the 15 effect sizes (see Table 6) analyzed are heterogeneous ($Q=211.128;p<0.001$), thus, the random effects model is more suitable to be used to estimate the summary effect of the relevant data used in hypotheses 2.

Table 6. Heterogeneity test result of the relevant data used in hypotheses 2

Fixed and Random Effects			
	Q	df	p
Omnibus test of Model Coefficients	13.997	1	< .001
Test of Residual-Heterogeneity	211.128	14	< .001

Note. *p*-values are approximate.

Source: Data processed, 2021

3) Test of heterogeneity on the relevant data used in hypotheses 3. The results of the analysis shows that the 4 effect sizes (see Table 7) analyzed were heterogeneous ($Q=128.166; p<0.001$). Thus, the random effect model is more suitable to be used to estimate the Summary effect of the relevant data used in hypotheses 3. Based on results of the heterogeneity test on the data used in each hypotheses, the random effect model is more suitable to used to estimate the summary effect.

Table 7. Heterogeneity test result of the relevant data used in hypotheses 3

Fixed and Random Effects			
	Q	df	p
Omnibus test of Model Coefficients	12.312	1	<.001
Test of Residual Heterogeneity	128.166	3	<.001

Note. *p*-values are approximate.

Source: Data processed, 2021

Table 8. $z=ES, Vz, SEz$ of hypotheses 2 data

Study	F	T	r	z= ES	Vz	SEz
Rawashdeh <i>et al</i> (2016)			0,510	0,563	0,011	0,104
Bae and Kim (2016)			0,180	0,182	0,000	0,002
Caillier (2017)			-0,060	-0,060	0,004	0,065
Chen and Fulmer (2017)			0,140	0,141	0,000	0,007
Jackson and Fransman (2018)			0,060	0,060	0,004	0,063
Nakrosiene dkk (2019)			0,400	0,424	0,008	0,089
Shanmugam and Agarwal (2019)			0,676	0,822	0,005	0,071
Zafari dkk (2019)			-0,030	-0,030	0,002	0,046
Awotoye dkk (2020)			0,172	0,174	0,007	0,082
Feng and Savani (2020)	7,510	2,740	0,161	0,162	0,004	0,059
Brunelle and Fontin (2021)			0,243	0,248	0,005	0,069
Kuruzovich dkk (2021)			0,020	0,020	0,006	0,074
Reyes dkk (2021)		6,599	0,181	0,183	0,001	0,028
Jung and Yoon (2021)			0,477	0,519	0,004	0,060
Qiu and Dauth (2021)			0,133	0,134	0,003	0,057

Source: Data processed, 2021

RESULTS AND DISCUSSION

Summary Effect

This study uses a summary effect analysis of the random-effect model based on the results of the effect size heterogeneity test that has been carried out Tabel 9. The random effect model is used when the study population being analyzed is functionally different due to the treatment carried out by several people [17]. The results of the correlation between variables are known from the value of the estimate summary effect (rRE), if the value of $r \leq 0.10$ then the correlation is in the "weak" category, if $r = 0.25$ then the correlation is in the "medium" category, whereas if $r \geq 0.40$ then the correlation is in the "strong" category [17].

1) Relationship between Telecommuting and Work-Life Balance

The results of the meta-analysis of correlations in the relationship between telecommuting and work-life balance on 7 statistical data from relevant studies showed that the positive correlation value was not significant ($k=7; rRE=0.283; p>0.001=0.083; CI=95\% [-0.036; 0.603]$) (see table 9), whereas the correlation value between the two variables are in the medium category ($rRE=0.283 > r=0,25$). The results of the meta-analysis shows that hypotheses 1 in this study (telecommuting is positively and significantly correlated with work life balance) is not supported. The results of this meta-analysis supports 2 of the 7 previous studies as relevant data used, namely research from [6] ($r=0.06; p>0.01$) and [8] ($r=0.123; p>0.01$), although the correlation value of the

two variables is positive and not significant, it means that the implementation that telecommuting can improve work life balance for organizational members who carry out telecommuting with certain limitations or factors that can affect the work life balance of organizational members who carry it out.

2) Relationship between Telecommuting and Job Satisfaction

The results of the meta-analysis of correlations on the relationship between telecommuting and job satisfaction on 15 statistical data of relevant studies used, showed a positive and significant correlation value ($k=15$; $rRE=0.238$; $p<0.001$; $CI=95\% [0.110;0.353]$) (see table 9), where the correlation value between

telecommuting and job satisfaction is in the weak category* ($rRE=0.238>r=0,25$). The results of the meta-analysis indicates that hypotheses 2 in this study (telecommuting is positively and significantly correlated with job satisfaction) is supported, and the results of this study also support 9 of 15 previous studies as relevant data used, namely researches from [4] ($r=0.51;p<0.01$), [9] ($r=0.180;p<0.01$), [10] ($r=0.140;p<0.01$), [11] ($r=0.40;p<0.05$), [12] ($r=0.172;p<0.05$), [13] ($F =7.51;r=0,161;p<0.01$), [14] ($r=0.245,p<0.001$), then [15] ($r=0.477$), [18] ($r=0.676;p<0.01$). These findings indicates that the application of telecommuting can increase the job satisfaction of organizational members.

Table 9. Summary effect of relevant data used in each hypotheses

Hipotesis	k	N	r _{RE}	SE	z	p	95% Confidence Interval		results
							L	U	
Telecommuting - Work Life Balance	7	12.077	0,283	0,163	1,738	$p>0,001$ (0,082)	-0,036	0,603	Not Supported
Telecommuting - Job Satisfaction	15	216.558	0,238	0,062	3,741	$p<0,001$	0,110	0,353	Supported
Work Life Balance - Job Satisfaction	4	1.940	0,592	0,169	3,509	$p<0,001$	0,261	0,923	Supported

Source: Data processed, 2021

3) Relationship between Work Life Balance and Job Satisfaction

The results of the meta-analysis showed that a positive and significant correlation was found in the relationship between work-life balance and job satisfaction in the context of implementing telecommuting ($k=4$; $rRE=0.592$; $p<0.001$; $CI=95\% [0.261;0.923]$) (see table 9), with the correlation value in the strong category ($rRE=0.592\geq r\geq 0.40$). The results of the meta-analysis indicates that hypotheses 2 in this study (work life balance is positively and significantly correlated with job satisfaction) is supported. The findings in this study strengthens 4 previous studies, where there are positive and significant statistical values in the correlation of the two variables, namely research from [4] ($r=0.46;p<0.01$), [6] ($r=0.36;p=0.01$), [8] ($r=0.795;p<0, 01$), and [16] ($r=0.356;p<0.05$). The results of this study indicates that in the context of implementing telecommuting, employee’s work-life balance is closely related to employee’s job satisfaction.

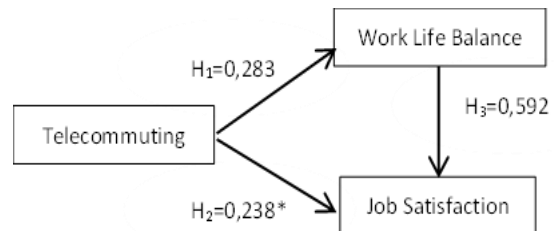


Figure 1. Research Hypotheses and Results of Meta-Analysis of Correlation Coefficients

CONCLUSION

The conclusions that can be drawn from the results and discussion in the previous section are as follows:

- 1) The results of the meta-correlation analysis showed that there was an insignificant positive correlation value in the moderate category ($rRE = 0.283$; $p > 0.001 = 0.083$) in the relationship between telecommuting and work-life balance, meaning that the application of telecommuting can improve work-life balance by considering the factors

which affects the effectiveness of its implementation.

- 2) The results of the meta-correlation analysis showed that there is a significant positive correlation value with a low category correlation value ($rRE= 0.283$; $p> 0.001 = 0.083$) on the relationship between telecommuting and job satisfaction, meaning that the application of telecommuting can increase the job satisfaction of organizational members.
- 3) The results of the meta-correlation analysis showed that there is a positive and significant correlation value with a strong category correlation value ($rRE=0.592$; $p<0.001$) on the relationship between work life balance and job satisfaction, in the context of implementing telecommuting, meaning that work-balance has a strong influence on job satisfaction.

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