

IMPACT OF REMOTE WORK ON JOB PERFORMANCE WITH MEDIATION OF JOB SATISFACTION AND MODERATION OF INFORMATION AND COMMUNICATION TECHNOLOGY (ICT)

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Abstract

With the effect of the global COVID-19 pandemic affecting all worldwide businesses traveling, and individuals' lives generally, remote working has just become very popular to keep businesses running and ensure employment of workers. The main research question addresses the mediation of job satisfaction to remote work and job performance while ICT is moderating remote work and job satisfaction during COVID-19. This quantitative study is purposefully conducted to understand how job satisfaction impacts job performance in remote working with the use of ICT. This study is mainly applicable to all those workers who were shifted to remote working. Four scales were used in this research study, Teleworkers' Experience Questionnaire, Satisfaction with Work Scale, Satisfaction and Performance and use of ICT during remote working, along with demographics in the survey to know their experience of remote working. Five hypotheses were tested and a sample of 385 respondents was used. The variable of job satisfaction mediates job performance and remote working while the use of ICT moderates remote working and job satisfaction. The theoretical and practical implications were discussed alongside the limitations of the study and future research opportunities.

Keywords: Employment, Pandemic, Remote Working

1. Introduction

World was surprised by a new syndrome or virus while entering in 2020 that spread throughout the world including Pakistan, due to globalization is called as COVID 19 or mostly known as corona virus. As per WHO announcement (2020) this virus can spread easily and affect badly to the world because the vaccine was not then discovered so it will be very hard to contain its spread if precautionary measures were not practiced stopping its transmission. In these circumstances many businesses must shut down their outlets temporarily due to loss of customers who were afraid of COVID 19 and government restrictions on staying at home to stop its transmission. However, to contain the further spread of this novel virus remote work (RW) option was enforced to millions of workers globally (BMC public health 2022). This COVID 19 has reshaped the economic and social activities of

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people and one of them was teleworking or working from home. RW has innovated people's lives and prevented virus spread as a solution to the problem. This is about flexibility in working via information and communication technology. This approach of work from home was inevitable but turned into compulsion due to pandemic. This specific activity of remote work continued even after the pandemic vanished from the world. In Pakistan Remote work was just forced in employees rather a choice due to Corona. Pakistan initially got affected by this novel virus on 26 Feb 2020 and after that many waves of corona virus spread. Pakistan is still facing the consequences of this calamity in the form of economic instability. Pakistan was ranked among 5 worst Asian affected countries in 2020 with almost 300,000 cases back then. In March 2020 complete lockdown was imposed to stay away from further effect of covid-19 alongside strict imposition of SOPs. Due to lockdown almost 217 million people were asked to stay in their homes. However, the lockdown affected the lives of all ages socially and economically. Initially after lockdown food and medicine supplies were allowed but economic activities were compromised badly. In May 2020 government started lifting lockdown for economic activities with almost 50% physical attendance was allowed and for the rest work from home option was started. This new proposal of remote work compelled the organizations to rethink about their modules upon them they work.

This study explains the relationship of remote work on job performance as the perceived benefits of remote work cause business to plan for remote hiring potentially that will cause an increase in already emerging trend of remote hiring (Ozmik, 2020). Additionally the relationship between stability and change in performance is studied before many times (Anggarwati et al, 2015). Furthermore, perceived previous performance influence employee perceived job productivity and work engagement (Sánchez, 2020). Furthermore, researchers predict that remote work has greater potential of spread but it will not take over the traditional office-site work environment. In this specific study, remote working is considered as a practice of task completion in which all work related activities are carried out at employee's home rather staying at office building while predominantly using ICT without face-to-face interaction (Allen et al., 2015). Without face-to-face interaction or social communication employees were transformed to digital platforms. Many platforms were used to perform remote activities such as for video conferencing Zoom, Skype and Google Meet were widely used and for file sharing secure tools as SharePoint, Drop box and Google Drive were

used (Brem et al, 2021). However, many organizations during Pandemic were not equipped with appropriate processes, policies or prerequisites that will allow employees to work remotely. With this change is working location, businesses rapidly adapted the innovated technologies and remote work policies for employees safety all over the world (Buchanan et al., 2021, Maślankowski & Wrycza, 2020, Vilendrer et al., 2020). However, when pandemic hit the world globally to define who were essential personnel for on-site work and then shift their working from professional setting to virtual setting to carry out work activities (Stoker et al., 2021). In all this discussion the question that arises that how this virtual remote setting influences perceived job performance and satisfaction using ICT. Many businesses globally were devoid of laptops or computers, remote network access, or for scientists to conduct their research outside their labs (Buchanan et al., 2021). Before Covid employees work remotely and continue their operations as a benefit from organization not a compulsion. Furthermore, an important concern was to study the shift of work environment from traditional work practice to non-traditional setting without any sort of formal planning or training to work remotely and remote working technological tethering rise in people's lives (Nevin&Schieman 2021). Employees were asked to complete their tasks productively and afterwards experts are asking how employees can efficiently maintain their tasks in remote completion of tasks. However many of the workers had left major cities and are not planning to return and get a new office job (Davidson, 2021).

1.1. Research Hypotheses

H₁. Positive view of Remote work is related to job performance during Covid-19.

H₂. Positive view of Remote work is related to employees' job satisfaction during Covid-19.

H₃. Job satisfaction is related to job performance in remote working during Covid-19

H₄. Remote work and job performance is mediated by employee's job satisfaction while working remotely during Covid-19. So, there is a relationship between remote work and job satisfaction that leads to a positive relation between job satisfaction and job performance.

H₅. Remote work is moderated by ICT on employee's job satisfaction during Covid-19 and there is a relationship between remote work and job satisfaction by the effective and positive use of ICT.

2: Literature Review

Literature review talks about the background of remote working, the advantages and disadvantages of remote working, research philosophies, theories, and data analyzing models, variables in framework and research gaps. COVID-19 created challenges for individuals, and organization (Chabani, 2021). According to industrial and organizational society remote working is number one trend in every quarter of 2021 (Wuerfel, 2022). A researcher identified four factors that have made remote working during COVID-19 entirely different then before are, choice, children, privacy and space (Gorlick, 2020). Remote work is properly beneficial for organizations and its employees; it is a win-win situation especially during COVID for everyone (Jaiswal, 2020). Employees and organizations must believe in one another for the completion of both their job. Before COVID people were willingly working remotely as part time or full time but this calamity imposed remote work on employees due to proper lockdown and government policy (Sims, 2021). Before COVID many professionals never has an opportunity to work from home but now, they are keen to work remotely. Furthermore, many organizations find talent pool that is far away from traditional office settings so they can benefit from this talent, and organizations do not have to pay for the real estate rent. Companies are now enjoying reduced infrastructure and travel costs due to remote working (Barbour, 2020).

2.1 Background of Remote Working

The concept of remote work expands across various sectors with its behaviors, strategies and decision making by leaders for organizations (Irawanto, 2021). This remote working can be called as preventive strategy from quality assurance standards (Moore, 1999). Many problems in previous and present century such as law and order, economy, health and environment, education, information media and politics are related to remote working. In 1956, with the introduction of teleconference equipment many businesses began to grow in new markets to serve consumers unique needs (Loredana, 2017) that emerged the need of remote working.

In the first decade of 21st century mobile phones usage was becoming common for business purposes where emails could be sent and received while living away from work or at one's ease. But in March 2020, a new virus emerged as pandemic that has created many certainties and uncertainties that becomes the "new normal". COVID-19 shifted life forever

to a new opportunity because it posed a greater threat to business operations. When the spread of virus started it created many social and economic issues worldwide (Vahdat, 2021). It also interrupted supply chains globally and reduced manufacturing due to less onsite availability of staff with the threat of virus spread (Guan, 2020). Due to government restrictions many businesses were shut down and some of the employees were forced to work remotely unless they might not have used this module before that to remain businesses operational (Guan, 2020). Some leaders agree and some disagree on the continuity of remote work after the discovery of vaccine. However, some researchers have discovered that remote employees are more productive (Zavaleta, 2017). Leaders needs to clarify their communication regarding on site or remote work setting, because a positive job design with more opportunities and supervisor support result surprisingly high performance of remote employees (Tafvelin, 2019). During remote work managers can offer more autonomy and flexibility to female workforce to get greater output (Rodriguez et al., 2021). Furthermore, the virus has created global opportunities for service industry the poor and women in 21st century to outperform at their own ease (Gavas&Pleeck, 2021). In a study women are more likely to switch from work to home duties then men's. if we look at remote work then not all jobs can be performed remotely, it is understood but there are many that can change the working conditions positively. Trouble will prevail in society again and again but leaders should convey the positivity in all problems.

Collaboration with other employees, getting clear information, staying at top, giving organization time, and managing with the challenges of technology are reducing employee engagement and satisfaction to their job. In remote working environment online communication with colleagues reduces belonging among employees. Isolation, threshold and security concern reduces employees' job satisfaction. Moreover, understanding patterns, developing rapports, selection of appropriate communication or efficient working due to remote work resultantly decreases employee morale productivity and satisfaction. Furthermore, social loafing, collaboration difficulty, ambiguity in role, absence from work, less engagement in team and managing team reduces further motivation and engagement towards work. Thus, working remotely in this sophisticated technology centric environment is always a source of adding more flexibility due to pandemic in work structures. Furthermore, lack of communication, product accessibility, social interaction, is adding challenges to employees' job

satisfaction and production during remote work. However, prior to pandemic remote working was not as widely used practice as is after and during the pandemic (Kossek&Lautsch, 2018). In fact, remote working has been a “luxury for the relatively affluent” (Desilver, 2020), white collared and higher income earners. As a way forward it is crucial to consider that all jobs can never be accomplished remotely.

2.2. Advantages and Disadvantages of Remote Work

For remote working, a single technique cannot be implemented that benefits all. However, it needs different professional workers with vast expertise to visualize a beneficial and successful outcome for both the organization and its employees. There are many internal and external factors that can impact management styles for every employee that are culture, morale, motivation, market, labor, health and law etc. that impact on employees and depicts which management style could be followed. During remote work employees must identify new ideas by creative thinking. They must have problem solving techniques when a solution is needed. Remote employees must collide with organization goal. Furthermore, they can collaborate for remote teamwork and effective time management (Flores, 2019). More importantly, communication related management skill during and post pandemics are really beneficial for the continuity of ideas during on site, remote and hybrid working (Patak&Kapusy, 2021). Manager needs to make performance expectations for its employees otherwise; underperforming employees can hinder company revenue due to bad performance (Amerine, 2011). Overhead cost reduces when companies have remote employees due to non-availability of typical physical building for office. In spite of this, this remote setting complicates employee’s career development and global organizational strategy (Sims, 2021). To benefit employee’s researcher estimated that Americans who are working remotely do not affect travel time in spite of where they live (Courteny, 2021). Furthermore, remote employees start their work at their ease rather struggling with wasted travel time and transportation cost. However, zoom fatigue is a situation that occurs when employees sit on laptop whole day working and communicating with employees to participate in video conferences. Furthermore when employees engage in video conferencing whole day they suffer fatigue that reduces work engagement and job satisfaction (Shockley, 2021).

2.3 Literature Gap

There are many deficiencies in literature research regarding remote working during Covid-19 for corporate employees. The study being conducted is

unique and asks about the preferences and feelings of employees towards remote working, employee's satisfaction, job performance and use of ICT during remote working. But, at the time of this specific research very less information was available regarding business individuals in adapting remote working from traditional working during Covid-19. Previous studies lack information regarding contextual relevance regarding impact of pandemic, as how it shifted from traditional working to remote working (Wang, 2021). Studies of the past were related to remote working but not mandatory remote working enforced by government regulations (Stoker, 2021).

Belongingness is another deficiency in previous literature that how professionals think about belongingness to a peer team versus feeling of isolation during remote working and how employers or companies bridge this gap by creating greater level of connectedness by employee engagement that results in job satisfaction. Managers are supposed to address their employees and gaps that seem as stressor and may not feel as neglected employees (Hertel et al., 2005; Irawanto et al., 2021). The organization needs to increase flexibility for employees who are working remotely and align their business goals with employee expectations and new standards (Belgium, 2020). One study suggested that comparing developing and developed countries remote flexible work arrangements and cultural influence upon them. Furthermore, study limitation on China that old countries were having remote work for many years like USA other than new and developing countries (Wang et al. 2020). Researcher suggested that results vary due to cultural differences, as collectivism in Indonesian part, or tools to conduct studies, as Smart PLS software to analyze the respondents views (Irawanto et al., 2021).

However many studies were conducted as during pandemic, Farooq and Sultana (2021), used the moderator role of gender to analyze the relationship between remote work and productivity in India. Additionally, Sapta, (2021) conducted a study using Google Forms and Structural Equation Modeling and component base or variance base for Partial least square in Bali. A study was conducted before COvid-19 in UK and studied the role of occupation and gender for flexible work hours and unpaid extra time and showed that if workers have control over their schedule then there is increased number of hours as overtime (Chung & van der Horst, 2018).

Resultantly, current research is relatively addressing a new area of studies because before 2020 there was no global calamity and its cure so due to government restrictions employees were forced to work remotely. So, there

is not so much research conducted in this specific topic with regards to remote working in corporate business environment during global pandemic. Still, there is a lot to debate about remote working, job performance, job satisfaction and use of ICT in current literature during pandemic to agree or disagree whether it is hindrance or beneficial for the business. Furthermore, there are countries where in some corporate there was no concept of remote working before global pandemic but they evolve themselves with the passage of time and emerge as better firms after Covid-19. In conclusion, application and practical implication is needed for the organization that is looking forward to implement permanent remote working procedures. In case if management has knowledge that how employees feel about certain topics then this study can help them throughout their strategic planning to increase their revenue and decrease operation cost.

3. Theoretical framework

This is a mediation and moderation study where positive view of remote work depends upon perceived job performance. The four main components of this quantitative study are related to paradigm shift after Covid-19 global pandemic that is a positive view of remote working, use of ICT for remote jobs, job satisfaction and perceived job performance during remote work. In this model remote working is independent variable and job performance is dependent variable while ICT is moderating variable that modifies the originally expected relationship between IV and DV. Furthermore job satisfaction intervenes in this relationship because if there is remote working then after job satisfaction job performance increases. Additionally, ICT moderates between remote working and job satisfaction. ICT is a mode that is essential to carry out remote working. The research model is shown below:

Figure 1: Theoretical Model

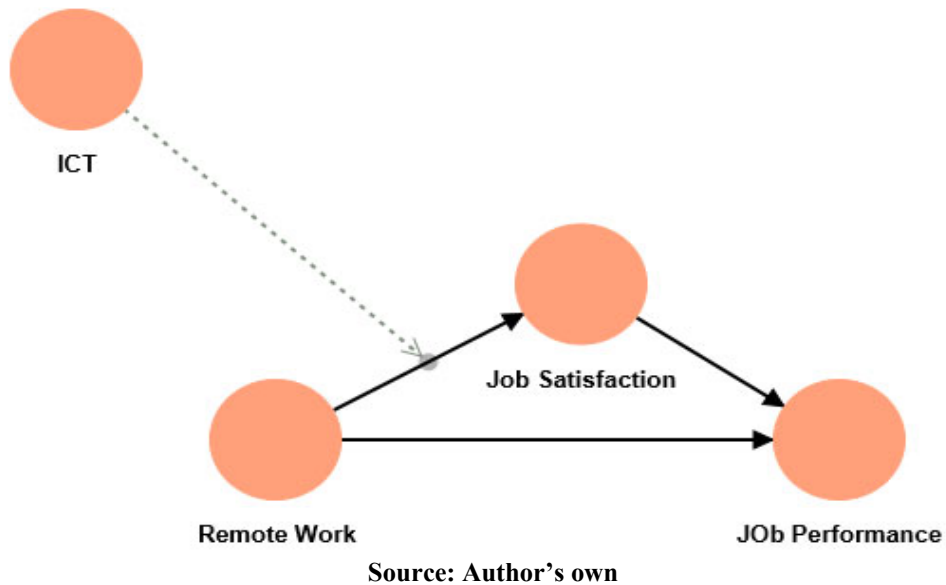


Figure 1 shows the theoretical framework. Employees control upon their work situation about how to complete the task on time creates a positive attitude in employees that leads to greater job satisfaction (Lyness et al., 2012). In this specific research participants were asked to rate their view about remote work, job performance levels, use of ICT and job satisfaction.

3.1 Participants

Data is collected from banking sector of Lahore. Leading banks were Finca, HBL and The first microfinance bank. In this study participants were informed that their information provided will remain confidential. Furthermore, participants have a full right to not participate or withdraw at any time of online survey submission without any sort of loss in academic, personal or professional standing and without any penalty in case of denial of their farm submission. Information provided is held in secure confidential files and data was digitally imported to SPSS, Smart PLS 4 and Excel files for further analysis in this specific research. Participants were not asked to provide any identifiable personnel information in this research. Additionally participants were asked to fill a pre-scanning question to ensure that they were switched to remote working during the Covid-19 pandemic in Pakistan generally and specifically Lahore. However, those who were remote workers prior to pandemic were also excluded from the study because they were not shifted to remote work.

We have used Cochran 1997 formula to calculate sample size of infinite population. Suppose maximum is 50% (0.5) with almost 95% confidence level and $\pm 5\%$ precision then our sample size will be 384 respondents.

$$n^o = z^2 pq / e^2$$

It is recommended to collect from almost 400 respondents to get more precise and accurate regression results. From which 384 respondents who have given complete responses were selected. Each participant was sent with a link of the questionnaire to further open and fill the form online at his ease and submit it online. It was ensured that all farms are specifically filled by the humans and not by artificial intelligence. The samples were consisted of the people of Lahore microfinance banking sector with remote work experience specifically during Covid-19. It was also ensured that respondents must be over 18 years of age and had physical appearance in Lahore city with no prior experience of remote working before Covid-19.

3.2 Instruments and Materials

The surveys were distributed online and respondents were asked to give their responses honestly and we will keep their responses confidential. Data of questionnaires in this specific research is collected through Teleworkers Experience Questionnaire, Satisfaction and Performance and Satisfaction with work scale (SWWS) during remote work in Covid-19. All variables are initially measured while using 5 point Likert scale in place of yes or no responses because this creates more options for the respondents and more accuracy and reliability in the results. Participants in the survey used 5 point Likert scale to give their opinion on remote working with mediation of job satisfaction and moderation of use of ICT.

3.2.1. Demographic

There was a self-designed additional instrument that was used in this current study to analyze consumers' demographic factors as age, gender and qualification. This demographic survey is meant to understand the sample participant's characteristics. If this study is supposed to be replicated in future then the researcher must know potential respondents demographics. Demographic data will be used to conduct a t-test for analysis of differences of means based on available data as of gender. Same as respondent's age will tell us at which age respondents lie more.

3.2.2. Teleworkers Experience Questionnaire

These questionnaires were published in 2015 by Anderson et al. that were almost 30 questionnaires concerning about respondents wellbeing, openness and social connectedness. Only the 5 questionnaires that were related to the

positive view of remote work were taken because our independent variable is regarding remote working. A phrase that is During Covid-19 and while working remotely is used in our questionnaire to modify the variables questions with the context. For example, “while working remotely during Covid-19, my job made me joyful”. For consistency and accuracy of survey data a 5-point Likert scale is used (1), strongly disagree, (2) Disagree, (3) Neither agree nor disagree, (4) Agree, (5) Strongly Agree. It is agreed that this is a appropriate method for measuring. In our questionnaires a scale by Anderson (2015) was used named as teleworkers experience questionnaire to measure the view of remote work for this scales greater reliability.

3.2.3 Satisfaction with Work Scale

Berube et al (2007) used satisfaction with work scale (SWWS) was used because it is a globally acceptable scale. For consistency and accuracy of survey data a 5-point Likert scale is used (1), strongly disagree, (2) Disagree, (3) Neither agree nor disagree, (4) Agree, (5) Strongly Agree. For example, “The conditions of my job are excellent”. This scale was used for participant’s responses for the evaluation of cognitive well being of employees. In a previous study this scale was used to measure relation with job satisfaction and contract breach with the mediation of supervisors support (Pohl et al,2020).

3.2.4 Satisfaction and Performance during Remote Work

O’Neil et al,(209) used this scale and is a very effective scale for conduction studies related to performance and satisfaction in remote working. In original scale work shifting word was replaced by remote working. There were two items satisfaction with remote work and perception of performance during remote work was used. For example, “I perform well as an individual contributor on my assigned tasks while working remotely”. For consistency and accuracy of survey data a 5-point Likert scale is used (1), strongly disagree, (2) Disagree, (3) Neither agree nor disagree, (4) Agree, (5) Strongly Agree. This scale was previously used in a study on telework by Anderson et al, (2015).

3.2.5 Use of ICT (Information and Communication Technology)

Amanda Putri and ali Amran (2020) used this scale to understand the positive effect of use of information and communication technology during remote work. They were basically related with the familiarity and convenience during use of ICT. For example, “I use ICT tools in doing my work at home”. For consistency and accuracy of survey data a 5-point Likert scale is used

(1), strongly disagree, (2) Disagree, (3) Neither agree nor disagree, (4) Agree, (5) Strongly Agree.

4. Methodology

This specific research has used quantitative approach to access the jobs who worked in pandemic time frame. In this study respondents were asked quantitative questions to explore their experience regarding remote working to measure job performance. This study has adapted question in survey from different researchers and also collected demographic data of respondents. Study has used teleworkers experience questionnaire to measure the positive view of remote working. Second scale used was satisfaction with work scale to understand the satisfaction of remote workers to understand the mediation in the relationship. Third scale used was satisfaction and performance during remote work to analyzes the job performance that is independent variable in the study. Fourth scale was used to measure the mediation in the relationship that is use of ICT.

4.1 Preliminary quantitative analysis

For each variable in the data set to provide information descriptive statistics were measured to provide any possible relationship between all available variables. Many tests conducted and one of them was Cronbach's alpha reliability test that is acceptable at .70 and highly acceptable at .80. Furthermore, it is really crucial to perform this so that the reader will easily understand the measures related reliability. Kenny and Baron (1986) have given a mediation model that tells us how independent variable affects the mediator and how much mediator affects the dependent variable. Assumptions of correlation were verified for linearity, normality, presence of outliers, homoscedasticity and independence of available observations. The data in this study was analyzed using Smart PLS 4 to see the difference in results without and with outliers. Demographic survey was analyzed by t-test analysis to compare the mean of onsite and offsite employees. There are not many scales to further access remote working but these relationships pave new roots for further future researches. For the tools used to measure variables in the study reliability and variability of the variables is very crucial. Validity can be said as use of valid scales made by developers and reliability is consistency in measures. The following study was open for participants in Lahore. Regression analysis is used to see the significance of each and every variable to see the mediation effect in the study model. Correlation is used to show the strength of relationship as it is significant or not significant relation. However, Common method variance (CMV) occurs

in case of error variance of measured variables. As by Padsakoff et al. (2003) sources of this CMV scale format, transient state and survey design and this could because of one instrument used in single survey. Furthermore beta value, t value and p value were used to test the results of hypothesis rather they are supported or not. This specific study has used 5-point Likert scale. However there is no option of right or wrong answers because this study is based upon the assessment of participant's perception. Additionally, transient mood is influenced while using self-reporting by respondent during rating. Also, mood disposition also inflate ratings due to negative emotions, biasness can also occur when respondents response on self-assessed behavior on social desires to look positive for design. So to reduce biasness among respondent's demographic data is helpful to identify root differences at individual level.

4.2. Testing of Hypothesis

First hypothesis H1, Positive view of Remote work is directly related to job performance during Covid-19. This H1 was tested using Pearson's correlation and its assumptions were clearly verified for independence of observations, homoscedasticity, normality, linearity and presence of outliers. H1 is considered supported when significant correlation is at alpha of 0.05, $p < .05$, $\beta > 0.10$, $t > 1.96$.

Second hypothesis H2, Positive view of Remote work is related to employee's job satisfaction during Covid-19. This hypothesis was also tested by using Pearson's correlation and its assumptions were clearly verified for independence of observations, homoscedasticity, normality, linearity and presence of outliers. H2 is considered supported when significant correlation is at alpha of 0.05, $p < .05$, $\beta > 0.10$ & $t > 1.96$.

Third hypothesis H3, Job satisfaction is correlated to job performance in remote working during Covid-19. This hypothesis was also tested by using Pearson's correlation and its assumptions were clearly verified for independence of observations, homoscedasticity, normality, linearity and presence of outliers. H2 is considered supported when significant correlation is at alpha of 0.05, $p < .05$, $\beta > 0.10$ & $t > 1.96$.

Fourth hypothesis H4, Remote work and job performance is mediated by employee's job satisfaction while working remotely during Covid-19 so, there is a relationship between remote work and job satisfaction that leads to a positive relation between job satisfaction and job performance. This hypothesis was tested using regression analysis $p < .05$, $\beta > 0.10$ & $t > 1.96$.

Moderation and mediation variables in this study by Baron and Kenny were addressed by three levels that are, conceptual statistical and strategic.

4.3 Post-Hoc Analysis

For this testing there will be no hypothesis, if the mediation and moderation is not supported. The plan is to test moderation and mediation with job satisfaction and use of ICT. Demographic data is used to compare groups, as men and women, related to each study variable. By using this data in post-hoc analysis further exploration of this relationship is focused that might go unnoticed.

5. Results And Discussion

In this section, the results of statistical data analysis are presented. Firstly, traits of respondents and descriptive statistics are explained. Secondly, the outcomes of data and assessment of measurements are calculated. Thirdly, the hypothesis testing was made. Lastly, the predictive usefulness of model was given in a definite prescribed manner. Total 385 respondents were required as our population was infinite. Microfinance banking sector of Lahore was taken due to higher concentration of research data. Those who responded were willing to respond and took favorable part is survey response. Online questionnaire were distributed to the respondents and 385 valid responses were collected out of 400. Those who were not included were those that were incomplete or devoid of fully attended response of respondent. Table 1 presents the descriptive statistics.

Table 1: Descriptive Statistics

	N	Minimu m	Maxim um	Mean	Std. Deviation
Age	385	1.00	4.00	1.5481	.82500
Education	385	1.00	4.00	1.9325	.43971
gender	385	1.00	2.00	1.5818	.49390
Valid N (list wise)	385				

5.1. Assessment of Reflective Measurement Model

In Smart PLS individual items reliability is assessed by analyzing of items loading in latent construct according to Hulland (1999). He further explains that the higher loading means there is more variance in data between construct without variance error. However, low loadings shows that power in model is very low that minimizes the estimated linkage parameters in the constructs. In reflective measurement model, indicators are mostly highly

related to each other. Reliability and validity of model is reviewed and reported using reflective model. Furthermore, researcher is supposed to verify both reliability and validity of the model. Where reliability is assessed through composite reliability but validity is assessed through convergent and discriminant loading. In addition, CFA is conducted to internal consistency (composite reliability), discriminant validity (cross loadings and Fornell-Larcker criterion) and convergent validity (Average variance extracted) of instrument. It is really important to confirm the reliability and validity of the measurement before assessing the relation in structural model.

5.1.1. Composite Reliability

In assessing the internal consistency reliability of construct, composite reliability is analyzed. In all this process loadings of items in reflective construct is tested to exceed the value of 0.5 recommended (Henseler et al, 2014). It is from 0.62 to 0.88, this indicate that in observed variable variance half. Items that were below 0.5 loading were deleted step by step to get the threshold of significant value. In reflective scale, deleted items may not affect the conceptual model or meaning of the construct. In addition, used items in the model are highly correlated as they are caused by same construct in data (Henseler et al, 2014). As a result, the internal consistency of data was in accepted range when items were deleted from the scale whose loading was below 0.5. The composite reliability of the construct was between 0.7 to 0.8 as shown in the table 2 that exceeds the recommended value of 0.7 (Henseler et al, 2014). Therefore, constructs in Table 2 shows high level of consistent reliability.

Table 2: Composite Reliability

	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)
ICT	0.760	0.778	0.847	0.582
JOb	0.799	0.802	0.857	0.500
Performance				
Job	0.760	0.769	0.839	0.512
Satisfaction				
Remote	0.777	0.785	0.849	0.532
Work				

5.1.2. Convergent Validity

AVE (average variance extracted) is determined to assess the convergent validity of the constructs in data. It is estimated that the AVE values must be greater than the threshold of 0.5. The values in this study were between the ranges of 0.5 to 0.6. The value of AVE greater than 0.5 show that there is variance of indicators.

5.1.3. Discriminant Validity

In discriminant validity two measurements are involved. That is cross loadings and Fornell-Larcker criterion. Firstly, cross loadings analysis was conducted. Heir et al (2010) and Chin (1998) explains that the loading estimates should be 0.5 or more and ideally 0.7. If the loading is 0.4 or less then it should be deleted (heir et al 2011). Furthermore, all measures should be loaded on their respective construct is needed. Secondly, in Fornell-Larcker criterion more variance is shared by latent construct with its own indicators available rather than models other constructs (Fornell and Larcker, 1981). It is agreed that, the square root of AVE should be greater than each construct correlation. In table 3 there is discriminant validity of Fornell-Larcker criterion and cross loadings. Both tables illustrate that all square root of AVE values are greater than correlation values among latent variables. It indicates that several constructs belongs to distinct entities.

Table 3: Discriminant Validity- Fornell-Lacker Validity

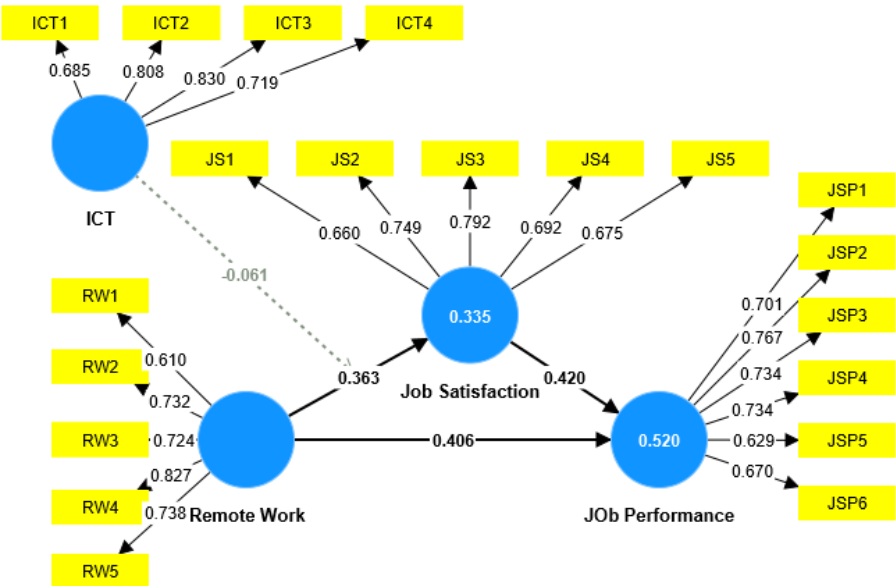
	ICT	Job Performance	Job Satisfaction	Remote Work
ICT	0.763			
Job Performance	0.612	0.707		
Job Satisfaction	0.462	0.633	0.715	
Remote Work	0.529	0.627	0.528	0.729

5.1.4. Heterotrait-Monotrait Ratio

Henesler et al (2015), suggested a new way to analyze discriminant validity for variance-based SEM. It was agreed that Cross-loadings and Fornell-Larcker are two very major approaches to analyze discriminant validity for variance-based SEM. But, these approaches had not detected the lack of discriminant validity for variance-based SEM in research situations. Therefore an alternative approach to access discriminant validity was

analyzed that was “Heterotrait-Monotrait Ratio of correlations” based upon “multitrait-multimethod matrix”.

Figure 2: Measurement Assessment Model



6. Assessment of Structural Model

After the formation of assessment model the next step is to test the hypothesis. According to Chin, (2010) by running PLS-SEM algorithm and bootstrapping, assessment of structural model was performed. First of all the predictive power of structure was analyzed by coefficient of determination (R2 Values) of the construct and then the level and significance of path coefficients (Hair, Hult et al, 2014). The overview R-square is given in Table 4.

Table 4: R-square Overview

	R-square	R-square adjusted
Job Performance	0.52	0.518
Job Satisfaction	0.335	0.329

As a rule of thumb, the values of R2 that are 0.26, 0.13 or 0.02 for endogenous latent construct are describe substantial, moderate and weak respectively (Cohen, 1992, 2014). The R2 of variables with 0.3 or more is considered at least substantial, that was met in the study (Henseler et al, 2009).

6.1: Direct Relationship Path Analysis

Non-significant paths show signs in opposite side direction, which means it does not support the hypothesis. However, significant paths support the supposed relationship empirically. Furthermore, bootstrapping with a sample of 5000 was done to get t-value and see the relationship was significant or not. Following are the bootstrapping results in Table 5

Table 5: Path coefficients-Mean, STDV, T-values, P-values

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (O/STDEV)	P values
ICT -> Job Satisfaction	0.211	0.216	0.055	3.811	0
Job Satisfaction ->Job Performance	0.42	0.423	0.053	7.95	0
Remote Work ->Job Performance	0.406	0.402	0.058	7.01	0
Remote Work -> Job Satisfaction	0.363	0.369	0.055	6.538	0



Figure 3: Path coefficients Graphical Output with t and p Values

6.2: Discussion

Results from the bootstrapping of PLS-SEM have showed the positive and significant relationship between remote work and firm performance during Covid-19 ($t=6.880$, $p=0.00$,beta is 0.36). So, hypothesis 1 is supported. (Beta >0.10, $t> 1.96$, $p<0.05$). The results showed that remote work has a relationship between job satisfaction has showed the positive and significant relationship ($t=9.410$, $p=0.00$, beta =0.43). Therefore, hypothesis 2 is

supported. (Beta >0.10, $t > 1.96$, $p < 0.05$). Further results indicated that there is a positive and significant relationship between job performance and job satisfaction during covid-19 ($t = 0.520$, $p = 0.00$). Therefore, hypothesis 3 is supported. (Beta >0.10, $t > 1.96$, $p < 0.05$)

6.3. Testing Of Mediation Effect of Job Satisfaction

Once previous relationships were tested, then the test of mediation effect is performed to analyze the mediation among the variables in Table 6 provided below. However figure 4 explains graphically the moderating effect of main and latent variables. There are many steps in analyzing this in a relationship as a researcher needs to use PLS and fit model to estimate relationship between mediator and predictor.

Hypothesis 4 reports that Remote work and job performance is mediated by employee's job satisfaction while working remotely during Covid-19, there is a relationship between remote work and job satisfaction that leads to a positive relation between job satisfaction and job performance.. Results shows (beta=0.37, $t = 5.95$, $p = 0.00$). The mediation model was tested by using having a look at model fit using PLS algorithm. Results shown are Table 6(d_ULS= 1.025, SRMR= 0.07, chi-square= 636.272, $p < 0.05$). Therefore, H4 is supported. (Beta >0.10, $t > 1.96$, $p < 0.05$).

Moreover, as per Hypothesis 5, Remote work is moderated by ICT on employee's job satisfaction during Covid-19 and there is a relationship between remote work and job satisfaction by the effective and positive use of ICT. In this hypothesis ICT effectively and significantly moderates the relationship between remote work and job satisfaction as shown in the figure 4 (beta is 0.044, $t = 2.017$, $p = -0.059$) therefore, moderation is significant. (Beta >0.10, $t > 1.96$, $p < 0.05$)

Table 6: Mediation Effect of Job Satisfaction

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (O/STDEV)	P values
ICT -> Job Satisfaction	0.213	0.217	0.057	3.734	0
Remote Work -> Job Satisfaction	0.37	0.375	0.062	5.95	0
ICT x Remote Work -> Job Satisfaction	-0.059	-0.058	0.029	2.017	0.044

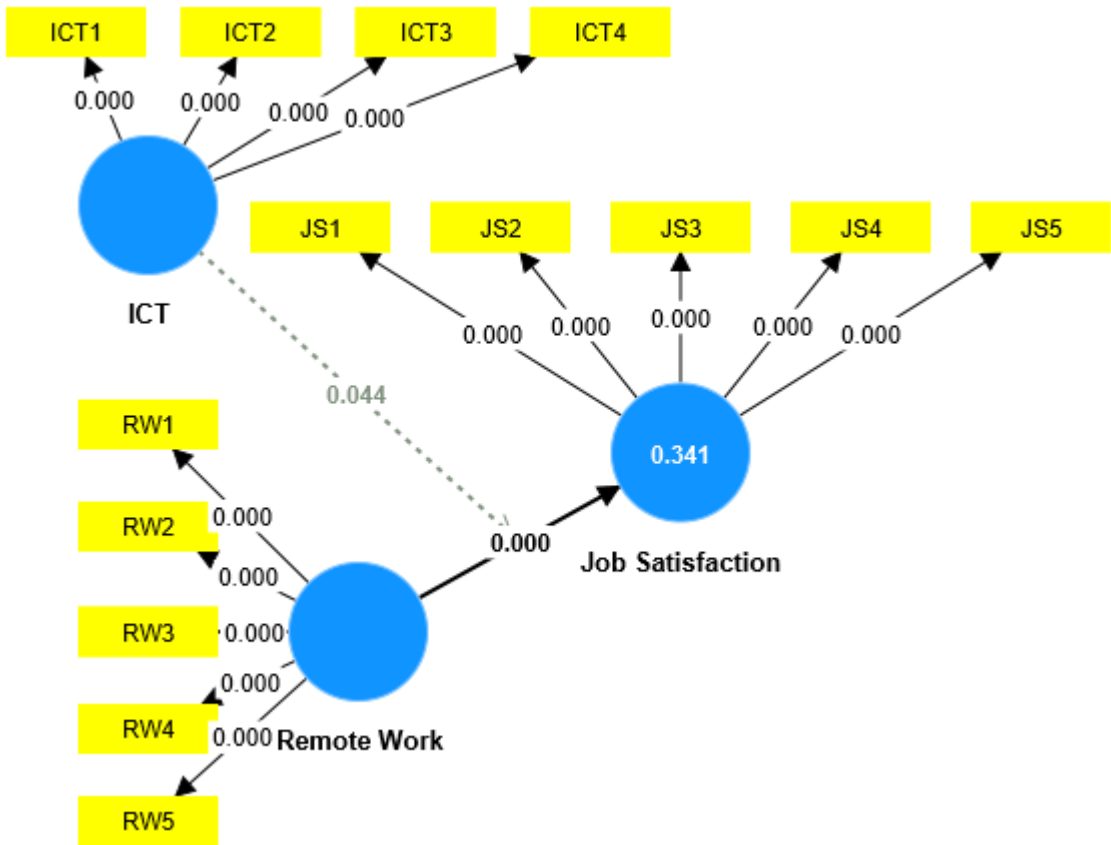


Figure 4: Moderating effect of ICT on remote work and Job satisfaction

Table 7 provided below gives a snapshot of the confirmation of all hypotheses of study. On the basis of which conclusion is given to further explain the impact of remote working of job performance indicators in Pakistan during Covid-19.

7: Summary of findings

	Hypothesis	Decision
H1	Remote work – job performance	Supported
H2	Remote work- job satisfaction	Supported
H3	Job satisfaction-firm performance	Supported
H4	Mediation of job satisfaction	Supported
H5	Moderation of ICT	Supported

7: Conclusion

This study was conducted to see the impact of remote work on job performance during covid-19 in Lahore among employees with mediation of job satisfaction and moderation of use of ICT. Findings indicate that employees outperform during covid-19 and cope with the calamity well and

are still using this model to effectively increase the job performance and satisfaction. Covid-19 virus emerged since December of 2019, this topic of research has not been explored much. This study is essential to know how pandemic might have shifted the people's view towards remote working with the effective use of ICT. This study was conducted when there was a greater threat of other variants of virus's emergence after covid as Omicron variant height in January 2022 and 2023. Many people got infected of the corona virus and were very chaotic for people all over the world. This specific study especially examined the impact of remote work on job performance with mediation of job satisfaction and moderation of use of ICT. Remote working is an effective solution during any sort of social medical emergency.

The results have supported the statistically significant positive relation between remote work and job performance among participants during Covid-19. Results of this study are similar to those of Tramonato et al. (2021), which say that during remote work perceived performance is directly proportional to the unique situation that might vary with time. Furthermore, Job-Demand and resource (JD-R) model in which researcher explained self-leadership is positively related to job performance during remote work (Galanti et al. (2021).

Results indicate that remote work is positively and significantly correlated to job satisfaction during covid-19. This data from study supported the self-efficacy and job satisfaction as explained earlier by Staples et al., (2006) but the issue of mental well-being and health is important to understand the level of satisfaction. A study by Bulinska-Stangreckan and Bagienska, (2021) explained that mental health is directly related to job satisfaction during Covid-19.

There is a positive relation between job satisfaction and perceived job performance. Allen et al., (2015) study tells that temporary performance of duties away from office affects job satisfaction. Many workers, during covid-19, said that they were happier during remote work (Emanuel & Harrington, 2021).

The relationship of ICT as a moderator is effective and results in increase job satisfaction during remote work. ICT is a medium that is used for information sharing and communication with the use of technology. During covid-19 technology has assisted more to increasing satisfaction.

8. Practical Implications and Recommendations

Covid-19 was officially declared as a pandemic in March 2020 and issued a global shutter down for businesses or corporate world. For businesses it was

essential for the businesses to continue its operations to. Then in this troublesome time remote working has allowed individuals and organizations to continue their operations in this difficult time. Most of the people were not experienced in remote work, especially without any formal training. Some were satisfied with remote working, but others wanted to go to traditional office settings to continue their tasks. There is much data in previous research about remote working but not much available related to the context of the study that is covid-19. In future, researchers will be able to build research on this issue regarding productivity during remote working with the use of ICT and sustaining job satisfaction. Many groups can benefit from this study supervisor, participants, remote workers, executives, managers and government leaders. Participants can get recommendations for their workplace when it comes to working locations as remote, on-site or hybrid. The knowledge from this study can be utilized by practitioners and they can design their work scenarios to be successful and increase performance and satisfaction with the use of ICT. Furthermore, managers will be able to understand people's sentiments, thoughts or feelings regarding on-site or off-site work. However, executives can understand and use this information potentially to design strategy that will work in the organization's best interest. Furthermore, some of the business executives have reduced their building cost by offering 100% remote work arrangements. This study finds more awareness on the topic of use of ICT, remote work, performance and satisfaction. Employers now could successfully plan rather forcefully thrust employees to remote work.

The benefits of remote working are just not I corporate level rather they extend beyond businesses to educational arena. With the start of covid-19 online distant learning started, but some of them have missed their classes just because of non-dealing with technology adaptation, internet connections, and adequate resources for online classed (AlAteeq et al., 2020). But, there is still one group that is thanking to online mode of education and working. With the threat of transmission of disease people have adapted themselves and used online software for their learning.

Remote workers are needed in every field and every era even during before and after covid-19. Virtual workplaces can potentially lead to very high emotional and social connections that are related to self-efficacy in this study. Online employees can maintain healthy boundaries as there is prevailing threat of omicron variants after covid-19 but they have learned to connect with each other and face any other issue like this with remote

connections. There are many tools used for remote working and some of them are used for machine learning, automation of work, and for connection building of teamwork. There are many software tools available in market to help managers to manage and save time by utilizing asynchronous communication, automatically transcribing meetings, reducing effort of search in multiple systems and avoiding duplication. With the usage of virtual software workers are allowed to complete their task in asynchronous time. By utilizing asynchronous brainstorming in online groups people are more creative and productive (Michinov and Primois, 2005). In this time, organizations need to address people analytics by using AI (artificial intelligence) and predictions to gather employee feedback and learn new pattern for new organizations.

Compliance with Ethical Standards

- **Conflict of Interest:** There is no conflict of Interest.
- **Informed consent:** NA
- **Funding information:** NA
- **Ethical approval:** Not Required
- **Data Availability Statement:** The data will be provided upon request anytime.

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