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Home, Office or Hybrid? Which is the Ideal Working Model for Software Developers? *

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Abstract

The main aim of this research is to examine the impacts of the radical changes in work model choice brought about by the Covid-19 pandemic on the emotions and attitudes of employees. The study group consists of 113 software developers who have returned to working from the office after Covid-19, 163 who continue to work from home, and 131 who are hybrid working from home. As a result of the research, it was seen that there were significant differences in the levels of job-related affective well-being, loneliness at work and leader member exchange between home-based, office-based and hybrid employees. Job related affective well-being and leader member exchange were found to be higher in hybrid employees compared to those working from home and office, and loneliness at work was found to be lower. There was no significant difference between the study groups in the levels of coworker exchange. Due to the current nature of the research findings, they have been discussed within the framework of limited studies in the field literature.

Keywords: Loneliness at Work, Job Related Affective Well-Being, Leader Member Exchange, Coworker Exchange, Software Developers.

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1. INTRODUCTION

The invention and widespread use of personal computers in the early 1970s, the proliferation of internet usage throughout the world, and the development of information and communication technology have created a revolution that has fundamentally changed business processes. This revolution has formed the foundation for the transition from an industrial society to an information age, which is now referred to as the digital age. Digitalization refers to the adoption or increase in the use of digital or computer technology by an organization, industry, country, etc. (Brennen & Kreiss, 2014). As individuals' interactions with each other change through new generation phones and social media platforms, businesses have also transformed the way they produce, market, and apply all of their business processes. This digital transformation is a process that results from changes caused by technological advancements (Chew, 2013). Technological advancements have led to the emergence of new forms of work and have necessitated the restructuring of organizations and organizational elements. In particular, the development of information and communication technology (ICT) and subsequent digitalization has made working from home (WFH), or working from a location physically distant from the employer, possible. This phenomenon is gradually erasing the importance of the physical dimension of organizations. Therefore, considering today's conditions, it has become necessary to examine how working conditions and situations affect organizations and employees.

In addition to technological advancements, changes in the social and economic context, such as the reduction of distance between places and the partial elimination of traditional workplaces, have begun to alter the way work is conducted and the social behaviors of employees. This has led to a need for re-organization and re-examination of organizational and intra-organizational relationships. The shift towards virtual environments, as a result of changing social patterns, has prompted companies and employees to experiment with different working methods. Many multinational corporations, for instance, offer opportunities such as hybrid working, which allows employees to working from home and divide their working hours between home and the office, through the use of information and communication technologies. Hybrid working from home (HWFH) is a flexible approach that allows employees to divide their time between working from office (WFO) and WFH, typically 2-3 days per week at home and the remaining days in the office (Bloom et al., 2022). The outbreak of the COVID-19 pandemic in 2019 has made it necessary for citizens in most countries to live in isolation at home as a result of lockdowns. The pandemic has led some businesses, especially those in the information technology sector, to fully implement WFH or hybrid working systems (Belingheri et al., 2020; Lan et al., 2020). As a result, the HWFH model is mainly used by companies in the information technology sector that provide software services.

In the information technology sector, companies providing computer software services conduct their operations by using software programs with employees known as "software developers". Software developers, in addition to the opportunities to work remotely and in a hybrid environment as part of their

working conditions, have also become an attractive profession for those who want to work in this sector due to the digitalization of businesses. The rapid digitalization of work has caused an increase in the number of software developers worldwide, including in Turkey. According to research conducted by Evans Data Corporation (2019), the number of software developers has increased by 500,000 in a year and is predicted to reach 27 million by 2023 and 45 million by 2030. As seen, the digitalization of work and processes is increasing interest in digital-focused careers. Some predictions suggest that artificial intelligence will eliminate many jobs in the future, but digital and software-focused careers will maintain their importance (Harari, 2018).

Today, organizations have become more responsive to the needs of their employees. Employee happiness, satisfaction with the organization and relationships, and emotional attachment to the organization are critical factors for organizations. Businesses that wish to retain qualified employees can develop practices to improve working conditions to make employees happy and satisfied. In the aftermath of the pandemic, research has been conducted extensively over the past two years on the attitudes of employees towards WFO, WFH, and HWFH models. Research shows that flexibility in working is one of the most important factors in deciding whether to accept a job offer (IWG Global Workspace Survey, 2019; Microsoft, 2021). The results of a survey by FlexJobs (2021) show that 58% of employees prefer to search for a different job rather than WFO (Pelta, 2021). According to the same survey, 65% of employees plan to continue working remotely on a full-time basis after the pandemic. Another survey found that employees consider the HWFH model more attractive than WFH (Vargas-Llave et al. 2020). Although WFH workers can interact with leaders and colleagues in a digital environment, they may face difficulties in sharing and forming connections. This can lead to isolation and dissatisfaction in their work lives.

According to research conducted by Kaspersky (2021a), 69% of employees reported that remote working negatively impacted their emotional health. In a survey conducted by Microsoft (2021), 40% of employees who WFH reported considering changing jobs. Another study found that 53% of remote workers felt isolated and alone (Kaspersky, 2021b). It is clear that remote working styles, which lack face-to-face interaction and are far from office environments, can lead to various negative impacts on human emotions and behavior. According to Tortumlu (2023), in his research on software developers working from home, the most significant disadvantages of remote work include loneliness and social isolation. Office environments are an important source of social interaction and a requirement for the current generation of employees in many companies (Rañeses et al., 2022). However, it is also not possible to claim that traditional office environments are ideal for all employees. A research conducted by Barrero and colleagues (2020) in the US, which included 35,000 participants, found that 32% of employees definitely did not want to return to working in the office after the pandemic.

Organizations can overcome this dilemma by implementing a HWFH model. The HWFH model is appealing because it combines the benefits of WFO, such as the opportunity for collaboration,

innovation, and face-to-face interaction with the flexibility and cost savings of WFH. HWFH arrangements create an alternative option by combining the benefits of being in the office with the benefits of WFH. HWFH workers can protect against loneliness on the days they WFO with the support of colleagues and managers (Knight et al., 2022). The results of this study support the idea that spending some working hours with colleagues and managers can balance the social disadvantages of WFH. According to the Cisco's (2021) Global Hybrid Work Research, which involved the participation of 10,000 employees in Middle East and Africa countries, HWFH workers are in better physical and mental health; 76% of the participants said that HWFH and WFH models improved their lives, and 67% of participants said that HWFH improved their family relationships.

In a study conducted by Fujitsu in 2021 on its employees in Japan, it was found that 15% of the employees chose the office as their preferred working location, 30% opted for their homes, and the remaining 55% preferred a combination of home and office, commonly referred to as a hybrid model (Scott & Gratton, 2021). In a research conducted for 6 months with 1600 employees in a multinational company, when comparing WFO (5 days) with the HWFH modal (3 days in the office, 2 days at home), it was found that there was a 35% decrease in burnout rates, an increase in job satisfaction and performance, and a decrease in sick leave rates in the hybrid working model. It was stated that these are important factors in retaining employees and increasing productivity (Bloom et al., 2022). The findings of these studies indicate that the HWFH is a win-win situation for both organizations and employees. In addition, according to the report "Agenda of Human Resources Leaders" by PwC Turkey (2021), based on a research conducted with over forty human resources managers, 94% of the managers who participated in the research stated that they believe the HWFH model will be permanent.

According to the research done by Wontorczyk and Roznowski (2022) on the level of job commitment among WFO, HWFH, and WFH workers, no significant difference was found in the levels of job commitment among workers in the three different models, but it was found that WFH workers had a higher level of job commitment in relation to relationships and social media use. In the research conducted by Uru et al. (2022) during the Covid-19 period, it was found that the relationship between work engagement and organizational identification is stronger among HWFH and WFH workers compared to WFO workers. In the research done by Bloom and colleagues (2022) comparing the job satisfaction, performance, and intention to leave of WFO and HWFH workers, it was found that returning to a HWFH model increases performance and job satisfaction and decreases the intention to leave. The physical distance between WFH workers and their colleagues and leaders can make their attitudes different than those of other working models. Managers argue that the HWFH model is necessary for productivity, employee happiness, and employee retention. In an article published in Khaleej Times, it was found that 50% of employees who are uncomfortable with less interaction with their colleague's experience burnout and 30% feel more anxious while working remotely (Rañeses et

al., 2022). On the other hand, the attractiveness of the HWFH model (Vargas-Llave et al. 2020) for employees may differentiate the affective well-being of employees from other working models.

Technological innovations and the ease brought by digitalization have led organizations to seek new ways of working. Especially with the outbreak of the Covid-19 pandemic in 2019, WFH has been forced and many companies have started to let their employees WFH. As the impact of the pandemic decreases, a return to WFO has begun. However, some companies in the IT sector have preferred WFH models such as WFH and HWFH. Today, criteria for organizations to decide on the ideal working model for their employees are limited. The potential differences in feelings and attitudes of individuals who WFO before the Covid-19 pandemic and those who switched to WFH or HWFH models after the pandemic could be an important factor for organizations to consider when choosing a working model. As research in this area is limited and further research is needed. Recently, companies like Apple, Twitter, Disney, and Getir have decided to return to full-time office work system. These decisions may be due to the negative effects of WFH on employees or problems that arose in business processes.

This situation shows that it is important for managers and employees to research which working method is more effective from different variables. Therefore, this research aims to determine whether there are significant differences in the levels of loneliness at work, job-related affective well-being, leader-member exchange, and coworker exchange among individuals who work in the software development sector in three different working models (WFH, WFO, and HWFH). The question of this research is:

Are there significant differences in levels of job-related emotional well-being, loneliness in the workplace, leader-member interaction, and interaction with coworkers between hybrid working from home workers, working from home workers, and working from the office workers?

2. METHODOLOGY

2.1. Participants

Before delving into participant information, we would like to express that artificial intelligence applications were utilized during the translation phase of this study into English.

The research group consists of 407 individuals who work as software developers in companies operating in the IT sector in Istanbul. All of the participants were WFO workers before the Covid 19 pandemic. Within this study group, 113 participants continue to working from office (WFO) for five days a week, 163 participants working from home (WFH) only since the Covid-19 pandemic, and 131 participants work with a hybrid working from home (HWFH) model (3 days home, 2 days office or 2 days home, 3 days office). Non-probability sampling method, purposive sampling, was used to form the study group. The purposive sampling method is when researchers start with the most accessible respondents and continue to sample until they reach the desired size (Büyüköztürk et al., 2016).

2.2. Data Collection Process

Ethical approval was sought before the research process began. All participants gave their consent to participate in the research by marking the field at the beginning of the questionnaire. Due to the difficulty of reaching the target group of the research, the data collection process took 8 months (01.01.2022-01.08.2022). A plan of action was first formed before the research began, and the data collection process was completed.

Leading companies in the IT sector in Turkey were identified and senior managers were contacted to conduct interviews and share surveys over a period of one month. Contacts were made with the Software Industrialists Association (YASAD) to share the research survey with member companies, permissions were obtained, and the research survey was shared. During this process, social media accounts of individuals working as software developers were tracked and contacted, and surveys were sent to those who were appropriate for the scope of the research. Throughout this implementation process, the responses of each group and participant reached by the survey were coded and tracked. During the ongoing period, interviews with companies operating in the IT sector were repeated frequently, and the research survey was shared, and a sufficient number of participants were reached in the 8-month period.

2.3. Measures

Both face-to-face interviews and Google Forms were used to collect data for the research. The survey form created consists of a total of 5 sections. In the first section, the working model, age, gender, tenure, educational status, and marital status of the employees were asked. The other 4 sections consist of the Loneliness at Work Scale, Job-Related Affective Well-Being Scale, Leader-Member Exchange Scale, and Coworker Exchange Scale.

Loneliness at Work Scale: The Loneliness at Work Scale (LWS) was developed by Wright, Burt and Strongman (2006) to determine individuals' perceptions of loneliness in their work life. The scale was adapted into Turkish by Doğan and colleagues (2009). The LWS evaluates the loneliness that employees experience in their work life. The LWS consists of a total of 16 items in two dimensions, "emotional deprivation" and "social companionship". The items that measure the emotional deprivation dimension are 1,2,3,4,5,6,7,8,9, and the items that measure the social companionship dimension are 10,11,12,13,14,15,16. The LWS is arranged on a 5-point Likert scale from strongly disagree (1) to strongly agree (2). The items 5,6,10,11,12,14,15 and 16 are reverse coded. The scale includes statements such as "I feel emotionally distant from my co-workers" and "I am satisfied with my relationships at work.

Job-Related Affective Well-Being Scale: The Job-Related Affective Well-Being Scale (JRWS) was developed by Sevastos (1996) and a study on its validity and reliability in Turkish was conducted by Duyan and colleagues (2013). The scale has 12 items. The scale consists of four monopolar

dimensions: enthusiasm, anxiety, depression, and relaxation. The EWSW is designed in a 6-point Likert scale. The items measuring the anxiety and depression dimensions are reverse coded in the scale.

Coworker Exchange Scale: The Coworker Exchange Scale (CWXS) was developed by Sherony and Green (2002) to measure the quality of employees' relationships with other work colleagues. The Turkish validation of the scale was conducted by Tortumlu and Uzunbacak (2022). The CWXS consist of one-dimensional and 5 items. There is no reverse-coded statement in the scale. The scale is designed in a 5-point Likert scale. The scale includes statements such as "My relationships with my colleagues are extremely productive" and "My colleagues understand my needs and problems related to the job".

Leader-Member Exchange Scale: The Leader-Member Exchange Scale (LMXS) was developed by Liden and Maslyn (1998) and was adapted to Turkish by Baş and colleagues (2010). The scale consists of 4 dimensions (influence, helpfulness, contribution and professional respect) and 12 items. The scale is designed in a 5-point Likert scale and no reverse coded item. The scale includes items such as "My supervisor is good enough to be a friend" and "I enjoy working with my supervisor."

2.4. Data Analysis

A causal comparison research model was used to determine whether there is a significant difference between the levels of loneliness at work, job-related affective well-being, leader-member exchange, and coworker exchange in the work life according to the working model of the working group. The causal comparison model is utilized in research to establish the reasons and results of variations between groups of participants, without any changes to the conditions or participants (Büyüköztürk et al., 2016). The demographic characteristics and descriptive statistics of the participants were analyzed using the SPSS 22 program. One-way analysis of variance (ANOVA) was used to determine whether there was a statistically significant difference in the levels of loneliness, emotional well-being related to work, leader-member interaction, and interaction with colleagues among software developers according to the working models. Before performing the variance analysis, the assumption of homogeneity of variances in the data set was controlled by performing the Levene test. The Levene test showed that the variances were equivalent, as it did not yield a statistically significant result ($p > .05$). The normality assumption of the variables in the data set was checked. When skewness and kurtosis values were examined, it was seen that values were in the range of ±1.50. According to Tabachnick and Fidell (2013), if the skewness and kurtosis values are within the range of ±1.50, it indicates that the normal distribution assumption is met. Tukey or Hochberg's GT2 tests were chosen to determine the sources of differences (Field, 2005).

The reliability of the scales used in the study was determined by calculating the Cronbach's Alpha Coefficient. Confirmatory Factor Analysis (CFA) was performed to determine whether the scales have construct validity. AMOS 21 program was used to analyze the data obtained from the participants within the scope of the research model.

2.5. Confirmatory Factor Analysis Results

In this part of the study, Confirmatory Factor Analysis (DFA) was performed in order to reveal the validity of the LWS, JRWS, CWES and LMXS scales used in the research for the study group. The CFA analyses were carried out through the AMOS 21 program. The results of the analyses were decided according to goodness of fit indices. The most commonly used of these values is the Chi-square (χ^2) or CMIN (minimum discrepancy) in the AMOS program. This value shows whether the sample is consistent with the theoretically proposed theoretical model. Consistency is achieved if the value of χ^2 is divided by the df (degree of freedom) and the result is less than 3, which indicates good fit, and between 3 and 5, which indicates acceptable fit.

The compatibility is determined by dividing the χ^2 value by the df (degree of freedom) and if the result is less than 3, it shows good compatibility, and if it is between 3 and 5, it shows acceptable compatibility. Another index of compatibility is RMSEA (The root mean square error of approximation) and CFI (Comparative Fit Index). RMSEA values below .1 are considered acceptable (MacCallum, Browne & Sugawara, 1996). It has been stated that CFI is the index of compatibility that is least affected by the sample size. Kline (2015) suggests that reporting χ^2/df, χ^2 p-value, RMSEA, and CFI is sufficient for assessing compatibility. The results are analyzed within the scope of the compatibility values shown in Table 2. Jackson and colleagues (2009) emphasize that reporting at least one of the indices such as χ^2/df, χ^2 p-value, TLI, CFI, NFI, IFI, and RMSEA value is sufficient in DFA and path analysis. In this study, the χ^2/df, CFI, RMSEA, and GFI values are also reported as compatibility indexes in the DFA and path analysis. The validity analysis results and compatibility values of LWS, WRWS, CWXS, and LMXS used in the three different study groups are shown in Table 1.

Table 1. Good of Fit Indices

Fit Indices		**χ^2**	**χ^2/df**	**GFI**	**CFI**	**RMSEA**
Working	**Measures**					
WFH	LWS	204.793	2.048	.91	.90	.083
	WRWS	130.070	2.710	.91	.93	.071
	CWXS	6.062	1.212	.99	.99	.075
	LMXS	89.164	1.820	.92	.97	.070
WFO	LWS	220.681	2.252	.90	.91	.085
	WRWS	92.920	1.896	.90	.95	.088
	CWXS	19.919	2.944	.93	.96	.076
	LMXS	111.917	2.238	.91	.96	.085
HWFH	LWS	170.915	1.726	.90	.92	0.86
	WRWS	162.660	3.320	.91	.90	0.95
	CWXS	14.142	3.535	.96	.98	0.70
	LMXS	108.381	2.212	.90	.96	0.73

The results of the CFA conducted to test the validity of the four different scales applied to the three different study groups in the research can be seen in Table 1. During the analysis process, modifications were made to the error terms as suggested by the program, and the values presented in

Table 1 were obtained as a result. After it was determined that the validity of the scales used in the research was ensured by DFA, reliability analysis was carried out to calculate the internal consistency of the scales related to the variables. The internal consistency reliability coefficients (Cronbach's alpha value = α) were examined for reliability. A scale is considered reliable if its reliability coefficient is higher than 0.40. As a result of the reliability analysis carried out within the scope of this research, it was seen that the reliability coefficients of the scales used were between 0.65 and 0.95.

3. RESULTS

The averages of the variables and dimensions according to the three different study models in the research are presented in Table 2. The scores for the research variables of loneliness in work life, interaction with colleagues, and interaction with leader members range from 1 to 5, while the scores for emotional well-being in relation to work range from 1 to 6.

Table 2. Mean and Standard Deviation of Variables

Variables	WFH $\bar{X}$ (SS)	WFO $\bar{X}$ (SS)	HWFH $\bar{X}$ (SS)
1. Loneliness at work	1.98 (0.66)	1.92 (0.71)	1.70 (0.56)
a. Emotional deprivation	1.93 (0.78)	1.92 (0.78)	1.72 (0.63)
b. Social Companionship	3.60 (0.70)	3.73 (0.83)	3.93 (0.61)
2. Job-related affective well-being	4.14 (0.80)	4.03 (0.93)	4.40 (0.81)
a. Enthusiasm	3.83 (0.98)	3.74 (1.21)	4.13 (0.98)
b. Relaxation	3.40 (0.91)	3.32 (1.27)	3.58 (1.05)
c. Depression	2.20 (0.89)	2.35 (1.01)	2.00 (0.90)
d. Anxiety	2.70 (0.97)	2.70 (1.21)	2.40 (0.98)
3. Coworker Exchange	4.06 (0.70)	3.97 (0.78)	4.14 (0.71)
4. Leader-Member Exchange	4.05 (0.75)	3.88 (0.91)	4.17 (0.80)
a. Influence	4.18 (0.92)	3.89 (1.12)	4.30 (0.90)
b. Helpfulness	3.85 (0.91)	3.70 (1.02)	4.03 (0.90)
c. Contribution	3.93 (0.80)	3.97 (0.94)	4.02 (0.88)
d. Professional Respect	4.22 (0.92)	3.94 (0.11)	4.30 (0.93)

The standard deviation (SS) and mean values ($\bar{X}$) of the variables used in the research according to the working models are shown in Table 2. The results of the mean difference analysis of the levels of loneliness at work, job-related affective well-being, coworker exchange, and leader member exchange among employees who WFH, WFO, and HWFH models are shown in Table 3.

Table 3. Results of ANOVA

Variables	Working Model	n	$\bar{x}$	SS	F	p	Differences
Loneliness at work	WFH (A)	163	1.98	0.052	6.550*	.002	A-C B-C
	WFO (B)	113	1.92	0.067			
	HWFH (C)	131	1.70	0.049			
Job-related affective well-being	WFH (A)	163	3.83	0.088	3.954*	.020	A-C B-C
	WFO (B)	113	3.74	0.114			
	HWFH (C)	131	4.13	0.095			
Leader-member exchange	WFH (A)	163	4.05	0.058	3.610*	.028	B-C
	WFO (B)	113	3.88	0.086			
	HWFH (C)	131	4.17	0.069			
Coworker exchange	WFH (A)	163	4.06	0.055	1.623	.199	–
	WFO (B)	113	3.97	0.073			
	HWFH (C)	131	4.14	0.062			

The difference analysis results shown in Table 3 are related to the averages of the variables presented in Table 2. Therefore, Table 2 should be considered when comparing the results of the difference analysis. According to Table 3, levels of loneliness at work differ significantly among working models. The levels of loneliness at work of HWFH workers are lower than those of other working models. Job-related affective well-being levels also vary among working models. HWFH workers have higher means of job-related well-being compared to those WFH and WFO. When looking at the analysis results on whether the levels of leader-member exchange differ among working models (Table 3), HWFH workers have higher levels of leader-member exchange compared to those WFO. However, the levels of coworker exchange do not differ among the three working models.

4. CONCLUSION

The digitization of the working life and working styles has led to the emergence of new working models. Some organizations in the IT sector are able to perform their services with the use of computer programs and applications and offer their employees the opportunity to work remotely. Organizations that had not experienced WFH prior to the Covid-19 pandemic were forced to switch to WFH due to pandemic restrictions. As the effects and restrictions of the pandemic have decreased, some organizations have returned to WFO while others have continued to implement the WFH model. It is of interest to understand what effects this change has had on the attitudes and feelings of employees. Therefore, the aim of this study is to determine whether the levels of job-related affective well-being, loneliness at work, leader-member exchange, and coworker exchange of software developers who WFH, in the WFO and in a HWFH differ in the IT sector.

The changes in work and lifestyles, accelerated by digitization and the recent Covid-19 pandemic, affect people's habits, feelings, behavior and attitudes. The ability to work remotely has led to changes in people's perceptions of work and the workplace, and organizations are increasingly inclined to implement new forms of work. However, it is a matter of research to understand what changes these new conditions will bring about in the feelings, behavior and attitudes of employees. In this research, the levels of job-related affective well-being, loneliness at work, leader-member exchange and coworker exchange of employees WFH, WFO and in a HWFH model were determined and the results were analyzed.

When the levels of loneliness at work were examined, it was seen that the highest average value was found in the employees WFH and the lowest average value was found in the HWFH employees. HWFH employees had the lowest average in the emotional deprivation dimension of loneliness in work life, while they had the highest average in the social companionship dimension. On the other hand, the lowest average in the social companionship dimension was found in the employees WFH. Loneliness in work life is an important feeling that can arise from many reasons in organizational life. Employees WFH are socially isolated due to factors such as the working environment of the home. Social isolation

is defined as the lack of objective interaction with others (Cornwell & Waite, 2009). Employees WFH are deprived of important resources such as support from work colleagues. Employees WFH perform their tasks physically separated from the workplace, colleagues, and managers. Physical separations can fuel feelings of social isolation and loneliness (Cowan, 2020). This situation can lead the employee to a lack of social networks and isolation (Tortumlu, 2023; Cacioppo & Hawkley, 2003). Therefore, one of the reasons for the higher levels of loneliness in work life among employees WFH may be social isolation and lack of social networks. Indeed, a study found that 53% of WFH workers reported feeling isolated and alone (Kaspersky, 2021b). Additionally, software developers working from home perceive loneliness as the biggest disadvantage of remote work (Tortumlu, 2023). Being isolated for a long period of time can make the employee feel less "belonging" to the organization and even increase the intention to leave the company (Larson et al., 2020).

The results of the difference analysis conducted within the scope of the research indicate that the level of loneliness at work of HWFH workers differs from that of home and WFO workers. However, it is understood that the levels of loneliness at work do not significantly differ between WFH and WFO workers. The HWFH model offers the flexibility of working both in the WFO and WFH, thus reducing the disadvantages that arise from working in an office environment or at home. While WFH workers can only interact with colleagues and managers through digital tools, HWFH workers can have face-to-face interactions with their work environment on certain days of the week. This is an important factor that prevents feelings of loneliness at work (Cowan, 2020). HWFH workers are protected from feelings of loneliness on the days they work in the office by the support of their colleagues (Knight et al., 2022). Working in the HWFH is an important factor in displaying positive behaviors (Bloom et al., 2022). On the other hand, it is difficult to say that working in the office is an ideal model even in sectors that have the opportunity to work remotely technically. Especially in office environments, it can be encountered with negative situations such as bullying, rough behavior and mobbing. Individuals who WFO all day are more likely to be exposed to these behaviors. Negative behaviors such as mobbing (Tetik, 2010) and workplace bullying (Li et al., 2022) have been found to increase loneliness in work life.

Based on the research results, when examining the levels of job-related affective well-being of employees, it was found that the highest average value was found in HWFH employees, while the lowest average value was found in WFO employees. HWFH employees had the highest average on the dimensions of enthusiasm and relaxation in terms of job-related affective well-being, while they had the lowest average on the dimensions of depression and anxiety. The results of the difference analysis showed that the levels of job-related affective well-being of HWFH employees differ from that of WFO and WFH employees. The fact that the level of job-related affective well-being of HWFH employees is higher than that of WFO and home-based employees explains this result. However, no significant difference was found between the levels of job-related affective well-being of WFO and WFH employees. The flexibility provided by the HWFH model to the employee can be an important source

of internal motivation. According to the Broaden and Build Theory (Fredrickson, 1998), it is claimed that happy people can have a wide range of creative and flexible thinking repertoires and can generate different solutions to problems. This undoubtedly brings important results for the individual and the organization in terms of developing innovative ideas, productivity, and intellectual capital (Fisher, 2010, p. 384). The internal motivation of an employee with a flexible working environment is an important factor in becoming a happier person (Ab Wahab & Tatoglu, 2020; Hayman, 2010). The HWFH flexibility provided by the organization to its employees is revealing the trust of the employee in the organization, as well as the trust of the organization in its employees. Trust in leaders and colleagues reduces loneliness in the working life and increases happiness. (Taşpınar & Eryeşil, 2021).

In another perspective, the role of relationships with colleagues and interactions with leaders in the happiness of employees is significant. An employee who only interacts with the organization through digital tools may not be satisfied with this interaction. It may be difficult for a newly joining WFH employee to share with their colleagues, perceive support, and become attached to their manager and organization. The lack of sharing and interaction can make the employee anxious and unhappy. Although the employee interacts with family and social friends outside of work, the satisfaction obtained from the relationship with colleagues who share the same job and conditions will be different. The relationship with colleagues and leader is an emotionally nourishing source for the individual. According to the Job Demands-Resources Theory, the source of negative stress is the lack of relationship and support (Wontorczyk & Roznowski, 2022). Within this framework, Bakker and Demerouti (2017) stated that job demands factors are uncomfortable physical working environments and emotionally mandatory interactions. The Conservation of Resources Theory (Hobfoll, 1989) argues that creating basic resources that make life satisfying and enjoyable throughout life is essential. When a person experiences a surplus of these positive resources, they experience a positive well-being experience; when they cannot access these resources, they experience stress or well-being deficiency (Hobfoll, 1989, p. 517). The deficiency in resources can lead to workplace isolation. Workplace isolation is a two-dimensional structure that represents the isolation perceived from others in the workplace and both colleagues and the company's support network (Marshall et al., 2007). Workplace isolation negatively affects employee happiness (D'Oliveira & Persico, 2023). Therefore, the physical attachment of HWFH employees to the office is critical in employee happiness.

Another finding of the research is that the highest average level of leader-member exchange is found among HWFH workers, while the lowest average value is found among WFH workers. HWFH workers had the highest average value in all dimensions of leader-member exchange, including impact, responsibility, and professional respect. WFH workers, on the other hand, had the lowest average value in leader-member exchange dimensions. The results of the difference analysis showed that the leader-member exchange levels of HWFH workers differ from those of WFH and WFO. The higher level of leader-member exchange of HWFH workers is responsible for this result. The flexibility provided by

the organization and leaders to HWFH workers can increase positive attitudes towards the organization and leaders. The flexibility provided to the employee is related to the autonomy provided in the work. Employees experiencing more autonomy in their work improve the quality of leader-member exchange (Volmer et al., 2012). Various studies have found that employees with high-quality leader-member exchange experience more autonomy in the workplace (Zhang et al., 2012), are more responsible (Ilies et al.), and have more opportunities to express their ideas about the organization (Bernerth et al., 2016).

HWFH workers being in the office on specific days of the week and interacting with their manager in a physical environment can increase interaction. In the case of WFH workers, it is difficult to talk about this interaction. Because WFH workers interact with their leader through digital tools. In the case of office workers, this interaction is continuous and frequent. The frequency and continuity of interaction can be evaluated from two different perspectives. The first is that the organizational environment, the leader and the colleagues are ideal for the employee, they are happy while working, and as a result, they are emotionally attached to the organizational elements. In this case, the office worker's leader interaction may be positively affected by the office environment. However, it is difficult to say that the first situation is generally widespread and the majority. In the second case, the employee's approach to organizational elements is average or negative. Although the level of interaction with the leader is average or positive for office workers, there is a higher possibility of being affected by employees who have problems with their leader, complain or spread rumors and gossip in the organization in order to achieve various goals. Gossip in the workplace leads to cynical behavior and psychological contract violation (Kuo et al., 2015). Psychological contract violation reduces leader-member exchange and increases cynicism (Gültekin, 2014; Kırboğa, 2017). Being in the office environment during working hours is a routine situation for WFO workers. However, one of the main goals of HWFH workers being in the office on certain days of the week is to ensure organizational interaction. Therefore, this interaction may be more meaningful for the HWFH worker, and the levels of leader-member exchange and coworker exchange may be higher. Indeed, all these factors, which emerged as a result of the research, indicate that the level of leader-member exchange of WFO workers is higher than that of HWFH workers.

According to the analysis conducted within the framework of the research, the lowest average for coworker exchange was found to belong to WFH workers, while the highest average belonged to HWFH workers. However, the results of the analysis show that there is no significant difference in coworker exchange among the groups. This result is due to the groups receiving similar average values. Although the lack of face-to-face contact would be expected to result in a much lower level of coworker exchange among WFH workers, the research found that there is no significant difference in coworker exchange among the groups. There could be many reasons for this outcome. Employees who have worked together in the same organization for many years, and who have formed a certain level of emotional bond, may not be affected by the working model in terms of their interaction. On the other

hand, it may be difficult for newly joined employees or individuals to achieve similar interactions while working remotely. Especially, WFH programmers may have limited opportunities to interact and recognize their colleagues in physical environments and dependent on the social activities and human resources practices of their organizations.

4.1. Limitations and Future Research

This research was conducted on software developers WFH, WFO, and in a HWFH model in software service companies in Istanbul, in the IT sector. Although the number of software developers in Turkey is currently at a lower level compared to other occupational groups, it can be said that it is a group of employees whose numbers are increasing year by year. Therefore, the results of the research cannot be generalized to all employee groups. In this respect, it can be considered as a limitation of the research that the results and outcomes of the research should be evaluated only for software developers. On the other hand, the Covid-19 pandemic that the world faced in 2019 also changed working conditions, and the research was conducted in a period that can be considered new in terms of these changes. Additionally, this research is a quantitative study and it is assumed that the surveys filled out are unbiased and impartial.

This research focuses specifically on the potential differences in emotions, behaviors, and attitudes of employees caused by the rapidly changing work conditions and situations resulting from the development of information technologies and factors arising from the Covid-19 pandemic. Within this framework, similar samples can be analyzed by comparing the different emotional states and behaviors of WFH, WFO, and HWFH workers. By forming three different groups within WFH, WFO, and HWFH workers, focus group interviews can be conducted to understand how working conditions affect emotions, attitudes, and behaviors, which can provide a deeper understanding of the subject. Additionally, research on evaluating different working models from the perspective of managers will contribute significantly to the literature. On the other hand, it is necessary to study organizations that have been forced to return to WFH but have returned to WFO after the threat of the pandemic has decreased. Because examining the main factors that lead these organizations to make this decision can provide important information to researchers and practitioners.

4.2. Managerial Implications

The physical separation of an employee from the office environment can keep the individual in the midst of social mobility. Otherwise, WFH can lead to social isolation. Physical separations can lead to social isolation and loneliness (Cowan, 2020). Social isolation refers to the lack of interaction with others (Cornwell & Waite 2009). Individuals who are deprived of social networks due to social isolation can exhibit withdrawal behavior (Cacioppo & Hawkley, 2003). On the other hand, family and friendship networks can support healthy behaviors (Christakis & Fowler, 2013). The employee's low-level interaction experience with the leader and colleagues can further isolate and unhappiness the individual.

These negative effects can be prevented by organizations' practices aimed at increasing the leader and coworkers' interactions. It is believed that the employee's relationship with the manager and social interaction play an important role in perceiving job stress (Karasek, 1979). Managerial support positively affects work attitudes (Ng & Sorensen, 2008). Additionally, support from colleagues can also lead to positive work attitudes (Kossek et al., 2011). Different work models may also lead to different employee feelings, work attitudes, and behaviors. Research in the field of organizational behavior has revealed that loneliness in the workplace decreases work performance (Ozcelik & Barsade, 2011), inhibits creativity (Peng et al., 2017), reduces organizational commitment (Ayazlar & Güzel, 2014; Stoica & Brate, 2013) and leads to depression (Erzen & Çikrikci, 2018). In addition, it is claimed that loneliness increases the likelihood of death by 26% (Holt-Lunstad et al., 2015). Strong evidence has been found that both social isolation and loneliness are associated with death, cardiovascular disease, depression, and anxiety (Leigh-Hunt vd., 2017).

The differences in national currency values among countries, particularly in Turkey as a developing country, can give an employee the opportunity to work remotely for a competing business in another country and benefit from that country's higher salary, while still being able to live well in their own country. Therefore, IT companies in Turkey may face difficulty in retaining their employees. While salary is an important factor in the intention to leave a job, organizations can prevent this intention by establishing healthy communication with employees, building strong ties and creating conducive working environments. Research conducted by Seyrek and Inal (2017) on IT employees found that organizational loyalty reduces the intention to leave a job, while an increase in job alternatives increases the intention to leave a job.

In this research, the loneliness at work, job-related affective well-being, and exchanges between leaders and coworkers of software developers WFH, WFO, and in a HWFH manner were compared in the IT sector. It was found that the positive emotions and attitudes of HWFH software developers were higher than those of other groups. Based on the data obtained from this research, it can be recommended that businesses with software developers in their companies implement a HWFH model. However, some businesses in this sector also have employees WFH from different cities or countries. In this case, the opportunity for HWFH is eliminated. Especially for companies with many employees, an office environment can be prepared for employees living in the same city or region to increase interaction. As seen in the research, the biggest factor in reducing the loneliness of WFH workers is their colleagues. In this regard, some suggestions can be made to managers.

The International Labour Organization (ILO) has stated that all efforts should be made to ensure that managers and employees can connect with each other when considering the risk of social isolation for remote workers (ILO, 2020). Within the organizational structure, an interaction unit can be established to control relationships only among coworkers, establish a harmonious environment, and organize face-to-face and digital interactions. It has been argued that high-quality organizational

interaction can help employees develop positive energy and ultimately lead to higher happiness by developing more personal resources (Le et al., 2020). Research has provided clear evidence that the quality of organizational interaction affects employees' attitudes, job outcomes and well-being (Dulebohn et al., 2012; Epitropaki & Martin, 1999; González-Navarro et al., 2019).

Employees can be given the opportunity to use shared offices where they can work together in their region. In a research conducted by Ağcadağ Çelik (2021), it was found that employees who use shared offices are highly satisfied with the provision of all the necessary facilities that a ready-made office provides. Periodically, social events such as sporting activities, games, and trips can be organized by bringing all employees together. Because face-to-face interactions among employees can increase organizational loyalty by building emotional ties. One day of the week, at a specific time, out of work, online meetings can be held where everyone can express themselves and share about their general lifestyle. Additionally, research results show that the well-being levels of WFH workers are affected by relationships with coworkers and leaders. Leaders have an impact on the well-being of WFH workers. In fact, the leader having more out-of-work interactions with WFH workers can make the employee feel better. The leader can increase face-to-face and online meetings with employees more frequently at certain periods.

For the study, ethics committee permission document dated December 6, 2021 and numbered 114/17 was obtained from the Suleyman Demirel University Ethics Committee.

The study has been crafted in adherence to the principles of research and publication ethics.

The authors declare that there exists no financial conflict of interest involving any institution, organization, or individual(s) associated with the article. Furthermore, there are no conflicts of interest among the authors themselves.

The authors contributed equally to the entire process of the research.

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