

Telework benefits and associated health problems during the long COVID-19 era

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Abstract.

BACKGROUND: Teleworking became a necessary practice as an alternative to office work during the long COVID-19 era.

OBJECTIVES: To recognize the telework associated benefits and health problems and to assess the relationship between some teleworkers' characteristics, their health problems with job satisfaction and recuperation for promoting telework practices.

METHODS: A cross-sectional online survey was conducted among employees working remotely in different work sectors using a questionnaire assessing job satisfaction and recuperation.

RESULTS: Telework benefits included saving time and money (89.3%), minimizing the COVID-19 spread (86.9%), and balancing of work and life (63.4%). Telework associated health problems included musculoskeletal (78.2%), work-related stress (65.9%), and visual problems (47%). Telework job satisfaction was significantly higher among married male workers, working less than 40hs/week, and with previous remote working experience before COVID-19. On the other hand, married female teleworkers working more than 40hs/week and without previous remote working experience before COVID-19 had significantly more perceived fatigue and less recuperation. All teleworkers with reported health problems showed significantly more perceived fatigue and less recuperation.

CONCLUSIONS: More than half of the participants recommended continuing teleworking post-COVID-19 due to its benefits on their working and social life. Telework would enables the employers to adapt and satisfy the teleworkers' expectations to maintain their work and productivity.

Keywords: Pandemic, Saudi Arabia, job satisfaction, recuperation, working from home, coronavirus

1. Introduction

Telework practices are not a new concept and are commonly associated with high-skilled white-collar jobs, but a worldwide massive shift to teleworking occurred following the ongoing crisis of the COVID-19 pandemic with various effects on the workers'

jobs and lives [1]. Some studies showed that working from home increased productivity, satisfaction, and allowed to better reconcile work-family duties. On the other hand, others felt teleworking, and the ensuing communication through digital platforms challenged the possibility to receive meaningful feedback and exchange ideas with co-workers and supervisors. Implementing telework in developed countries started several years ago, but little is known about the adoption of telework in developing countries [2, 3]. The use of telework before the COVID-19 cri-

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sis varied substantially across countries, occupations sectors, and firms with tremendous growth during the crisis as a crucial strategy to mitigate the pandemic's health-related and economic consequences [4]. A wide range of work sectors either required or allowed their workers to perform home-based telework (HBT) [5]. Recent studies from Australia, Europe, and the USA emphasized the growth in implementing teleworking during the COVID-19 pandemic than before [2, 3]. In developing countries with little adoption of teleworking before the COVID-19 crisis, implemented the HBT as a prompt response to this unprecedented situation without a contingency plan in various companies of different sectors, different sizes, and capacities [6].

Despite the fact that telework increases people's flexibility and autonomy, it also has recognized effects on health, which is still less studied [7]. Musculoskeletal problems, isolation, depression, and stress were the commonest health problems associated with telework as reported in different studies [8, 9]. In contrast, reduced commuting time, better work-life balance, and better control over schedule time were reported as telework benefits in other studies [10, 11].

Because of the long COVID-19 era with the increasing need for excessive downscaling of workspaces and keeping the telework practices to maintain productivity, this study aims to recognize benefits and health problems associated with telework practice among teleworkers in different work sectors in the Medinah region, Saudi Arabia, to assess the relationship between some participants' characteristics, their health problems with job satisfaction and recuperation among teleworkers, and to determine the preference for telework post-COVID-19 for promoting telework practices and enables the employers to be ready to adapt and satisfy the teleworkers expectations to maintain their work and productivity.

2. Methods

2.1. Study design and setting

A cross-sectional online survey was carried out from 1 April to 1 May 2021 among employees working remotely in different work sectors in the Medinah region, Saudi Arabia.

2.2. Study participants, sampling, and procedures

A semi-structured questionnaire was prepared based on previously published research articles related to teleworking and then designed electronically on Google Forms and shared via different social media at which the authors are members such as posts on Facebook, WhatsApp groups, Twitter, telegram with further snowball sampling to achieve maximum participation. The optimal sample size was calculated to be 385 participants by using OpenEpi software version 3.01 with a proportion of 50%, 5% margin of error, and a 95% confidence interval [12]. All the full-time/part-time paid employees that moved to work remotely as a result of the COVID-19 pandemic were legible to participate in the study.

2.3. Tools of data collection

The questionnaire consisting of 4 sections:

1. Questions about the socio-demographic and occupational characteristics such as age, gender, education, number of cohabitants, in particular minor children, type of workplace (e.g. public or private), full-time or part-time, previous remote working experience [4, 13]. Also, questions asking about the benefits of telework as perceived by participants [14].
2. Health problems: Health assessed by questions asking about the commonest problems facing teleworkers gathered from previous research [15–17].
3. Telework job satisfaction: Assessed by the Utrecht Work Engagement Scale UWES–9S [18]. It is a self-report scale consisting of 9 questions grouped into three subscales: vigor (VI), dedication (DE), and absorption (AB). All items are scored on a seven-point scale ranging from 0 (never) to 6 (always). A total score was then calculated as the mean of the responses Higher values indicate more telework job satisfaction.
4. Recuperation: Assessed by 6 questions covering fatigue and rest/recuperation [19]. Responses were given on 5-point scales ranging from 0 (never) to 5 (very often), and one item scale was reversed (Do you feel you have recovered and are thoroughly rested when you start work in the morning). A total score was then calculated as the mean of the responses. Higher values indicate more perceived fatigue and less rest/recuperation.

At the end of the electronic questionnaire participants, were asked about their opinion for recommending or refusing continuity of telework.

2.4. Ethical considerations

The online questionnaire included an informed consent form following the Declaration of Helsinki explaining the confidentiality of the obtained information and the purpose of the study. The necessary official permissions were obtained from the Taibah University Research Ethics Committee (Ref No #TU-20-017). The questionnaire was adequately translated into Arabic and then back-translated into English by a different language expert. A group of bilingual professionals assessed the Arabic versions for content validity. Cronbach's alpha was used to test reliability and was high for most of the questions.

2.5. Data management

Statistical analysis was done using SPSS version 25.0. Quantitative data were represented as a mean and standard deviation, and qualitative data were represented as frequencies and percentages. Descriptive statistics were used to determine the commonest health problems associated with teleworking. Normality was assessed using the Shapiro-walk test. The student's *t*-test was used as a test of significance to compare means across groups. The test results were considered significant when the *p*-value ≤ 0.05 .

3. Results

A total of 413 participants are 55.4% males and 44.6% females with a mean age of 36.49 ± 5.02 years. Most of them are married 69.2% and postgraduates (53.8%). More than half of them (57.1%) had more than 3 cohabitants at home and 60.3% were children less than 12 years. The majority of participants don't have caregivers at home (72.2%) (Table 1).

The majority of teleworkers worked in the private sector (66.3) with a full-time job (83.5%) and (67.8%) of them had no remote working experience before the COVID-19. Most of the participants worked more than 40hs/week (69.5%) with full data access (76%). Participants worked both from home and at the workplace (51.3%) with the same work tasks (74.1%), they reported difficulty in focusing on work at home (71.2%) (Table 2).

Table 1
Characteristics of the participants

Characteristics	No (%)
	413
Age mean \pm SD	36.49 \pm 5.02
Gender:	
Male	229 (55.4)
Female	184 (44.6)
Educational level:	
Graduate	191 (46.2)
Postgraduate	222 (53.8)
Marital status:	
Married	286 (69.2)
Unmarried	127 (30.8)
Number of cohabitants at home:	
< 3	177 (42.9)
≥ 3	236 (57.1)
Presence of minor children less than 12 years?	
Yes	249 (60.3)
No	164 (39.7)
Presence of assistant, caregiver for elderly cohabitants or children:	
Yes	115 (27.8)
No	298 (72.2)

Table 2
Occupational characteristics of the participants

Characteristics	No (%)
	413
Type of workplace:	
Public	139 (33.7)
Private	274 (66.3)
Employment status:	
Full-time	345 (83.5)
Part-time	68 (16.5)
Previous remote working experience before the COVID-19 period:	
Yes	133 (32.2)
No	280 (67.8)
Amount of telework hours/week:	
< 40 hs	126 (30.5)
≥ 40 hs	287 (69.5)
Limited access to data when teleworking from home:	
Yes	99 (24.0)
No	314 (76.0)
Difficulty in focusing on work at home:	
Yes	294 (71.2)
No	119 (28.8)
Place of working during the COVID-19 period:	
Completely working from home	201 (48.7)
Working at both home and workplace	212 (51.3)
Type of remote work:	
Same as office work	306 (74.1)
Different tasks	74 (17.9)
Different salary	33 (8.0)

Study results showed that participants reported the benefits of telework including saving time and money (89.3%), minimizing the spread of COVID-19

Table 3
Benefits of telework practices

Benefits	No (%)
	413
Save time and money on travel to work:	
Yes	369 (89.3)
No	44 (10.7)
Flexible hours to conduct work:	
Yes	241 (58.4)
No	172 (41.6)
Increased productivity:	
Yes	275 (66.6)
No	138 (33.4)
Greater independence in work commitments:	
Yes	294 (71.2)
No	119 (28.8)
Better balance of home and work life:	
Yes	262 (63.4)
No	151 (36.6)
Teleworking from home minimizes the spread of COVID-19:	
Yes	359 (86.9)
No	54 (13.1)

(86.9%), increase independence (71.2%) and productivity (66.6%), balancing work and life (63.4%), and flexible working hours (58.4%) (Table 3).

Participants reported several health problems associated with telework including musculoskeletal (78.2%), work-related stress (65.9%), sleeping disorders (51.1%), Visual problems (47%), poor mental health (45.5%), chronic diseases (42.6%), and feelings of isolation (22.8%) (Table 4).

When studying the association between some participants' characteristics with the telework job satisfaction we found that male workers, married, working half time, previous remote working experience before the COVID-19, and those working less than 40 hs/week showed higher job satisfaction. On the other hand, female teleworkers who were married, worked full time, had no previous remote working experience before the COVID-19, and worked more than 40 hs/week, had significantly more perceived fatigue and less recuperation (Table 5).

Teleworkers without health problems showed significantly higher job satisfaction than those having health problems except for the feeling of isolation and work-related stress no significant differences were found. All teleworkers with reported health problems showed significantly more perceived fatigue and less recuperation (Table 6).

Asking the participants about their opinion for promoting telework after the COVID-19 era, 62.7% recommended continuing teleworking while the remaining (37.3%) opposed to the telework due to

Table 4
Health problems associated with telework

Health problems	No (%)
	413
Increases the development of musculoskeletal problems (e.g. neck, shoulders, wrist, hand, lumbar regions):	
Yes	323 (78.2)
No	90 (21.8)
Induce feelings of isolation:	
Yes	94 (22.8)
No	319 (77.2)
Chronic diseases (e.g. hypertension, high cholesterol, diabetes):	
Yes	176 (42.6)
No	237 (57.4)
Visual problems:	
Yes	194 (47.0)
No	219 (53.0)
Sleeping disorders:	
Yes	211 (51.1)
No	202 (48.9)
Work-related stress:	
Yes	272 (65.9)
No	141 (34.1)
Poor mental health (e.g. anxiety, depression):	
Yes	188 (45.5)
No	225 (54.5)

some causes as technical failures (93.5%), increased work amount (92.2%), difficult job management (89.0%), lack of interaction with colleagues (84.4%), increased distraction (81.8), and salary reduction (80.5%).

4. Discussion

Before the COVID-19 pandemic, telework practices varied substantially across countries [20]. To date, few studies particularly in Arab countries have investigated teleworking. As nowadays telework has become a crucial and permanent feature of the future to sustain working life and keep the organization operational during the long COVID-19 era, so it was necessary to study its benefits and associated health problems to maximize job satisfaction, performance, and so gains for productivity.

In agreement with studies on characteristics of teleworkers [21, 22], this study showed that male employees are more likely to do telework than females. On the other hand, other studies dominate female teleworkers [23, 24]. These gender differences might be explained by different cultures and occupational sectors that implement telework. Other socio-demographic and job characteristics have been

Table 5
Relation between telework job satisfaction, recuperation, and some of the participants' characteristics

Characteristics	UWES-9S	<i>P</i> value	Recuperation	<i>P</i> value
Gender:				
Male	36.77 ± 9.50	0.000*	17.48 ± 1.58	0.019*
Female	29.70 ± 8.66		18.05 ± 3.30	
Educational level:				
Graduate	33.70 ± 6.99	0.879	17.61 ± 2.50	0.366
Post-graduate	33.56 ± 10.82		17.84 ± 2.52	
Marital status:				
Married	35.86 ± 8.96	0.000*	18.04 ± 2.02	0.000*
Not married	28.59 ± 7.79		17.05 ± 3.27	
Previous remote working experience before the COVID-19 period:				
Yes	34.93 ± 8.18	0.047*	16.46 ± 2.87	0.000*
No	33.003 ± 9.65		18.34 ± 2.07	
Type of workplace:				
Public	34.77 ± 10.93	0.071	17.45 ± 2.86	0.100
Private	33.04 ± 8.21		17.88 ± 2.31	
Employment status:				
Full-time	33.10 ± 9.53	0.009*	17.95 ± 2.55	0.000*
Part-time	36.27 ± 7.09		16.63 ± 1.95	
Amount of telework hours/week:				
< 40 hs	34.27 ± 8.90	0.031*	17.15 ± 2.93	0.002*
≥ 40 hs	32.15 ± 9.84		17.99 ± 2.26	

*Significant ≤ 0.05. †Values are expressed as mean ± SD, *t*-test used as a test of significance.

Table 6
Relation between telework job satisfaction, recuperation, and the associated health problems

Health problems	UWES-9S	<i>P</i> value	Recuperation	<i>P</i> value
With musculoskeletal problems	32.92 ± 9.50	0.003*	18.41 ± 2.32	0.000*
Without musculoskeletal problems	36.15 ± 7.74		15.32 ± 1.49	
With feelings of isolation	34.09 ± 5.00	1.000	18.24 ± 1.95	0.026*
Without feelings of isolation	33.45 ± 10.16		17.58 ± 2.64	
With chronic diseases	32.33 ± 11.79	0.014*	18.02 ± 2.74	0.047*
Without chronic diseases	34.58 ± 6.62		17.52 ± 2.31	
With visual problems	31.80 ± 10.54	0.000*	18.85 ± 1.73	0.000*
Without visual problems	35.24 ± 7.57		16.75 ± 2.68	
With sleeping disorders	32.46 ± 8.97	0.012*	18.32 ± 2.36	0.000*
Without sleeping disorders	34.73 ± 9.38		17.12 ± 2.53	
With work-related stress	33.18 ± 9.26	0.176	18.24 ± 2.13	0.000*
Without work-related stress	34.48 ± 9.17		16.75 ± 2.88	
With poor mental health	31.03 ± 9.54	0.000*	19.41 ± 1.79	0.000*
Without poor mental health	35.79 ± 8.40		16.33 ± 2.15	

*Significant ≤ 0.05. †Values are expressed as mean ± SD, *t*-test used as a test of significance.

investigated in past studies with contradicting conclusions that need to be further explored in future research [25].

The present study reported various benefits of teleworking as saving time and money, minimizing the spread of COVID-19, increasing independence, flexible working hours balancing work and life. Similar results were obtained by Harris [26], who reported that telework is the solution to work-family balancing problems, and Tremblay [27], who appreciated

the better organizations, the flexibility of teleworking hours, and saving time.

Recent studies [28, 29] reported the role of teleworking in limiting the spread of COVID-19 and reducing the number of newly infected cases. Also, other perceived telework benefits were reported in the previous study such as more concentration, fewer distractions, more autonomy, less cost, better work-time control, and so greater job motivation and satisfaction [30]. On contrary, other studies [31, 32] demonstrated

that telework may create a work-family conflict because of the blurring of boundaries between work and home time, and possible family member interference with work especially for those having minor children.

The current study demonstrated different health issues related to teleworking as musculoskeletal, work-related stress, sleeping disorders, visual problems, poor mental health, chronic diseases, and feelings of isolation. Similar findings were reported in previous studies [33–35] particularly musculoskeletal disorders which were linked to posture ergonomics risks usually associated with telework as awkward postures, repetitive movements, and a long period of continuous work without appropriate breaks which are important for musculoskeletal relaxation. Also, visual problems were reported from continuous use of video displays terminals while performing telework as shown by Nakazawa et al. [36]. Similarly, Thomée et al. [37] reported sleeping disorders and work-related stress, and Morahan-Martin and Schumacher [38] reported social isolation as a negative consequence of teleworking. However, today's easy and cheap communication technology via different audio/video conferencing facilitates social interaction, no matter where people are located [39].

In this study, we measured teleworking job satisfaction and recuperation on a specific scale and compared it to some participants' characteristics and associated health problems. Our results revealed that higher job satisfaction is common among male, married workers, working half time, previous remote working experience before the COVID-19, and those working less than 40hs/week. These findings could be explained by fact that Saudi Arabia was predominately a male-dominated country and males are usually given more responsibilities whether in life or job than their female counterparts and changing the office work to telework helped them more in facilitating their duties, managing their time and so better performance and job satisfaction. However, several previous studies reported higher job satisfaction for both male and female employees. These results might be related to different types of expectations from the job for male and female employees [40, 41].

In this study, female teleworkers, married, working full time, with no previous remote working experience before the COVID-19, and working more than 40 hs/week had significantly more perceived fatigue and less recuperation. These findings might likely be due to being most of them work in the private sector with too much workload, having minor children less

than 12 years without the availability of assistants or caregivers helping them. Moreover, as with starting the COVID-19 pandemic and associated lockdowns of schools, mandatory curfews, staying at home, and social isolation, all made the excessive burden on females at homes from increasing the number of her domestic duties in comparison to before COVID-19 besides adding a new load of distant education of minor children which is primarily done with the aid of mothers at homes.

As regards opinion toward preferring teleworking after COVID-19, more than half of our participants promoting telework. This finding could be explained by their higher job satisfaction and recuperation. Similarly, a study conducted by Buomprisco et al. [21] preferred telework and attributed that for being suitable for a variety of works and people of different ages, gender, and health status as motor disabled workers.

For those opposed permanent remote working attributed their reasons for technical failures, increased work amount, and salary reduction especially most of the participants working in the private sector and because of COVID-19 crisis, there was a ministerial resolution dated 6 April 2020 allowing the employers on either reducing employees' wages up to 40 percent for six months with a corresponding reduction in the work hours or placing them on paid annual leave, and or implement a period of unpaid leave [42]. Different telework perceptions might be related to the different country's affinity for technology, nature of occupational sectors, the availability and quality of Information Communication Technology infrastructure, and management culture [21].

5. Limitations

Being a cross-sectional design, we can't establish a cause-effect relationship, the study involves workers from one region, so the results can't be generalized across different regions or countries, this study was conducted during the COVID-19 crisis and did not examine whether the change in benefits, health problems and job satisfaction of teleworkers would outlast the pandemic. Further research is needed to examine the lasting impact of the COVID-19 pandemic on the use and perception of telework.

6. Conclusions

During the long COVID-19 era, telework practices become more important and represent one of

the permanent features of the future to sustain economic activities and increase productivity. Various benefits of teleworking were reported as saving time and money, minimizing the spread of COVID-19, and flexible working hours. Musculoskeletal disorders, work-related stress, sleeping disorders, and visual problems were the highest problems reported. All teleworkers with reported health problems showed significantly more perceived fatigue and less recuperation. More than half of the participants promoting telework post-COVID-19 era. Results of this survey would be useful to promote the health of teleworkers and enables the employers to be ready to adapt and satisfy the teleworkers' expectations to maintain their work and productivity.

Conflict of interest

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