

# The Relationship of Workplace Health Climate and Telework Status

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**Abstract:** During the COVID-19 pandemic, teleworking has become more widely used due to the necessity of maintaining employment and production while observing social-distancing mandates. Consequently, both employers and health professionals have become more interested in exploring the effects that teleworking has on employees. Workplace health climate is one measure that employers may use to assess employees' perceptions of workplace support for their health and well-being. Additionally, workplace health climate has been shown to impact employees' health behaviors and health outcomes. Therefore, the primary aim of this study was to determine the relationship between workplace health climate and the frequency of teleworking. The inquiry design was a needs assessment utilizing a survey consisting of 16 items. Respondents consisted of 1618 employees of a public university in the United States. Differences in workplace health climate scores based on telework frequency, age, and sex were analyzed for statistical significance. A Kruskal-Wallis test revealed a significant relationship between telework status and organizational support, supervisor support, and total workplace health climate scores. Additionally, there was a significant difference between the mean supervisor and peer support scores between age groups. There were no significant differences in workplace health climate scores between male and female employees. The findings from this study support existing literature that suggests remote working can be beneficial to employee health and well-being. To our knowledge, this is the first study to explore the relationship between workplace health climate and teleworking.

**Keywords:** Telework, Workplace Health Climate, COVID-19, Organizational Support, Employee Wellness

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## 1. Introduction

In March of 2020, COVID-19, an infectious disease caused by the SARS-CoV-2 virus, began rapidly spreading across the United States. Shortly thereafter, the World Health Organization declared the COVID-19 pandemic to be an international health crisis [1]. As a result, mandatory stay-at-home orders were issued in 42 states and territories of the United States, allowing only for "essential workers" to leave their homes to continue working [2]. This abrupt societal shift pressured employers to adapt to alternative modalities of work, resulting in an unforeseen rise in employees participating in telework [3]. Telework, also known as telecommuting or remote working, was defined by Allen et al. as "a work practice that involves members of an organization

substituting a portion of their typical work hours (ranging from a few hours per week to nearly full-time) to work away from a central workplace – typically from home – using technology to interact with others as needed to conduct work tasks" [4]. During the COVID-19 pandemic, 37.6% of the U.S. labor force who did not previously engage in telework reported transitioning to a telework arrangement [5]. The sudden rise in remote working has led employers, researchers, and health professionals to consider the consequences of teleworking on employees.

Existing literature regarding the effectiveness and impacts of teleworking are contradictory. Many studies have found that teleworking poses numerous benefits for both employers and their employees. Research has shown that employees feel more productive while working remotely when compared to

an office [6, 7]. Moreover, the flexibility provided to employees through remote work arrangements has been shown to increase employee job satisfaction, facilitate better care for dependent family members, reduce stress, and improve work-life balance [8]. One study found that remote workers were able to create better social support and distance themselves from negative work relationships more effectively than those who worked in-person [9]. Telework has also been shown to be beneficial for employers by allowing for improved task allocation, communication, management skills, planning, and work monitoring [10], in addition to reducing the financial burden of providing facilities for employees [8].

However, teleworking is not universally accepted as superior to working in-person. A recent study found that 74% of teleworkers studied reported having poor sleep quality, 30% reported having anxiety, and 18% reported experiencing depression [6]. Social isolation, which has been shown to be related to poor self-rated health, depression, musculoskeletal disorders, and various other health issues, is another negative consequence of teleworking [11]. Additionally, people who experience social isolation are more likely to have a poor diet and be physically inactive [11].

The present study focuses on the relationships between teleworking arrangements and workplace health climate, which is a measure of employees' perceptions of the extent to which their work environment promotes and supports their physical and mental health [12]. In this study, workplace health climate encompasses four domains: organizational support, supervisor support, peer support, and normative behavior [13]. An employee's perception of workplace health climate can impact their mental and physical health and can ultimately affect their performance. For example, a more favorable health climate has been associated with greater participation in health promoting activities and better health behavior [14]. The dramatic shift towards teleworking raises many questions, concerns, and opportunities related to workplace health climate.

## 2. Aims

The primary aim of the present study was to examine the relationships between workplace health climate and telework arrangements. This study further examined the relationships between age, sex, and workplace health climate. Ultimately, employers may use this information when determining which work arrangements are best suited for their organization.

## 3. Methods

### 3.1. Setting and Population

This investigation was performed at a public research university in the southeastern region of the United States with an accompanying academic medical center. The university employs over 20,000 people, each of whom is affiliated with one of the university's three operating

divisions: Academic, Medical Center, and Physician Group. In the present study, these operating divisions are referred to as "companies." The employees are situated across a broad range of occupational groups, including, but not limited to, facility management, health care, administration, and faculty.

### 3.2. Design and Instrumentation

The inquiry instrument has a 16-item survey comprising two sections. The first section includes three statements related to the employees' occupational characteristics. The third statement assesses the extent to which the employee engages in telework by way of 4 potential responses: ("I never work remotely", "I sometimes work remotely", "I mostly work remotely", or "I always work remotely"). The second section includes 13 statements that were adapted from previously validated health climate evaluation tools [13, 15] and assesses employees' perceptions of organizational support, supervisor support and peer support for their physical and mental health in addition to perceptions of normative health behaviors at the workplace. Responses to the 13 statements were reported by way of a 5-point Likert scale with responses ranging from strongly disagree to strongly agree.

### 3.3. Data Collection

Data collection occurred via a hyperlink to a survey electronically distributed through a university-wide newsletter, and advertised on a web-based employee wellness platform. Consequently, 1618 university employees voluntarily accessed the survey through a hyperlink, which provided them access to a survey that was created using Qualtrics software (Qualtrics, Provo, UT). In order to participate in the survey, employees were required to verify their identities using their Netbadge™ credentials. In addition to verifying employment status, the use of Netbadge™ allowed for the collection of demographics and job characteristics. This study was exempt from the review and monitoring of the university's Institutional Review Board. The researchers for this paper took every measure to use data responsibly and did not attempt to re-identify data.

### 3.4. Descriptive Statistics

All analyses, including descriptive statistics, were performed using SAS 9.4 software. Copyright ©2022 SAS Institute Inc. SAS and all other SAS Institute Inc. product or service names are registered trademarks or trademarks of SAS Institute Inc., Cary, NC, USA. Descriptive statistics were initially performed to improve understanding of the sample being studied, as well as provide insight for statistical analysis. Frequency counts and percentages are used in the present study to present descriptive statistics for categorical variables.

### 3.5. Primary Analysis

Survey participants categorized themselves as "always," "mostly," "sometimes," or "never" working remotely. They

then ranked statements associated with organizational support, supervisor support, peer support, and normative behavior using a 5-point Likert scale with responses ranging from “strongly disagree” to “strongly agree”. Responses were subsequently converted to a numerical value and scored as: 1=strongly disagree, 2=disagree, 3=neutral, 4=agree, and 5=strongly agree. The scores were calculated to find mean subscale scores for each category (organizational, supervisor, peer, and normative behavior).

For example, the organizational support category included three statements about the extent to which the institution 1) cares for employees’ physical and mental well-being, 2) provides opportunities for stress management, and 3) provides opportunities for physical health management. Each participant’s responses to these three questions were then averaged to produce their overall organizational support score.

Statistical analysis was conducted using SAS 9.4 software. The analysis began by dividing respondents into groups based on their telework status as described above. A SAS means procedure displayed the average total scores and subgroup scores and the standard deviations for these averages. Due to the non-normal distribution of the workplace health climate measures, a Kruskal-Wallis test was used to examine whether at least one group’s mean varied significantly from the means of the other groups. The Kruskal-Wallis test is a nonparametric alternative to the one-way analysis of variance (ANOVA) and does not assume that a dataset follows a certain distribution. If an ANOVA was used to analyze data that is not normally distributed, the likelihood of Type I error, also known as a false positive, would increase. The Kruskal-Wallis test assumes that 1) the dependent variable is ordinal or continuous, 2) the independent variable consists of two or more independent categorical groups, 3) independence of observations, and 4) similarly shaped distributions between the different groups.

## 4. Results

### 4.1. Differences in Responses by Telework Status

A total of 1618 employees responded to the 16-question survey between April and July 2021, and all but four provided information regarding their telework status.

Table 1 shows that of the 1618 respondents, 322 (19.90%) worked exclusively remotely, 296 (18.29%) worked mostly

remotely, 321 (19.84%) worked remotely occasionally, 675 (41.72%) never worked remotely, and 4 (0.25%) respondents did not disclose their telework status. Moreover, additional predictor variables were observed, including sex, age, company, and approximate yearly salary. The majority of respondents, 1194 (73.79%), were female, while 377 (23.30%) were male, and 47 (2.90%) did not disclose their sex. Among the various age categories, the largest proportion of respondents were between the ages of 55-64 (N=437, 27.01%), followed by 35-44 (N=368, 22.74%) and 45-54 (N=361, 22.31%). The age categories that comprised the smallest number of participants were the 18-24 category (N=37, 2.29%) and the 65+ category (N=61, 3.77%). Additionally, over half of the participants received an annual salary of \$74,000 or less (N=1007, 62.24%).

**Table 1.** Descriptive statistics of sample characteristics N=1618.

	N	%
Work Environment		
Always remote	322	19.90%
Mostly remote	296	18.29%
Sometimes remote	321	19.84%
Never remote	675	41.72%
No response	4	0.25%
Sex		
Male	377	23.30%
Female	1194	73.79%
No response	47	2.90%
Company		
Physician group	101	6.24%
Medical center	696	43.02%
Academic	821	50.74%
Age		
18-24	37	2.29%
25-34	307	18.97%
35-44	368	22.74%
45-54	361	22.31%
55-64	437	27.01%
65+	61	3.77%
No response	47	2.90%
Yearly Salary		
<50,000	477	29.48%
50-74,000	530	32.76%
75-99,000	307	18.97%
100-199,000	229	14.15%
200,000+	21	1.30%
No response	54	3.34%

**Table 2.** Differences in workplace health climate scores by telework status.

	Frequency of Telework				P-value*
	Always	Mostly	Sometimes	Never	
Total Score	3.92 ± 0.70	3.97 ± 0.67	3.79 ± 0.69	3.69 ± 0.81	<0.0001
Sub Scores					
Peer Support	4.01 ± 1.03	4.08 ± 0.96	3.96 ± 1.04	3.92 ± 1.07	0.2390
Supervisor Support	4.12 ± 1.04	4.16 ± 1.00	3.91 ± 1.10	3.74 ± 1.20	<0.0001
Organizational Support	4.20 ± 0.86	4.22 ± 0.85	3.89 ± 0.94	3.68 ± 1.10	<0.0001
Normative Behavior	3.32 ± 0.76	3.44 ± 0.75	3.41 ± 0.73	3.42 ± 0.86	0.1035

All scores are presented as means and standard deviations (mean ± sd).

\* Denotes unadjusted p-value from the Kruskal-Wallis test.

Table 2 describes differences in total scores and subscores based on the extent of telework. The p-values were derived from a Kruskal-Wallis analysis and represent the likelihood that the differences in group means could have been caused by chance. At an alpha level of  $p < 0.05$ , the standard for statistical analysis, at least one group had a statistically significantly different mean for total score, organizational support, and supervisor support. There was no evidence of a statistically significant difference in mean scores for peer

support or normative behavior.

Table 3 describes differences in total scores and subscores by age group. The p-values were derived from a Kruskal-Wallis test. At an alpha level of  $p < 0.05$ , at least one group had a significantly different mean for peer support and organizational support. There was no evidence of a statistically significant difference in mean scores by age group for supervisor support, normative behavior, or total scores.

**Table 3.** Differences in workplace health climate scores by age category.

	Age Group						P-value*
	18-24	25-34	35-44	45-54	55-64	65+	
Total Score	3.78 ± 0.89	3.79 ± 0.74	3.83 ± 0.73	3.76 ± 0.74	3.81 ± 0.75	4.04 ± 0.66	0.1107
Sub Scores							
Peer Support	3.91 ± 1.18	4.06 ± 1.00	4.07 ± 0.98	3.89 ± 1.07	3.88 ± 1.07	4.21 ± 0.94	0.0141
Supervisor Support	3.96 ± 1.25	3.90 ± 1.15	3.98 ± 1.08	3.84 ± 1.16	3.94 ± 1.13	4.19 ± 0.98	0.2278
Organizational Support	3.64 ± 1.12	3.72 ± 1.06	3.90 ± 1.00	4.00 ± 0.98	4.07 ± 0.96	4.16 ± 0.84	<0.0001
Normative Behavior	3.62 ± 0.89	3.47 ± 0.85	3.37 ± 0.78	3.31 ± 0.80	3.37 ± 0.75	3.59 ± 0.65	0.0695

All scores are presented as means and standard deviations (mean ± sd).

\* Denotes unadjusted p-value from the Kruskal-Wallis test.

#### 4.2. Post-Hoc Analysis

If the Kruskal-Wallis analysis determined there was a statistical significance between at least two of the groups, a Dwass, Steel, Critchlow-Fligner (DSCF) multiple comparison was used to determine the groups between which there was a statistically significant difference of means. The DSCF multiple comparison, based on pairwise, two-sample rankings, allows for significant difference in mean scores between specific groups to be determined.

After discovering a significant relationship between telework status and organizational support, supervisor support, and total support scores, a DSCF multiple comparison was used to further understand the findings of the initial analysis by comparing mean workplace health climate scores between pairs of telework status groups. For organizational support, all telework status groups were significantly different from one another aside from the “always” and “mostly” remote groups, and the “never” and “sometimes” remote groups. For supervisor support, the mean scores of the “always” and “mostly” remote groups differed significantly from the “never” remote group ( $p < 0.0001$ ). Additionally, the “sometimes” and “mostly” remote groups had significantly different means when compared to one another ( $p = 0.0292$ ). The pairwise comparisons for total score were consistent with those for supervisor support.

Moreover, DSCF multiple comparisons were used to further examine the relationships between the various age groups in regard to both organizational and peer support. According to the multiple comparisons, the 25-34-year-old age group had a significantly different mean organizational support score than the three oldest age groups, 45-54, 55-64, and 65+. There were no significant differences between any other age groups. Additionally, the DSCF multiple

comparisons revealed that there were no significant differences in peer support scores between any age groups. This may seem contradictory to the initial Kruskal-Wallis analysis, which indicated that at least one group has a significantly different mean from at least one other group. However, the DSCF multiple comparison procedure is more conservative than the Kruskal-Wallis test, meaning that the null hypothesis is less frequently rejected.

## 5. Discussion

The primary aim of this study was to examine the relationship between the workplace health climate and telework amongst university employees. Our results revealed statistically significant differences between the mean scores of organizational and supervisor support based on the extent of telework. Employees who mostly or always work remotely perceived greater support from their supervisor and the organization compared to those who sometimes or never work remotely. Furthermore, those who mostly work remotely appear to perceive a similar level of support as those who always work remotely. These findings lend support to earlier research which postulates that if employers trust and allow employees to work remotely, employees feel as though they have greater autonomy and a more positive work-life balance, and in turn, appraise their work environment more favorably [16]. Additionally, our findings support prior literature which suggests teleworking is positively associated with employees' commitment to their organization and their supervisor. [17, 18].

Surprisingly, there was no statistically significant difference in perceptions of peer support between the telework groups. Prior research suggests employees who frequently work remotely are more likely to feel isolated or disconnected from their peers [19], and that teleworking

reduces cohesiveness among employees, which can negatively impact collaboration [20]. However, the university employees who responded to this survey ranked peer support relatively high compared to total scores, and a Kruskal-Wallis test revealed no significant differences based on the extent and frequency of telework. Explanations for these results may be that the university fosters positive coworker relationships regardless of work arrangements, or that existing coworker relationships were sustained or flourished despite teleworking.

The normative behavior construct included statements such as, “My coworkers strive to be physically active during work hours,” and “My coworkers strive to include fruits and vegetables in their means.” Because employees who work remotely have fewer opportunities to observe their coworkers’ daily health behaviors than those who work in-person, it was initially surprising that there was no statistically significant relationship between normative behavior scores and frequency of telework. However, closer examination of the responses revealed a roughly normally distributed range of scores from 1 to 5 for every group, which may indicate that respondents were unsure about how to answer these questions or were ambivalent in their responses regardless of their work environments.

Total workplace health climate scores had a significant relationship with telework frequency and closely reflected the aforementioned findings. Those who worked mostly remotely displayed the highest total scores, followed by those who worked exclusively remotely, sometimes remotely, and never remotely. Our findings also suggest that there is no perceived benefit to an exclusively remote work arrangement when compared to one that is mostly remote. Likewise, there does appear to be a meaningful difference between never working remotely and sometimes working remotely. Thus, it can be concluded that employees who spend the majority of their working hours teleworking perceive their workplace health climate more favorably than those who spend the majority of their working hours in-person.

A secondary aim of this study was to examine the relationship between workplace health climate and age. Our findings show that organizational support and peer support were the only workplace health climate domains that had a statistically significant relationship with age.

According to the multiple comparisons of the analysis, the 25-34-year-old age group exhibited significantly lower organizational support scores than the age groups comprised of individuals 45 years-old and older. This could be explained by younger employees, in general, having less work experience, making less money, or generational differences in personalities compared to the older age groups. This finding may also be related to a previous study which found that older employees reported greater resilience than younger employees [21]. Conversely, other research has shown employees under the age of 25 report higher job satisfaction than employees between the ages of 31 and 65, which contradicts our findings [22].

Furthermore, there was a significant difference in mean

peer support scores between the age groups. However, the post-hoc analysis did not reveal the groups between which this difference lies. We surmise the variance in mean peer support scores between age groups is attributable to different life situations that coincide with age. For example, adults between 25-44 reported a higher mean peer support score than the other age categories, excluding the 65+ age category. One possible explanation for this finding is that individuals between the ages of 25 and 44 are more likely to be raising children, which could be linked to increased social interactions. According to the Pew Research Center, the median age at which a mother births their first child in the United States was 26 years [23]. Additionally, prior literature suggests having children can broaden and strengthen a parent’s social network [24, 25]. Moreover, it was surprising to find that adults aged 65 and older had the highest mean peer support score of the various age categories, since adults of this age range are more likely to experience social isolation than their younger counterparts [26]. However, some research suggests that being employed at an older age can serve as a protective factor against the social isolation that is normally observed among older adults [27]. Similarly, younger adults may be faced with the competing demands of school or a second job, preventing them from creating meaningful relationships with their coworkers. This may explain why participants between the ages of 18 and 24 exhibit a relatively low mean peer support score.

## 6. Limitations

Ultimately, the survey design utilized for this study is not without limitations. Firstly, the Likert scale can be subject to individual personalities—one person’s “strongly agree” may be another person’s “agree,” and people may choose “neutral” if they do not understand the question rather than not responding at all.

It is also important to note the novelty of the survey used in our investigation – which included statements adapted from previously validated health climate assessments [13, 15]. To reduce participant attrition and minimize the time needed for completion, the survey was also abbreviated, which limits the scope of assessments.

Additionally, surveys can be subject to response bias, especially if employees feel their responses are being monitored by their employer. Lastly, the results for normative behavior were limited by remote employees’ inability to observe their peers’ health behaviors. Based on these limitations, a modicum of caution should be exercised when translating the results of this study.

## 7. Conclusion

The results of this study suggest that telework status may be associated with perceptions of hierarchical support, including support from supervisors and the larger organization, but not with peer support or normative behavior.

Because this study revealed that employees who never or sometimes worked remotely ranked supervisor and organizational support the lowest, employers similar to the one studied might consider implementing policies or practices that increase perceived support for all employees, but with a particular emphasis on those working onsite. As pandemic conditions abate and more employees return to a traditional work modality, strong relationships between employees of all levels will be crucial for the transition process and adjustment to in-person work. The results of this study suggest that co-worker relationships are strong regardless of telework, and organizations should continue fostering these relationships to promote a positive work environment.

Further research may replicate this study in different workplace environments, such as offices in other business areas, smaller universities, and workplaces where teleworking may be more or less common in non-crisis times. Future studies may also complement this work by assessing employees' perceptions of different areas of support or other factors related to workplace health climate. A prospective cohort study observing the workplace health climate scores of employees engaging in different levels of telework could be used to further explore the research question of the present study. Additionally, qualitative research, consisting of interviews or focus groups, would be useful in assessing the perceptions of employees on various work environments. Lastly, future research may address differences in personality or other circumstances that indicate a proclivity for telework.

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