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Presenteeism and home-based Telework across the Visegrad countries during the COVID-19 Pandemic: A Multivariate Analysis Approach

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Abstract:

Objective: The purpose of this study is to analyse the factors that contribute to presenteeism in the Visegrad countries during the COVID-19 pandemic. The study specifically focuses on the influence of different levels of telework utilization (no telework, occasional telework, and frequent telework) on the probability of presenteeism.

Methods: The analysis included data from the European Working Condition Telephone Survey (EWCTS) carried out in 2021, which involved 1806 individuals from the Visegrad nations. Logistic regression models were used for calculation.

Main results: The study discovered that regular telework increases the chances of presenteeism, where those who frequently or consistently telework are more likely to work while being ill. Emotional exhaustion, managerial support, and collegial support was found to be a significant indicator of presenteeism. Furthermore, the combination of working at high speed and facing tight deadlines was found to be linked to increased presenteeism, particularly for individuals who often or always telework.

Conclusion: The results emphasize the intricate connection between telework and presenteeism in the Visegrad nations during the pandemic. This study highlights the significance of dealing with these aspects, especially in the context of the growing adoption of telework, in order to uphold employee well-being and productivity.

Keywords: *Presenteeism, COVID-19, work, telework, Visegrad countries*

JEL Codes: *I12, I14, I31, J24, M12*

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Introduction

Teleworking is gaining significance in the delivery of work services. It has especially increased in importance during the COVID-19 pandemic compared to its pre-pandemic significance (Steidelmüller et al., 2020, p. 998). Telework or telecommuting is seen as a working arrangement in which employees of an organization do (at least) part of their regular working hours remotely – primarily at home (Allen et al., 2015).

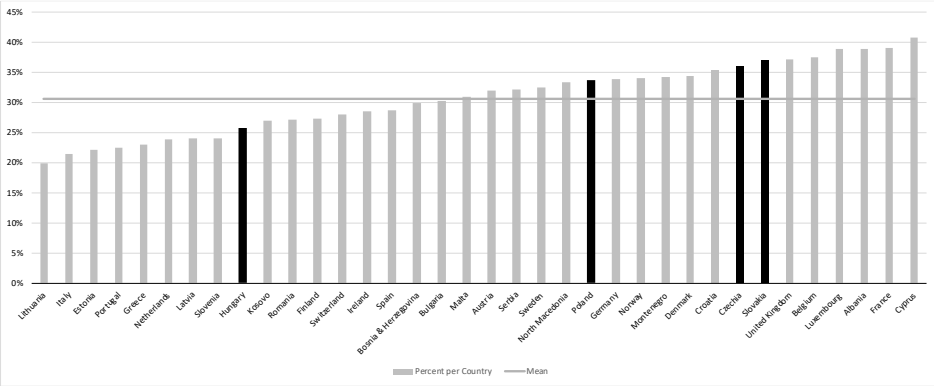
Prior to the pandemic, it was discovered that the prevalence of telecommuting in Visegrad countries was quite low (between 1.2% and 4.6% who usually telework). The prevalence of this phenomenon has escalated in the majority of regions due to the COVID-19 pandemic (Eurostat, 2024).

During the height of the COVID-19 epidemic, forecasts suggested that even after the pandemic recedes, it is expected that around 25% – 30% of people will persist in working remotely for multiple days each week (Global Workplace Analytics, 2021 as cited in Ruhle & Schmoll, 2021). In contrast, the data for the Visegrad Group countries reveals that the proportion of telecommuting in these nations is lower than the previously anticipated level. Despite a significant increase in the use of telework, the number of individuals practicing has declined since reaching its peak in 2021. Nevertheless, it continues to exist at a level that surpasses what was previously observed prior to the pandemic.

The investigation of the relationship between presenteeism, the situation in which an employee goes to work despite illness, and telework, is still an under-researched area (Ruhle & Schmoll, 2021; Schmitz et al., 2023; Steidelmüller et al., 2020). This is particularly relevant for the Visegrad countries, as there is currently no study that examines this relationship. In general there are only a few studies that deal with the overall occurrence of presenteeism (Juszczyk et al., 2018; Kotomska et al., 2023; Landovská & Karbanová, 2023; Mikos et al., 2020; Olejniczak et al., 2023).

An analysis of presenteeism rates in the Visegrad Group nations, compared to other countries participating in the European Working Condition Survey in 2021, revealed that Hungary had the lowest presenteeism rates among the Visegrad Group countries. The Czech Republic and Slovakia exhibit comparably elevated figures, above the average for all countries.

Graph 1: Rates of presenteeism per country 2021



Source: (Eurofund, 2024)

There are currently a number of studies that have analysed presenteeism, often in on-site settings. However, the relationship between telework and presenteeism has not yet been analysed. This is particularly true for the countries of the Visegrad Group. The importance of this issue is demonstrated by the fact that presenteeism has an impact on the health and well-being of employees, their productivity and ability to work, and on the organisations themselves (Demerouti et al., 2009; Hansen & Andersen, 2009; Lu, Lin, et al., 2013; Niven & Ciborowska, 2015). The aim of this study is to identify the particular attributes that raise the probability of presenteeism in the Visegrad countries. As mentioned above, there are only a few studies on presenteeism for the Visegrad Group. There are no studies at all on the relationship between presenteeism and telework. This study therefore attempts to close this research gap and in addition in analysing the variations in these parameters among different groups with different telework arrangements. This was especially significant considering the widespread presence of the COVID-19 epidemic during that period.

Literature Review

Presenteeism

Presenteeism as a subject of research became more relevant at the beginning of the 1980s. The scope of the studies varied in terms of the definition of the

phenomenon of presenteeism. What they had in common, however, was that they focused on people physically attending work despite being ill (Lohaus & Habermann, 2018). Presenteeism is seen as the opposite of absenteeism: That is, the phenomenon of not showing up at work due to illness, but going on sick leave (Gerich, 2016). In contrast to the US research tradition, which tends to focus on the influence of illness on work productivity, European presenteeism research is primarily interested in investigating the motives for this behaviour. European studies primarily examine personal, work-related and organisational factors that may have an influence on the likelihood of presenteeism occurring (Lohaus & Habermann, 2018).

The relevance of this topic – considering the prevailing COVID-19 pandemic at the time – shows that presenteeism can have a major impact on employees. This is demonstrated by various studies that have shown that the phenomenon of presenteeism can have a lasting impact on the future health of employees (Bergström et al., 2009; Gustafsson & Marklund, 2011; Skagen & Collins, 2016). An employee's presenteeism also affects their colleagues by possibly compensating for reduced performance or through possible infection. Presenteeism also harbours risks for society as a whole through possible increased payments of sickness benefits as a result of a deteriorating state of health in the future (Lohaus & Habermann, 2018).

Influencing factors on presenteeism

Various studies dealing with the topic of presenteeism have analysed different influencing factors. Against the background of teleworking during the pandemic in particular, the factors that could potentially have an influence on the likelihood of presenteeism occurring are discussed below.

Job demands, especially long working hours and other potentially stress-inducing working conditions such as time pressure, can also cause employees to work sick (Hansen & Andersen, 2008; Lu & Cooper, 2022; McGregor et al., 2016; Merrill et al., 2012). Employees who are confronted with challenging circumstances with high job demands (e.g. deadlines, working at high speed) feel obliged to be present even in the event of illness. Studies have shown that autonomy has a cushioning effect in everyday working life for employees who have a high level of job control. People who are able to better meet existing job demands through existing autonomy in the workplace can utilise this flexibility as a resource (Johansson et al., 2015). If employees are not equipped with job control, this can lead to them using presenteeism as a

possible coping strategy to react to high workloads and keep their productivity levels high (Caverley et al., 2007).

High workload and working conditions also influence the perception of emotional exhaustion. The relationship between emotional exhaustion and presenteeism was also analysed in a meta-analysis (Miraglia & Johns, 2016) as well as in a cross-cultural context for China and the UK (Lu et al., 2013). One study showed that emotional exhaustion and presenteeism are related and furthermore, the authors were able to show that work engagement mediates this relationship and reduces the negative effects from productivity loss due to presenteeism (Ferreira et al., 2019). However, the studies on the relationship between presenteeism and work engagement are ambiguous. People who have a high level of work engagement are characterised by high energy levels, resilience and high attachment, among other things (Mazzetti et al., 2023). Some studies have shown that presenteeism is positively related to work engagement (Kinman & Wray, 2018; Miraglia & Johns, 2016). In this context, people with high work engagement levels show more presenteeism due to their high attachment and energy levels and are also at work during illness. Other studies found, that employees with higher levels of work engagement show less presenteeism compared to employees with medium or lower levels of work engagement (Burton et al., 2017).

Job insecurity is seen as a predictor that has been analyzed in some studies. These studies were able to show that the insecurities experienced in their own job can influence the presenteeism behaviour of employees (Kim et al., 2020; Miraglia & Johns, 2016; Schmidt & Pförtner, 2020). A study by Reuter et al. calculated an influence of job insecurity from the perspective of regional unemployment on the basis of 232 regions in Europe (NUTS-2). Presenteeism was particularly the case for people with low salaries and low skill-level positions (Reuter et al., 2021). The insecurity experienced by employees is compensated for by increased presenteeism behaviour. This leads people to go to work even when they are ill.

Support and workplace social capital as a job resource play a major role in this context, as various studies have shown that support in the workplace can reduce the risk of presenteeism (Janssens et al., 2015; Schmitz et al., 2023). Thus, the manager also plays an important role in the presenteeism behaviour of employees. If the relationship between employees and managers is perceived as strained, this can potentially increase presenteeism (Ruhle & Schmoll, 2021). The manager plays a moderating role here and influences the relationship between employees and presenteeism. If people

report low levels of support from the manager, and employees are unable to utilise workplace social capital as a ressource, this leads to increased presenteeism compared to employees who report higher levels of support (Caers et al., 2021; Mazzetti et al., 2019; Mori et al., 2022). However, it is not only managers who can exert an influence here, but also cooperation with colleagues (Goto et al., 2020; Miraglia & Johns, 2016). Experienced support from colleagues is seen as reducing the feeling of pressure and therefore reduce the occurrence of presenteeism (Baeriswyl et al., 2017; Gosselin et al., 2013; Leineweber et al., 2011).

In addition to the variables just mentioned, socio-demographic factors were researched in prior studies. However, the results are ambiguous. The influence of gender on the probability of presenteeism was analysed in the study by Luksyte et al. show that men are more inclined to work sick in order to safeguard their performance. Women, on the other hand, protect their health more than men and show a higher health protective motive, which leads to less presenteeism (Luksyte et al., 2023). Other studies have found a higher tendency for presenteeism in women (Aronsson et al, 2000; Aronsson & Gustafsson, 2005; Cho et al, 2016; Gustafsson Sendén et al, 2016; Leineweber et al, 2011). Some studies have found no effect of gender on the occurrence of presenteeism (Gosselin et al., 2013; Gustafsson & Marklund, 2011).

The influence of age on the occurrence of presenteeism has also come to different conclusions in various studies. Leineweber et al. (2011) found an increased probability of presenteeism in the 35-54 age group. A similar result was found in Cho et al. (2016) were discovered for those aged 30 and over. This contrasts with the result of Allemann et al. (2019) who were able to show that the probability of presenteeism decreases with increasing age. A similar conclusion was reached by Aronsson & Gustafsson (2005) came to the conclusion that presenteeism occurs more frequently in the 16-35 age group.

Finally, the influence of the education level on the occurrence of presenteeism is discussed. Some studies have shown that presenteeism tends to be associated with people who have fewer years of education (Cho et al., 2016; Gustafsson & Marklund, 2011; Preisendörfer, 2010). Other studies were unable to prove the influence of education on presenteeism: The comparative study by Johansen (2012) was able to calculate an influence of education in Norway, but not for Sweden. Likewise Caers et al. (2021) found no influence of education on presenteeism in their study of employees in Belgium.

Telework and presenteeism

In general the relationship between telework and the health of employees varies according to different job characteristics and different contextual and technological variables. Teleworking can have a positive effect on the health of employees (e.g. lower blood pressure and lower general health risks). However, it has been shown that longer working hours or working at atypical working hours can lead to increased stress levels. The reduced social networking caused by teleworking can also have a negative impact on employees' well-being. It should also be noted that the blurring of boundaries between work and private life, which tends to be more difficult to maintain in the case of teleworking, can also lead to an increased perception of stress (Beckel & Fisher, 2022). Other studies have found, that home-based telework leads to a change in the employee behaviour (e.g. working in leisure time or working despite illness). The design and organisation of telework also influences the well-being of employees (Goñi-Legaz et al., 2024; Miglioretti et al., 2023).

With focus on the relationship between presenteeism and telework there is a small number of studies. Studies were able to prove that there is a positive correlation between home-based telework and (virtual) presenteeism for all participating countries by analysing the EWCS data from 2015. The incidence of presenteeism increases with the intensity of telework (Eurofund, 2020; Steidelmüller et al., 2020). A further study for german employees was able to prove that presenteeism is a widespread phenomenon among those who utilize telework options. People find it easier to work despite sick leave if they work from home. The authors conclude that employees are more inclined to presenteeism when they work remotely than when they have to work on-site. It also shows that a lack of support from supervisors is associated with more presenteeism (Schmitz et al., 2023). The importance of social interactions during telework was also identified in another study. Especially during peak phases of the pandemic and social isolation, this can increase presenteeism (Otsuka et al., 2024). Similarly, a greater workload in times of remote working is fuelling an increase in presenteeism (Fiorini, 2024).

Derivation of the hypotheses

Presenteeism, the behaviour of employees to go to work despite illness, is influenced by a variety of job demands (e.g. time pressure, workloads), as well as job resources (e.g. job control, social support). These results relate

primarily to on-site settings. There are only a few studies that deal with the relationship between telework and presenteeism. Especially, there is a lack of studies investigating this issue for the Visegrad countries.

The aim of this article is to analyse the user groups of telework arrangements in order to calculate which influencing factors increase the probability of presenteeism for the group of the Visegrad countries. The data set of the European Working Condition Telephone Survey (EWCTS) from 2021 was used for this purpose. The following hypotheses were formulated for the statistical calculation on the basis of the analyses presented above:

H1: There is a statistically significant relationship between the degree of telework utilization and presenteeism.
H2: There is a statistically significant relationship between support from the manager and the likelihood of presenteeism occurring.
H3: There is a statistically significant relationship between support from colleagues and the likelihood of presenteeism occurring.
H4: There is a statistically significant relationship between the weekly working hours and the probability of presenteeism occurring.
H5: There is a statistically significant relationship between the necessary speed of work (tempo) and the probability of presenteeism occurring.
H6: There is a statistically significant relationship between the existence of tight deadlines and the probability of presenteeism occurring.
H7: There is a statistically significant relationship between the extent of job control and the probability of presenteeism occurring.
H8: There is a statistically significant relationship between emotional exhaustion and the likelihood of presenteeism occurring.
H9: There is a statistically significant relationship between work engagement and the probability of presenteeism occurring.
H10: There is a statistically significant relationship between the job insecurity experienced and the probability of presenteeism occurring.

In addition, three control variables are also utilized to compute an additional model: gender, age and education level

Method

Datasets and Participants

Instruments

The analysis was conducted using data from the European Working Condition Telephone Survey (EWCTS) performed from March to November 2021. The dataset consists of a total of 8476 people, including 1990 from the Czech Republic, 1792 from Hungary, 2900 from Poland, and 1794 from Slovakia. After data screening the working sample included 1806 participants.

Dependent variable

With regard to presenteeism, participants were asked the following questions: "Over the past 12 months did you work when you were sick?" or, if the employment relationship had lasted less than 12 months, "Since you started your job, have you worked when you were sick?" ("Yes", "No", "I was not sick", "Don't know" and "Refused"). The variable "Presenteeism" was dichotomized (1=yes, 0=no presenteeism); the following items were excluded from the analysis: "I was not sick", "Don't know" and "Refused".

Independent variables

The EWCTS contains a series of questions that are used to answer the previously established hypotheses.

The degree of home-based telework was computed by recoding the variable "loc_home". The following categories were formed: 1="no/rarely telework", 2="occasional telework", and 3="often/always telework". The category "don't know" was excluded from the analysis.

Support from one's own manager was categorized by the statement "Your manager helps and support you" (from "never" to "always"); whereby "don't know", "refused" and "not applicable" were not taken into account for the calculation. The categories were then recoded and summarized as follows: 1="never or rarely", 2="sometimes", 3="often or always".

The variable "Support from colleagues" was treated in a similar way: The statement "Your colleagues help and support you" (from "never" to "always"); "don't know", "refused" and "not applicable" were not taken into

account for the calculation, was used to determine the degree of support from colleagues. The answer options were subsequently recoded and summarized: 1="never or rarely", 2="sometimes", 3="often or always".

The number of hours usually worked per week was asked by means of the following question: "How many hours do you usually work per week in your main paid job" (in hours per week). The categories "Don't know" and "Refused" were not included in the analysis.

To investigate the question of whether a fast pace of work and the existence of tight deadlines have an influence on the probability of presenteeism occurring, the following questions were asked: "[...] does your (main) job involve working at very high speed?" and "[...] does your (main) job involve working to tight deadlines?" (from "never" to "always"); "don't know" and "refused" were not taken into account for the calculation. The response options were subsequently recoded and summarized: 1="never or rarely", 2="sometimes", 3="often or always".

To calculate the influence of job control (α=0.746), three variables were combined to form an index that measures the respective autonomy of the employees. Job control was measured by the ability to influence the work process, the choice of methods for completing work and the adjustment of work speed. The scale for these three items ranges from 1 to 5. The measurement instrument from Breaugh (1985) was used.

The degree of experienced emotional stress was assessed using the following statement: "I feel emotionally drained by my work" (from "never" to "always"); "don't know" and "refused" were not taken into account for the calculation. The answer options were subsequently recoded and summarized: 1="never or rarely", 2="sometimes", 3="often or always".

The degree of work engagement was measured by creating an index variable (α=0.654). Three statements were presented: "At my work I feel full of energy", "I am enthusiastic about my job" and "Time flies when I am working" (from "never" to "always"); "don't know" and "refused" were not taken into account for the calculation. The scale for these three items ranges from 1 to 5. The creation of the index is based on the valid and reliable instrument from Schaufeli et al. (2019).

The degree of job insecurity experienced was measured using the following statement: "I might lose my job in the next 6 months." ("strongly agree" to "strongly disagree"); "don't know" and "refused" were not taken into account for the calculation. The response options were subsequently recoded and summarized: 1="(strongly) agree", 2="neither agree nor disagree", 3="(strongly) disagree".

Furthermore, "Gender" with 1="Men" and 2 "Woman", age by "Age in years", whereby "don't know" and "refused" were not taken into account in the analysis, as well as "Education". The highest completed level was recorded for "Education". The answers were collected using the ISCED 2011 logic: 2="Secondary education" and 3="Tertiary education". Category 1="Primary education" was not included in the analysis due to the insufficient number of cases.

Data Analysis

First, the relationship between presenteeism and the respective degree of telework utilization was calculated for a group comparison using a chi-square test. In a further step, logistic regressions were calculated to determine the probability of occurrence. The SPSS statistics programme (Version 29) was used for this. The items used for the analysis were recoded in a first step and prepared for the calculation using logistic regression. In order to check the data for collinearity and Mahalanobis, a linear regression was calculated in advance. Outliers and missing variables were excluded. At the end of this process, 1806 people were included in the analysis. Different logistic regression models were calculated (M0 to M5): In addition to a zero model (M0), a telework model (M1), an overall model (M2) and a separate model for each telework utilisation group were calculated (M3-M5).

Results

Preliminary Analyses

The descriptive data Table 1. indicates that approximately 31% of the interviewees exhibited presenteeism within the last 12 months. More than 50% never or rarely used telework, almost 13% sometimes and more then 36% used often or always home-based telework. The average rating for the support received from superiors and colleagues was deemed satisfactory. The average number of hours worked per week, as reported by the survey participants, is 41.

Typically, a greater number of individuals are impacted by fast work pace and strict time limits. The Cronbach's α coefficient of job control is 0.746, indicating that the interviewees had a greater average level of job control. The interviews exhibit emotional stress levels that are below normal, with

an average score of 1.78. The average work engagement score (Cronbach's α = 0.654) is 3.86. This signifies a level of work involvement that is higher than normal.

The following table shows the descriptive statistics of the variables used.

Table 1: Descriptive analysis (range, means, standard deviation and Cronbach's α)

	Range	Mean	SD	Cronbach's α
Presenteeism (Yes/No)	0-1	0.3138	0.46418	-
Telework (Degree of Utilization)	1-3	1.8544	0.92187	
Support of manager	1-3	2.5997	0.70060	-
Support of colleagues	1-3	2.7307	0.59635	-
Usual working hours per week	1-168	40.1748	9.93074	-
Working high speed	1-3	2.2547	0.80654	-
Working tight deadlines	1-3	2.2881	0.81851	-
Job control (Index)	1-5	3.2508	1.13520	0.746
Emotional exhaustion	1-3	1.7855	0.79975	-
Work engagement (Index)	1-5	3.8078	0.75089	0.654
Job insecurity	1-3	2.5877	0.71838	-
Gender	1-2	1.52	0.501	-
Age	16-88	41.0945	11.32879	-
Education	2-3	2.5981	0.49041	-

Note: Own calculation based on the EWCTS 2021

The participants are nearly equally distributed between males and females, with a slight majority of 51% being men and 49% being women. The respondents had an average age of approximately 42 years. Approximately 58% of the population have a tertiary education

Comparative analysis of telework utilization and presenteeism

When comparing the three groups in terms of telework utilization, statistically significant differences were found between the three groups:

A chi-square test of independence was performed to evaluate the relationship between presenteeism and the degree of telework utilization. The relationship between these variables was significant [$\chi 2$ [(2], N = [1806]) = [16.598], p = <0.001].

The analysis shows that people who use telework at least occasionally show presenteeism more often than the group of people who never do so.

A logistic regression was conducted to determine if the degree of telework utilization is a predictor of presenteeism. Data screening led to the elimination of several outliers. Regression results indicated that the overall

model fit of the predictor got better in comparison with the zero model (-2 Log likelihood = 2232.432, zero model = -2 Log likelihood = 2255.888) and was statistically reliable in distinguishing between presenteeism [$\chi^2(2)$ = 16.615, p <0.001]. The model correctly classified 68.5% of the cases. Regression coefficients are presented in Table 2. Wald statistics indicated that the degree of telework utilization predict presenteeism.

Table 2: Logistic Regression – Model 1 (degree of telework utilization as only independent variable)

	B	Wald	df	p	Odds Ratio
Degree of telework utilization					
No/rarely telework	Ref.	Ref.	Ref.	Ref.	Ref.
Occasional telework	0.411	6.910	1	0.009**	1.509
Often or always telework	0.415	14.220	1	<0.001**	1.515

Note: Own calculation based on the EWCTS 2021; (*) Correlation is significant at the 0.1 level (two-tailed); *Correlation is significant at the 0.05 level (two-tailed); **Correlation is significant at the 0.01 level (two-tailed); N = 1806; Nagelkerke R^2 = 0.013

Factors influencing presenteeism – categorized based on telework utilization

A second logistic regression was conducted to determine which independent variables are predictors of presenteeism. Data screening led to the elimination of several outliers. Regression results indicated that the overall model fit of the predictors was better compared to the zero model (-2 Log likelihood = 2059.962, zero model = -2 Log likelihood = 2255.888) and was statistically reliable in distinguishing between presenteeism [$\chi^2(20)$ = 189.084, p <0.001]. The model correctly classified 69.5% of the cases. Regression coefficients are presented in Table 3. Wald statistics indicated that degree of telework utilization, support of manager, support of colleagues, working high speed, working tight deadlines, experience of emotional exhaustion, and age significantly predict presenteeism.

A third logistic regression was conducted to determine which independent variables are predictors for presenteeism for those who do not (or cannot) telework. Data screening led to the elimination of several outliers. Regression results indicated that the overall model fit of the predictors was better compared to the zero model (-2 Log likelihood = 989.956, zero model = -2 Log likelihood = 2255.888) and was statistically reliable in distinguishing

Table 3: Logistic Regression – Model 2 (Overall model)

	B	Wald	df	p	Odds Ratio
Degree of telework utilization					
No telework	Ref.	Ref.	Ref.	Ref.	Ref.
Occasional telework	0.397	5.425	1	0.020**	1.487
Often or always telework	0.371	0.127	1	0.003**	1.449
Support of Manager					
Never of rarely	Ref.	Ref.	Ref.	Ref.	Ref.
Sometimes	-0.107	0.282	1	0.595	0.899
Often or always	-0.360	4.045	1	0.044*	0.698
Support of Colleagues					
Never or rarely	Ref.	Ref.	Ref.	Ref.	Ref.
Sometimes	0.283	1.368	1	0.242	1.327
Often or always	-0.220	1.115	1	0.291	0.802
Usual working hours	0.004	0.580	1	0.446	1.004
Working high speed					
Never or rarely	Ref.	Ref.	Ref.	Ref.	Ref.
Sometimes	0.209	1.516	1	0.218	1.233
Often or always	0.493	9.469	1	0.002**	1.638
Working tight deadlines					
Never or rarely	Ref.	Ref.	Ref.	Ref.	Ref.
Sometimes	0.270	2.381	1	0.123	1.310
Often or always	0.337	3.201	1	0.036*	1.401
Job control (Index)	-0.090	3.201	1	0.074(*)	0.914
Experience of emotional exhaustion					
Never or rarely	Ref.	Ref.	Ref.	Ref.	Ref.
Sometimes	0.744	32.887	1	<0.001**	2.104
Often or always	1.007	48.796	1	<0.001**	2.738
Work engagement (Index)	-0.096	1.577	1	0.209	0.908
Experience of job insecurity					
(Strongly) agree	Ref.	Ref.	Ref.	Ref.	Ref.
Neither agree nor disagree	0.099	0.236	1	0.627	1.104
(Strongly) disagree	0.074	0.210	1	0.647	1.077
Gender					
Male	Ref.	Ref.	Ref.	Ref.	Ref.
Female	-0.061	0.297	1	0.586	0.941
Age	-0.010	4.347	1	0.037*	0.990
Education					
Secondary	Ref.	Ref.	Ref.	Ref.	Ref.
Tertiary	0.008	0.005	1	0.945	1.008

Note: Own calculation based on the EWCTS 2021; (*) Correlation is significant at the 0.1 level (two-tailed); *Correlation is significant at the 0.05 level (two-tailed); **Correlation is significant at the 0.01 level (two-tailed), N = 1806; Nagelkerke $R^2 = 0.140$

between presenteeism [$\chi^2(18) = 96.059$, $p < 0.001$]. The model correctly classified 72.9 % of the cases. Regression coefficients are presented in Table 4. Wald statistics indicated that support of managers, working high speed, and experience of emotional exhaustion significantly predict presenteeism for non-teleworkers.

Table 4: Logistic Regression – Model 3 (no telework)

	B	Wald	df	p	Odds Ratio
Support of Manager					
Never of rarely	Ref.	Ref.	Ref.	Ref.	Ref.
Sometimes	-0.341	1.431	1	0.232	0.711
Often or always	-0.638	6.378	1	0.012*	0.528
Support of Colleagues					
Never or rarely	Ref.	Ref.	Ref.	Ref.	Ref.
Sometimes	0.581	2.853	1	0.091(*)	1.787
Often or always	0.117	0.16	1	0.689	1.124
Usual working hours	0.021	6.029	1	0.014*	1.021
Working high speed					
Never or rarely	Ref.	Ref.	Ref.	Ref.	Ref.
Sometimes	0.494	3.936	1	0.047*	1.638
Often or always	0.513	4.851	1	0.028*	1.670
Working tight deadlines					
Never or rarely	Ref.	Ref.	Ref.	Ref.	Ref.
Sometimes	0.201	0.673	1	0.412	1.222
Often or always	0.306	1.926	1	0.165	1.358
Job control (Index)	-0.009	0.016	1	0.898	0.991
Experience of emotional exhaustion					
Never or rarely	Ref.	Ref.	Ref.	Ref.	Ref.
Sometimes	0.824	18.758	1	<0.001**	2.280
Often or always	1.042	24.907	1	<0.001**	2.835
Work engagement (Index)	-0.011	0.01	1	0.919	0.989
Experience of job insecurity					
(Strongly) agree	Ref.	Ref.	Ref.	Ref.	Ref.
Neither agree nor disagree	0.125	0.194	1	0.659	1.133
(Strongly) disagree	-0.042	0.035	1	0.853	0.959
Gender					
Male	Ref.	Ref.	Ref.	Ref.	Ref.
Female	0.038	0.054	1	0.817	1.039
Age	-0.007	1.027	1	0.311	0.993
Education					
Secondary	Ref.	Ref.	Ref.	Ref.	Ref.
Tertiary	0.077	0.222	1	0.638	1.080

Note: Own calculation based on the EWCTS 2021; (*) Correlation is significant at the 0.1 level (two-tailed); *Correlation is significant at the 0.05 level (two-tailed); **Correlation is significant at the 0.01 level (two-tailed); N = 929; Nagelkerke $R^2 = 0.143$

Table 5: Logistic Regression – Model 4 (occasional telework)

	B	Wald	df	p	Odds Ratio
Support of Manager					
Never of rarely	Ref.	Ref.	Ref.	Ref.	Ref.
Sometimes	0.318	0.287	1	0.592	1.374
Often or always	-0.362	0.406	1	0.524	0.697
Support of Colleagues					
Never or rarely	Ref.	Ref.	Ref.	Ref.	Ref.
Sometimes	0.795	1.101	1	0.294	2.214
Often or always	0.936	1.981	1	0.159	2.550
Usual working hours	0.012	0.433	1	0.510	1.012
Working high speed					
Never or rarely	Ref.	Ref.	Ref.	Ref.	Ref.
Sometimes	-0.289	0.349	1	0.555	0.749
Often or always	0.215	0.181	1	0.670	1.240
Working tight deadlines					
Never or rarely	Ref.	Ref.	Ref.	Ref.	Ref.
Sometimes	-0.701	1.901	1	0.168	0.496
Often or always	-0.135	0.077	1	0.781	0.874
Job control (Index)	0.017	0.011	1	0.915	1.018
Experience of emotional exhaustion					
Never or rarely	Ref.	Ref.	Ref.	Ref.	Ref.
Sometimes	1.421	14.224	1	<0.001**	4.143
Often or always	1.993	18.891	1	<0.001**	7.338
Work engagement (Index)	-0.095	0.158	1	0.691	0.91
Experience of job insecurity					
(Strongly) agree	Ref.	Ref.	Ref.	Ref.	Ref.
Neither agree nor disagree	-0.06	0.009	1	0.925	0.942
(Strongly) disagree	-0.523	0.883	1	0.347	0.593
Gender					
Male	Ref.	Ref.	Ref.	Ref.	Ref.
Female	-0.477	1.893	1	0.169	0.62
Age	0.008	0.261	1	0.610	1.008
Education					
Secondary	Ref.	Ref.	Ref.	Ref.	Ref.
Tertiary	-0.162	0.205	1	0.651	0.851

Note: Own calculation based on the EWCTS 2021; (*) Correlation is significant at the 0.1 level (two-tailed); *Correlation is significant at the 0.05 level (two-tailed); **Correlation is significant at the 0.01 level (two-tailed); N = 228; Nagelkerke $R^2 = 0.247$

A fourth logistic regression was conducted to determine which independent variables are predictors for presenteeism for those who occasionally telework. Data screening led to the elimination of several outliers. Regression results indicated that the overall model fit of the predictors was better compared to the zero model (-2 Log likelihood = 252.498, zero model = -2 Log

likelihood = 2255.888) and was statistically reliable in distinguishing between presenteeism [$\chi^2(18) = 45.369$, $p < 0.001$]. The model correctly classified 74.1% of the cases. Regression coefficients are presented in Table 5.

Table 6: Logistic Regression – Model 5 (often or always telework)

	B	Wald	df	p	Odds Ratio
Support of Manager					
Never of rarely	Ref.	Ref.	Ref.	Ref.	Ref.
Sometimes	-0.234	0.404	1	0.525	0.791
Often or always	-0.056	0.034	1	0.854	0.945
Support of Colleagues					
Never or rarely	Ref.	Ref.	Ref.	Ref.	Ref.
Sometimes	-0.145	0.104	1	0.747	0.865
Often or always	-1.109	7.578	1	0.006**	0.33
Usual working hours	-0.017	3.221	1	0.073(*)	0.983
Working high speed					
Never or rarely	Ref.	Ref.	Ref.	Ref.	Ref.
Sometimes	0.157	0.314	1	0.575	1.170
Often or always	0.675	6.645	1	0.010**	1.963
Working tight deadlines					
Never or rarely	Ref.	Ref.	Ref.	Ref.	Ref.
Sometimes	0.737	5.349	1	0.021*	2.090
Often or always	0.689	5.435	1	0.02*	1.991
Job control (Index)	-0.226	6.895	1	0.009**	0.798
Experience of emotional exhaustion					
Never or rarely	Ref.	Ref.	Ref.	Ref.	Ref.
Sometimes	0.465	4.707	1	0.03*	1.592
Often or always	0.717	9.268	1	0.002**	2.049
Work engagement (Index)	-0.206	2.429	1	0.119	0.814
Experience of job insecurity					
(Strongly) agree	Ref.	Ref.	Ref.	Ref.	Ref.
Neither agree nor disagree	0.03	0.007	1	0.932	1.030
(Strongly) disagree	0.259	0.911	1	0.340	1.296
Gender					
Male	Ref.	Ref.	Ref.	Ref.	Ref.
Female	-0.141	0.605	1	0.437	0.869
Age	-0.02	4.736	1	0.030*	0.981
Education					
Secondary	Ref.	Ref.	Ref.	Ref.	Ref.
Tertiary	-0.009	0.002	1	0.968	0.991

Note: Own calculation based on the EWCTS 2021; Dependent dichotomous variable: Presenteeism; (*) Correlation is significant at the 0.1 level (two-tailed); *Correlation is significant at the 0.05 level (two-tailed); **Correlation is significant at the 0.01 level (two-tailed); N = 649; Nagelkerke $R^2 = 0.162$

Wald statistics indicated that experience of emotional exhaustion significantly predict presenteeism for those who occasionally telework.

A final logistic regression was conducted to determine which independent variables are predictors for presenteeism for those who often or always telework. Data screening led to the elimination of several outliers. Regression results indicated that the overall model fit of the predictors was better compared to the zero model (-2 Log likelihood = 766.798, zero model = -2 Log likelihood = 2255.888) and was statistically reliable in distinguishing between presenteeism [$\chi^2(18) = 81.752$, $p < 0.001$]. The model correctly classified 69.2% of the cases. Regression coefficients are presented in Table 6. Wald statistics indicated that support of colleagues, working high speed, working tight deadlines, job control, experience of emotional exhaustion, and age significantly predict presenteeism for those who often or always telework.

Discussion

The EWCTS data from 2021 was utilized to analyse the elements that influence the prevalence of presenteeism, categorized based on the extent of telework utilization. To achieve this objective, logistic regression models were computed.

The degree of telework use has an influence on the occurrence of presenteeism. People who often or always home-based telework are 1.5 times more likely to show presenteeism. The fact that telework is associated with presenteeism is also consistent with the studies by Steidelmüller et al. (2020) and Schmitz et al. (2023).

A separate analysis of the different groups of telework users showed that the experience of emotional exhaustion increases the probability of presenteeism in all groups. This result is in line with previous studies (Ferreira et al., 2019; Lu, L. Cooper, et al., 2013; Miraglia & Johns, 2016). In all applicable models, people who often or alwayse experience emotional exhaustion show a higher chance for presenteeism than people, who never or rarely experience emotional exhaustion.

It also emerged that the experience of support from the manager has an influence on the occurrence of presenteeism in the overall model as well as for the non-teleworkers. This result confirms previous studies that were able to demonstrate an increased probability of presenteeism in the perceived lack of support from the manager (Caers et al., 2021; Janssens et al., 2015; Mori

et al., 2022; Schmitz et al., 2023). Support from the manager had no influence on the occurrence of presenteeism for other groups.

Analogue to previous studies (Goto et al., 2020; Miraglia & Johns, 2016) the experience of support from colleagues was only a significant factor for people who often or always telework. Experiencing support from colleagues in these groups had a mitigating effect on presenteeism.

Weekly working hours also showed to have an influencing effect on presenteeism. For non-teleworkers as well as employees who often or always telework, increasing weekly working hours were associated with an increase in the occurrence of presenteeism. This result is supported by the results of Lu & Cooper (2022).

Working high speed showed to have an influence overall as well as for non-teleworkers and employees who often or always telework. As well as be confronted with tight deadlines showed to be in relationship with presenteeism for the overall model as well as for people who often or always telework. These results are in line with the findings of Caverley et al. (2007) where presenteeism is described as a possible coping strategy when facing high workloads and deadlines.

Job control, as the ability to determine the speed of work or the order in which work tasks are completed, also proved to be a mitigating factor in the overall model and for those who telework often or always. The higher the degree of job control, the lower the probability of presenteeism occurring. This result is in line with those of Miraglia & Johns (2016).

Socio-demographic factors show a partial influence on the probability of occurrence. For example, age in M2 and M5 shows a reduction in the probability of presenteeism occurring with increasing age. This result is in line with the findings of Allemann et al. (2019).

No effects could be calculated for job engagement, the experience of job insecurity, gender, and education for any model.

Conclusion

The aim of this article was to investigate the relationship between telework and presenteeism and to determine which potentially influential factors affect this relationship in the context of the COVID-19 pandemic. This study focussed on the Visegrad countries due to the lack of research for this group of

countries. Data from the European Working Conditions Telephone Survey from 2021 was used to calculate the logistic regression models.

Key findings

The findings indicated that the occurrence of emotional exhaustion, was linked to presenteeism across all telework groups. Furthermore, the presence of managerial and colleague support, a high work tempo, strict deadlines, and job control – albeit not universally – were significant contributors to the prevalence of presenteeism. Within the realm of socio-demographic characteristics, certain groups exhibited minimal explanatory power when considering age.

Contribution

In terms of scientific contribution, this article provides insights into the topic of presenteeism and telework for the Visegrad Countries, for which there has been no previous research. This article specifically explores elements that impact the occurrence of presenteeism and investigates the factors that influence presenteeism in various telework user groups.

In terms of practical contribution the significance of telework will continue to grow in the forthcoming years. Consequently, it is crucial to examine how organisations might establish circumstances that facilitate employees' ability to maintain good health and high levels of productivity. When planning working circumstances, it is crucial to consider the function of managers and the impact of emotional stress on employees' productivity. Social relationships are particularly important for employees who often or always work from home in order to reduce the risk of presenteeism. Organisations and managers can create the conditions to promote social interaction between employees.

Limitations and further research

This analysis utilized the EWCTS data set from 2021, which was gathered within the ongoing pandemic. When analysing the findings, it is crucial to consistently consider them within the framework of these particular situations.

This study conducted a comparative analysis by aggregating a cluster of countries, specifically the Czech Republic, Slovakia, Hungary, and Poland, known as the Visegrad Group. It is important to consider this factor when adapting the results to specific regional variations. In order to uncover regional disparities, future studies should focus on analysing individual countries.

The proportion of explained variance in the calculated models was weak to moderate (14%-24.7%). Other variables that were not included in the models presented here can further enhance the explanatory power.

Disclosure

The author declares no conflict of interest. No funding was received to assist with the preparation of the manuscript. The data used in this study are available via UK Data Service (registration needed): https://ukdataservice.ac.uk.

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