

Comparing Exposure to Psychosocial Risks: Face-to-Face Work vs. Telework

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ABSTRACT

Background: In recent years, substantial changes have occurred in the work organization and arrangements. One of the main ones has been the popularization of teleworking among non-manual workers. This paper aims to assess the exposure of psychosocial risks among non-manual Spanish wage-earners, depending on the working modality (mainly telework, combining teleworking with onsite work, or onsite work). **Methods:** Based on an online survey conducted between April and May 2021, a cross-sectional study was carried out among $n=11,519$ members of a trade union where Psychosocial Risks (PSR) were measured through COPSOQ Questionnaire Scales. All analyses were performed stratifying by sex. **Results:** Women who combine telework and face-to-face work (aPR: 1.21; 95%CI 1.07-1.37) and men who mainly telework (aPR: 1.26; 95%CI 1.11-1.43) and that combine (aPR: 1.27; 95%CI 1.11-1.45) are more exposed to quantitative demands than men and women who do not telework. On the other hand, women who telework, either entirely (aPR: 0.89; 95%CI 0.82-0.97) or combining (aPR: 0.89; 95%CI 0.81-0.98), are less exposed to emotional demands than women who do not telework, and the same occurs among men who mainly telework (aPR: 0.84; 95%CI 0.76-0.92). Telework and horizontal or vertical social support are not associated, except for supervisor support among males, nor with work-life conflict. **Conclusions:** Except for quantitative demands, employees who combine telework and face-to-face work are less exposed to psychosocial risks than those who mainly telework or work face-to-face only. More studies with a gender and class perspective are needed in this area.

1. INTRODUCTION

The COVID-19 pandemic has profoundly impacted work and non-work roles, fundamentally altering the traditional work environment. With the necessity to adapt to remote work, many workers have

had to blur the boundaries between their professional and personal lives, transforming their homes into dual-purpose spaces serving residences and offices [1]. Consequently, a pressing need arises to redefine these boundaries and confront the ensuing challenges to achieve a harmonious work-life balance.

According to estimates by the Publications Office of the European Union [2], approximately half of Europeans worked remotely, at least partially, in response to the COVID-19 crisis, representing a significant increase from the pre-pandemic figure of 12%. By 2022, however, this proportion has receded to 30% (including hybrid modality).

Digitalization has undoubtedly facilitated greater autonomy and connectivity within the workplace. Still, it may also trigger the “need to work faster and to face tighter deadlines” [3, 4] and potentially increase the risk of presenteeism.

While the trend towards flexible work arrangements has been ongoing for several years, it has accelerated due to the pandemic. New flexible work designs [5] have been implemented. Work flexibility encompasses variations in location (flexplace), work schedule (flexitime) [6], and tasks. Research suggests that flexitime and flexplace are positively associated with job satisfaction [7, 8], which, in turn, is related to autonomous motivation. Conversely, these flexible arrangements may lead to presenteeism due to chronic illness [9] or infectious illness [10], as workers can fulfil their responsibilities without commuting and without concern for spreading infections to colleagues. Moreover, flexitime allows for later starts and earlier finishes, facilitating work even when individuals are partially unwell [11].

The sudden transition to remote work has presented challenges in attaining a work-life balance, mainly due to the diverse experiences resulting from variations in work modalities among household members. These challenges exist alongside more traditional structural factors such as gender and social class [12, 13]. Ultimately, work-life balance reflects the collective outcome of individuals’ effectiveness and satisfaction in their professional and personal roles [14].

Research findings regarding vulnerability and health impairment are inconclusive, as both positive and negative effects on workers’ health have been observed [15, 16]. This may stem from the risk of work encroaching on non-work time, as work can be conducted from any location without time constraints, thereby facilitating the intrusion of work into non-work hours [17] and hindering a proper split between work and personal time and

potentially, which can lead to poor psychological detachment [18]. The possibility of choosing working hours has a minimizing effect on the perception of the mental demands that the job entails [19]. This, combined with the fact that employees often feel “privileged” to have the opportunity to work from home, can lead them to work while ill to maintain this work modality [20]. Consequently, decreases in absenteeism cannot be solely interpreted as indicative of positive health status among teleworkers [21].

Given the existing gaps in the literature, it becomes necessary to obtain evidence of the impact of working from home on the workers’ well-being, to understand the current situation better, and to design suitable and efficient strategies to improve their lives and working conditions. Hence, this study aims to evaluate the exposure to psychosocial risks among non-manual wage-earning workers in Spain, explicitly emphasizing working modalities (mainly telework, combining teleworking with onsite work, or onsite work), considering potential sex inequalities [22].

2. METHODS

2.1 Design, Study Population, and Sample

Based on an online survey, a cross-sectional study was carried out among the *Comisiones Obreras* (CCOO) members, the largest trade union in Spain. For this study, we selected non-manual workers over 16 years old who reside in Spain and have been working in a salaried job for at least 1 hour during the week preceding the survey. The sample consists of $n=11,519$ workers. All study procedures were approved by the Ethics Committee of the Autonomous University of Barcelona (reference CEEAH/3445). Participants signed a written informed consent.

2.2 Data Collection

Data was obtained between April and May 2021 from an online self-administered questionnaire. The trade union emailed participants, whose participation was confidential and voluntary.

2.3 Variables

2.3.1 Dependent Variables – Psychosocial Risk Factors (PSR)

PSR was measured through scales of the COP-SOQ Questionnaire (Copenhagen Psychosocial Questionnaire) for Spain [23]. In this study, we used eleven scales grouped into four domains: quantitative demands, work pace, and emotional demands (Psychological Demands at Work); influence and possibilities for development (Work Organization and Job Contents); social support from colleagues and social support from supervisors (Interpersonal Relations and Leadership); job insecurity, labour market insecurity, insecurity over working conditions and work-life conflict (Work Individual Interface). See Table 1S (supplementary material) for more details on the scales.

2.3.2 Explanatory Variables

The primary explanatory variable was working modality (teleworking, combining teleworking with onsite work, onsite work), and the stratification variable was sex (men, women). Adjustment variables were age (16-34; 35-49; 50 years old or more), occupational group (based on the National Classification of Occupations-CNO11), contract (permanent, temporary, and without contract), and living arrangements (cohabitation with children 0-12 years old; cohabitation with elderly people 70-80 years old; cohabitation with people >80 years old; cohabitation with sick or disabled people).

2.4 Analysis

Firstly, a descriptive analysis was performed by sex. Secondly, multivariate analyses were performed using robust Poisson regression models to calculate prevalence ratios (PR), with their 95% confidence intervals (95%CI), to estimate the exposure to psychosocial risk factors according to the working modality, stratifying by sex and adjusting by the rest of the explanatory variables. All the analyses were performed using STATA version 15.

3. RESULTS

Almost half of women (47.8%) are between 35 and 49 years old (Table 1), representing a limited percentage of women under 34 (9.2%). The vast majority (78.9%) work with a permanent contract. The highest percentages are found for women who telework (90.2%), followed by those who combine work modalities (84.2%). The most prevalent occupations among women are “scientists, academics and similar professionals” (48.5%) and “accountants, administrative workers and other office employees” (36.3%). Moreover, around 30% of women live with children under 12 years old, with higher percentages among those who telework (33.2%). Around 4% of women live with people between 70 and 80. With people over 80, these percentages are slightly higher among women who telework (4.3%) in the first case and women who combine work modalities (5.6%) in the latter. Finally, 17% of women live with sick or disabled people, with slight differences according to the working modality.

Most men (52.4%) are more than 50 years old, with a minority (6.6%) under 34 years old (Table 2). Most (88.6%) work with a permanent contract, from whom 93.7% telework and 89.9% combine work modalities. The most prevalent occupations among men are “scientists, academics and similar professionals” (57.2%) and “technicians and professional support staff” (23.2%). As for women, around 30% of workers live with children under 12 years old, with higher percentages among men who telework (31.8%). Around 3% of the men live with people between 70 and 80 years old, and with people over 80, these percentages are slightly higher among men who do not telework. Finally, 13.9% of men live with sick or disabled people, with slight differences according to the working modality.

Tables 3 and 4 show the prevalence of exposure to each psychosocial risk and the adjusted prevalence ratios (aPR) by sex and working modality.

Women combining telework and face-to-face work (Table 3) are more exposed to quantitative demands than women who do not telework (aPR: 1.21; 95%CI 1.07-1.37). On the other hand, women who telework, either entirely (aPR: 0.89; 95%CI

Table 1. Sample description. Women.

	Women			
	Mainly telework n (%)	Combine n (%)	No telework n (%)	Total n (%)
Age				
16-34	92 (8.6)	57 (6.1)	424 (10)	573 (9.2)
35-49	571 (53.2)	440 (47)	1972 (46.6)	2983 (47.8)
≥50	411 (38.3)	440 (47)	1832 (43.3)	2683 (43)
Type of contract				
Permanent	978 (90.2)	790 (84.2)	3188 (74.9)	4956 (79)
Temporary	106 (9.8)	148 (15.8)	1065 (25)	1319 (21)
Without contract	0	0	1 (0.02)	1 (0.02)
Occupational group				
Directors and managers	4 (0.4)	4 (0.4)	25 (0.6)	33 (0.5)
Scientific and intellectual professionals	397 (36.6)	412 (43.9)	2237 (52.6)	3050 (48.5)
Technicians and mid-level professionals	204 (18.8)	156 (16.6)	560 (13.2)	920 (14.7)
Accountants, administrative workers and other office employees	479 (44.2)	366 (39)	1432 (33.7)	2277 (36.3)
Living with children under 12 years old				
Yes	319 (33.2)	246 (30)	1160 (31.3)	1725 (31.4)
No	642 (66.8)	573 (70)	2549 (68.7)	3764 (68.6)
Living with people 70-80 years old				
Yes	41 (4.3)	32 (3.9)	152 (4.1)	225 (4.1)
No	920 (95.7)	787 (96.1)	3557 (95.9)	5264 (95.9)
Living with people over 80 years old				
Yes	30 (3.1)	46 (5.6)	171 (4.6)	247 (4.5)
No	931 (96.9)	773 (94.4)	3538 (95.4)	5242 (95.5)
Living with sick or disabled people				
Yes	165 (17.2)	140 (17.2)	628 (17)	933 (17.1)
No	796 (82.8)	673 (82.8)	3061 (83)	4530 (82.9)

0.82-0.97) or combining (aPR: 0.89; 95%CI 0.81-0.98), are less exposed to emotional demands than those who do not telework. Moreover, women who mainly telework are more exposed to low influence over their work (aPR: 1.24; 95%CI 1.08-1.41) and to low development possibilities (aPR: 1.20; 95%CI 1.08-1.34) than women who do not telework. Finally, women who mainly telework (aPR: 1.4; 95%CI 1.25-1.56) are more exposed to job loss insecurity, while women who combine

telework and face-to-face work (aPR: 0.83; 95%CI 0.72-0.96) are less exposed than those who do not telework. Women who mainly telework (aPR: 1.22; 95%CI 1.13 to 1.33) are more exposed to labour-marked insecurity, and women who combine (aPR: 0.94; 95%CI 0.89-0.99) are less exposed to working conditions insecurity than those who do not telework.

Concerning men (Table 4), those who telework entirely (aPR: 1.26; 95%CI 1.11-1.43) or combined

Table 2. Sample description. Men.

	Men			
	Mainly telework n (%)	Combined n (%)	No telework n (%)	Total n (%)
Age				
16-34	79 (8.5)	41 (5)	218 (6.5)	338 (6.6)
35-49	410 (44.3)	306 (37.6)	1374 (40.9)	2091 (41)
≥50	437 (47.2)	466 (57.3)	1769 (52.6)	2672 (52.4)
Type of contract				
Permanent	871 (93.7)	736 (89.9)	2939 (87)	4546 (88.7)
Temporary	58 (6.2)	83 (10.1)	438 (13)	579 (11.3)
Without contract	1 (0.1)	0	0	1 (0.02)
Occupational group				
Directors and managers	7 (0.8)	8 (1)	36 (1.1)	51 (1)
Scientists, academics and similar professionals	553 (59.5)	491 (60)	1893 (56.1)	2937 (57.3)
Technicians; professional support staff	215 (23.1)	180 (22)	795 (23.5)	1190 (23.2)
Accountants, administrative workers & other employees	155 (16.7)	140 (17.1)	653 (19.3)	948 (18.5)
Living with children under 12 years old				
Yes	257 (31.8)	208 (28.9)	829 (28)	1294 (28.8)
No	552 (68.2)	512 (71.1)	2130 (72)	3194 (71.2)
Living with people 70-80 years old				
Yes	23 (2.8)	15 (2.1)	107 (3.6)	145 (3.2)
No	786 (97.2)	705 (97.9)	2852 (96.4)	4343 (96.8)
Living with people over 80 years old				
Yes	18 (2.2)	25 (3.5)	115 (3.9)	158 (3.5)
No	791 (97.8)	695 (96.5)	2844 (96.1)	4330 (96.5)
Living with sick or disabled people				
Yes	109 (13.5)	94 (13.1)	419 (14.2)	622 (13.9)
No	699 (86.5)	625 (86.9)	2532 (85.8)	3856 (86.1)

with face-to-face (aPR: 1.27; 95%CI 1.11-1.45) are more exposed to quantitative demands than men who do not telework.

On the other hand, men who mainly telework (aPR: 0.84; 95%CI 0.76-0.92) are less exposed to emotional demands than men who do not telework. Finally, men who mainly telework are more exposed to job loss insecurity (aPR: 1.21; 95%CI 1.07-1.37) and to labour marked insecurity

(aPR: 1.13; 95%CI 1.03-1.24) than those who do not telework, while men who combine are less exposed to job loss insecurity (aPR: 0.85; 95%CI 0.73-0.99).

Nevertheless, statistically significant differences are not found in the exposure to work pace, work-life conflict, and social support according to the working modality, neither among men nor women.

Table 3. Prevalence and prevalence ratio of the exposure to psychosocial risks according to the working modality. Women.

	Women		
	Exposure (%)	aPR (95%CI)*	p-value
High quantitative demands			
No telework	33.2%	ref	-
Mainly telework	36.8%	1.06 (0.94 to 1.20)	0.319
Combine	40.1%	1.21 (1.07 to 1.37)	0.002
High work pace			
No telework	51.1%	ref	-
Mainly telework	55.2%	1.05 (0.95 to 1.16)	0.347
Combine	46.3%	0.90 (0.80 to 1.01)	0.063
High emotional demands			
No telework	79.3%	ref	-
Mainly telework	69.1%	0.89 (0.82 to 0.97)	0,009
Combine	70.7%	0.89 (0.81 to 0.98)	0,013
High work-life conflict			
No telework	59.8%	ref	-
Mainly telework	61.1%	1.02 (0.93 to 1.12)	0.654
Combine	57.6%	0.98 (0.89 to 1.09)	0.738
Low influence			
No telework	23.3%	ref	-
Mainly telework	32.3%	1.24 (1.08 to 1.41)	0.002
Combine	22.2%	0.90 (0.77 to 1.07)	0.229
Low development possibilities			
No telework	35.3%	ref	-
Mainly telework	49.1%	1.20 (1.08 to 1.34)	0.001
Combine	34.4%	0.94 (0.82 to 1.07)	0.321
Low social support from colleagues			
No telework	42.4%	ref	-
Mainly telework	43.7%	1.01 (0.90 to 1.13)	0.886
Combine	41.9%	1.00 (0.89 to 1.12)	0.991
Low social support from supervisor			
No telework	53.1%	ref	-
Mainly telework	50.6%	0.92 (0.83 to 1.02)	0.098
Combine	48%	0.92 (0.82 to 1.02)	0.128
High job loss insecurity			
No telework	35%	ref	-
Mainly telework	45.8%	1.4 (1.25 to 1.56)	<0.001
Combine	27.3%	0.83 (0.72 to 0.96)	0.011

	Women		
	Exposure (%)	aPR (95%CI)*	p-value
High labour market insecurity			
No telework	64.4%	ref	-
Mainly telework	78.0%	1.22 (1.13 to 1.33)	<0.001
Combine	65.1%	1.05 (0.95 to 1.15)	0.364
High working conditions insecurity			
No telework	42%	ref	-
Mainly telework	48.8%	1.03 (0.98 to 1.08)	0.237
Combine	35.5%	0.94 (0.89 to 0.99)	0.032

*Adjusted by age, type of contract, occupational group, and living arrangements (cohabitation with children 0–12 years old; with elderly people 70–80 years old; with people >80 years old; with sick or disabled people).

Table 4. Prevalence and prevalence ratio of the exposure to psychosocial risks according to the working modality. Men.

	Men		
	Exposure (%)	aPR (95%CI)*	p-value
High quantitative demands			
No telework	32.1%	ref	-
Mainly telework	39.8%	1.26 (1.11 to 1.43)	<0.001
Combine	40.3%	1.27 (1.11 to 1.45)	<0.001
High work pace			
No telework	40.7%	ref	-
Mainly telework	41.2%	0.97 (0.86 to 1.10)	0.663
Combine	38.1%	0.93 (0.82 to 1.07)	0.313
High emotional demands			
No telework	76.4%	ref	-
Mainly telework	65.4%	0.84 (0.76 to 0.92)	<0.001
Combine	70.8%	0.91 (0.83 to 1.01)	0.064
High work-life conflict			
No telework	54.3%	ref	-
Mainly telework	54.4%	0.98 (0.88 to 1.09)	0.734
Combine	56.2%	1.04 (0.93 to 1.16)	0.522
Low influence			
No telework	22.4%	ref	-
Mainly telework	21.5%	1.00 (0.84 to 1.18)	0.988
Combine	19.3%	0.94 (0.78 to 1.13)	0.515
Low development possibilities			
No telework	37.9%	ref	-
Mainly telework	41.8%	1.11 (0.98 to 1.26)	0.1
Combine	36.2%	0.98 (0.86 to 1.12)	0.782

Table 4 continues

Table 4. Prevalence and prevalence ratio of the exposure to psychosocial risks according to the working modality. Men. (*continued*)

	Men		
	Exposure (%)	aPR (95%CI)*	p-value
Low social support from colleagues			
No telework	39.0%	ref	-
Mainly telework	36.5%	0.95 (0.83 to 1.08)	0.419
Combine	35.3%	0.90 (0.78 to 1.03)	0.128
Low social support from supervisor			
No telework	51.5%	ref	-
Mainly telework	46.7%	0.89 (0.80 to 1.00)	0.055
Combine	48%	0.94 (0.84 to 1.06)	0.308
High job loss insecurity			
No telework	35%	ref	-
Mainly telework	42.1%	1.21 (1.07 to 1.37)	0.002
Combine	30.1%	0.85 (0.73 to 0.99)	0.031
High labour market insecurity			
No telework	67.2%	ref	-
Mainly telework	75.4%	1.13 (1.03 to 1.24)	0.01
Combine	67.7%	1.03 (0.93 to 1.14)	0.593
High working conditions insecurity			
No telework	43%	ref	-
Mainly telework	42.3%	0.98 (0.93 to 1.04)	0.487
Combine	38.1%	0.96 (0.91 to 1.02)	0.225

*Adjusted by age, type of contract, occupational group, and living arrangements (cohabitation with children 0–12 years old; with elderly people 70–80 years old; with people >80 years old; with sick or disabled people).

4. DISCUSSION

This study has allowed us to assess the distribution of psychosocial risk exposures among non-manual Spanish wage-earners, according to the working modality and stratified by sex one year following the onset of the COVID-19 pandemic.

Examining the relationship between demands and work pace, we find that men who mainly telework and both men and women who combine telework and face-to-face work show higher quantitative demands than those who do not telework. Most studies around this topic, also considering other countries, find that the workload has increased for a substantially more significant proportion of women than men, mainly attributed to increased

domestic responsibilities [24]. Telework appears to increase workload, extended and irregular working hours, and perpetual availability requirements, all of which represent prominent risk factors, particularly relevant within the context of the COVID-19 pandemic [25, 26], a phenomenon that had already been observed before the pandemic [27, 28].

Regarding work-life conflict, it is notable that while the percentages are slightly higher for women compared to men, there are no differences based on the working modality. Conflicting results from other literature suggest that working from home may positively impact well-being by enhancing the ability to balance family life [29]. The reduction in work-family challenges stems from employees' perception of having control over their work location, timing, and

processes. Kossek et al. [30] found that employees with a greater perception of job control exhibited significantly lower turnover intentions, family-work conflict, and depression. Telework may necessitate the integration of childcare and household responsibilities due to the challenges in delineating boundaries between work and personal life [31]. Over the past two decades, telework has undergone significant changes owing to technological advancements and its expansion to numerous occupations, necessitating careful consideration when interpreting these findings. Children's presence often prompts a redistribution of household chores within couples, emphasizing gender disparities and exacerbating work-to-family issues [32]. Women, who typically have a higher involvement in childcare, face a greater need to strike a balance [33], as evidenced by studies reporting increased work-to-family conflict, stress, and anguish among women [34, 35]. Recent research has also indicated an increase in domestic work among mothers working from home, particularly in routine childcare, compared to mothers who do not telework [36]. However, a more equitable allocation of cleaning and routine childcare is observed when comparing fathers commuting to employer facilities with those working from home. In Spain, women have experienced a lesser impact from lockdown situations, likely due to their heavier care workload. This contributes to women's significantly lower incidence of permanent and full-time contracts, ultimately leading to partial or total withdrawal from the labor market [37]. Nevertheless, studies have demonstrated that implementing planned, agreed, and prepared remote working measures under the "new normal" conditions has reduced work-family conflict [38].

While the observed differences are not statistically significant for social support, there is a pattern in which those who telework have better support, especially men. Our findings show that both women and men report lower levels of social support from supervisors when not teleworking. Additionally, when it comes to social support from colleagues, men experience lower levels when not teleworking, whereas women report diminished support when primarily teleworking. Literature frequently highlights negative emotions such as social isolation and loneliness

among teleworkers, affirming the significant social aspect of emotions [39]. Moreover, research underscores that computer-mediated communication, as opposed to face-to-face interaction, can detrimentally impact the emotional well-being of workers [40].

In terms of limitations, it is a cross-sectional study, which doesn't allow for the assurance of either the directionality of the relationships or their causality. Specific associations between working modalities and psychosocial risks explored herein may hint at reversed relationships. For example, when considering influence, although the versatility to integrate diverse working modalities may likely lead to heightened influence, an alternative viewpoint suggests that individuals with greater influence possess a heightened ability to alternate between in-person work and teleworking. Analogous reasoning can be extended to assessments of possibilities for developmental or job insecurity. As a result, our investigation principally focuses on associations that conform to a cause-and-effect logical sequence: the modality of work (cause) and exposure to psychosocial risks (effect). It is also important to acknowledge that the participants in this study were affiliated with the CCOO trade union. While the sample size is substantial, and this trade union encompasses all sectors of economic activity, we must refrain from asserting the sample's representativeness for the entire Spanish working population.

On the other hand, the analysis of exposure to PSR, according to the work modality, was conducted by adjusting for occupational groups to obtain conclusions that, as much as possible, could be explained independently of the occupation. The categorization used for this variable was based on the Spanish national occupational classification (CNO-11) at the 1-digit level, which is broad and, in some cases, might "hide" unequal distributions in some occupations that could explain part of the results. For example, the finding of higher emotional demands in women who work at their employer's premises may be confounded by a higher frequency of non-manual women with occupations in the healthcare sector, where telework is not possible, and where there are usually higher emotional demands. However, beyond the already mentioned large sample size, it is worth noting that, to the best of our knowledge, our

study is the first to analyse the exposure to psychosocial risks according to the working modality for the non-manual Spanish population and also consider potential differences based on a fundamental axis of inequality in the labor market, such as sex.

5. CONCLUSIONS

This study examines the exposure to psychosocial risks based on working modality, notably incorporating the combination of telework and face-to-face work into its analysis to understand better the effect of the different types of telework widely spread since the COVID-19 pandemic. A key finding of this study reveals that employees, irrespective of sex, who combine telework and face-to-face work are generally less exposed to psychosocial risks than those who mainly telework or those who work onsite, except for quantitative demands. Specifically, telework is associated with a lower exposure to emotional needs, but, on the other hand, it is associated with higher work demands (especially when combined with onsite work). Furthermore, the exposure to psychosocial risks varies by sex across different working modalities. Women primarily engaged in telework exhibit elevated levels of job insecurity across all dimensions, alongside challenges related to work pace, influence, and development possibilities. Similarly, men primarily engaged in telework also show a higher prevalence of job insecurity.

These findings can be valuable from an occupational medicine standpoint, considering that these remote working arrangements present a challenge for preventive services and occupational physicians, who traditionally operate within physical workplaces. The results highlight the importance of assessing the exposure to psychosocial risk factors among teleworkers to mitigate them, especially those concerning quantitative demands, thereby preventing potential adverse health effects.

SUPPLEMENTARY MATERIAL: TABLE S1

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DECLARATION OF THE USE OF AI: We declare that we have not used AI for any of the stages of the article.

REFERENCES

1. Koetsier J. 58% of American knowledge workers are now working remotely. *Forbes*. Published online 2020.
2. Eurofound. *Fifth Round of the Living, Working and COVID-19 e-Survey: Living in a New Era of Uncertainty*. European Foundation for the Improvement of Living and Working Conditions: Dublin.; 2022.
3. Paškvan M, & KB. The intensification of work. In: *Job Demands in a Changing World of Work*. 1st ed.; 2017:25-44.
4. Ďuranová L, Ohly S. Persistent work-related technology use, recovery and well-being processes: Focus on supplemental work after hours. *Springer*. Published online 2016.
5. Ronald E. Rice. *Flexwork, Work-Family Boundaries, and Information and Communication Technologies*. (Guido Hertel DLSRDJJP, ed.); 2017.
6. Ruhle SA, Breitsohl H, Aboagye E, et al. “To work, or not to work, that is the question” – Recent trends and avenues for research on presenteeism. *EJWOP*. 2020;29(3): 344-363. Doi: 10.1080/1359432X.2019.1704734
7. Kelliher C, Anderson D. Doing more with less? Flexible working practices and the intensification of work. *Hum Relat*. 2010;63:83-106.

8. Gajendran RS, & Harrison DA. The good, the bad, and the unknown about telecommuting: Meta-analysis of psychological mediators and individual consequences. *J Appl Psychol.* 2007;92:1524-1541.
9. Holland P, Collins AM. "Whenever I can I push myself to go to work": a qualitative study of experiences of sickness presenteeism among workers with rheumatoid arthritis. *Disabil Rehabil.* 2018;40(4):404-413. Doi: 10.1080/09638288.2016.1258436
10. Rousculp MD, Johnston SS, Palmer LA, Chu B-C, Mahadevia PJ, Nichol KL. Attending work while sick: Implication of flexible sick leave policies. *J Occup Environ Med.* 2010;52:1009-1013.
11. Irvine A. Fit for work?: The influence of sick pay and job flexibility on sickness absence and implications for presenteeism. *Soc Policy Adm.* 2011;45:752-769.
12. Kreiner K, Hollensbe EC, Sheep ML. Balancing borders and bridges: negotiating the work-home interface via boundary work tactics. *AMJ.* 2009;52:704-730.
13. Moreno-Colom S. The gendered division of housework time: Analysis of time use by type and daily frequency of household tasks. *Time Soc.* 2017;26(1):3-27. Doi: 10.1177/0961463X15577269
14. Greenhaus JH, Allen TD. *Work-Family Balance: A Review and Extension of the Literature.* 2nd ed.; 2011.
15. Eurofound ILO. Working anytime, anywhere: The effects on the world of work. *Publications Office; International Labour Office.* Published online 2017.
16. Amlinger-Chatterjee M. Psychische Gesundheit in der Arbeitswelt: Forschung Projekt F 2353: Atypische Arbeitszeiten.
17. Korunka C, & KB. *Job Demands in a Changing World of Work.* 1st ed. Springer International Publishing.; 2017.
18. Kinnunen U, Feldt T, de Bloom J, Sianoja M, Korpela K, Geurtus S. Linking boundary crossing from work to non-work to work-related rumination across time: a variable- and person-oriented approach. *J Occup Health Psychol.* 2017;22:467-480.
19. Mache S, Servaty R, Harth V. Flexible work arrangements in open workspaces and relations to occupational stress, need for recovery and psychological detachment from work. *J Occup Med Toxicol.* 2020;15(5).
20. Mann S, Holdsworth L. The psychological impact of teleworking: Stress, emotions, and health. *New Technol Work Employ.* 2003;18:196-211.
21. Steward B. Health trade-offs in teleworking: An exploratory study of work and health in computer home-based working. *Indexer.* 2001;22:2461-2491.
22. Demerouti E, Daantje D, ten Brummelhuis LL, Bakker AB. New ways of working: Impact on working conditions, work-family balance, and well-being. In: Korunka C. HP, ed. *The Impact of ICT on Quality of Working Life, Dordrecht, The Netherlands.* Springer. 2014:123-141.
23. Moncada Lluís S, Llorens Serrano C, Salas Nicás S, Moriña Soler D, Navarro Giné A. La tercera versión de COPSOQ-ISTAS21. Un instrumento internacional actualizado para la prevención de riesgos psicosociales en el trabajo. *Rev Esp Salud Pública.* 2021;95:e1-16.
24. Farré L, Yawaz Y, González L, Graves J. How the COVID-19 Lockdown Affected Gender Inequality in Paid and Unpaid Work in Spain. *IZA Discussion Paper 13434.* Published online 2020.
25. EU OSHA. *Telework and Health Risks in the Context of the COVID-19 Pandemic: Evidence from the Field and Policy Implications.*; 2021.
26. Antunes ED, Bridi LRT, Santos M, Fischer FM. Part-time or full-time teleworking? A systematic review of the psychosocial risk factors of telework from home. *Front Psychol.* 2023;14. Doi: 10.3389/fpsyg.2023.1065593
27. Syvänen S LK. Remote and Technology-Based Dialogic Development during the COVID-19 Pandemic: Positive and Negative Experiences. *Challenges, and Learnings Challenges.* 2022;13:2.
28. Rodríguez-Modroño P, López-Igual P. Job Quality and Work-Life Balance of Teleworkers. *Int J Environ Res Public Health.* 2021;18(6). Doi: 10.3390/ijerph18063239
29. Tavares A.I. Telework and health effects review. *Int J Health.* 2017;3(30).
30. Kossek EE, Lautsch BA, Eaton SC. Telecommuting, control, and boundary management: Correlates of policy use and practice, job control, and work-family effectiveness. *J Vocat Behav.* 2006;68(2):347-367.
31. Hill EJ, Hawkins AJ, Miller BC. Work and family in the virtual office: Perceived Influences of Mobile Network. *Fam Relat.* 1996;45(3):293-301.
32. Duxbury L, Halinski M. When more is less: an examination of the relationship between hours in telework and role overload. *Work.* 2014;48:91-103.
33. Barros AM, and da SJRG. Percepções dos indivíduos sobre as consequências do teletrabalho na configuração home-office : estudo de caso na Shell Brasil. *Cad EbapeBr.* 2010;8:72-91.
34. Kaduk A, Genadek K, Kelly EL, Moen P. Involuntary vs. voluntary flexible work: insights for scholars and stakeholders. *CommunityWork Family.* 2019;22:412-442.
35. Giunchi M, Pena-Jimenez M, Petrilli S. Work-Family Boundaries in the Digital Age: A Study in France on Technological Intrusion, Work-Family Conflict, and Stress. *Med Lav.* 2023;114(4).
36. Chung H; Seo H; Birkett H; Forbes S. Working from home and the division of childcare and house-work among dual-earner parents during the pandemic in the UK. *Merits.* 2022;2:270-292.
37. Escudero-Castillo I, Mato-Díaz FcoJ, Rodríguez-Alvarez A. Furloughs, Teleworking and Other Work Situations during the COVID-19 Lockdown: Impact on Mental Well-Being. *Int J Environ Res Public Health.* 2021;18(6). Doi: 10.3390/ijerph18062898
38. Ghislieri C, Molino M, Dolce V. To Work or Not to Work Remotely? Work-To-Family Interface Before and During the COVID-19 Pandemic. *Med Lav.* 2023;114(4).

39. Parkinson B. Emotions Are Social. *Br J Psychol.* 1996;87(4):663-683.
40. Hobbs D, Armstrong J. An Experimental Study of Social and Psychological Aspects of Teleworking. *Facilities.* 1998;98:214-218.

Comparing Exposure to Psychosocial Risks: Face-to-Face Work vs. Telework

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Table S1. Supplementary material. Definitions and origins of the exposition to PSR.
Description of the 11 different exposure dimensions of psychosocial risks under the COPSOQ method.

QUANTITATIVE DEMANDS	
Definition	Origin
<i>Psychological demands derived from the amount of work. They are high when we have more work than we can do in the allocated time.</i>	They have to do mainly with lack of personnel, incorrect time measurement or poor planning, although they can also be related to the salary structure (for example, when the variable part of a low salary is high and forces to increase the pace) or with the inadequacy of tools, materials or work processes (forcing to do more tasks to make up for deficiencies). High quantitative demands can lead to a lengthening of the working day.
WORK PACE	
Definition	Origin
<i>Psychological demand related to work intensity.</i>	Given the close relationship with quantitative exigence, the origin can be the same.
EMOTIONAL DEMANDS	
Definition	Origin
<i>These are the demands not to get involved in the emotional situation (or to manage the transfer of feelings) that derive from the interpersonal relationships involved in the work, especially in occupations of care for people in which the aim is to induce changes in them (for example: to follow a medical treatment, to acquire a skill...), and which may involve the transfer of feelings and emotions.</i>	In care occupations, exposure to emotional demands has to do with the nature of the tasks and cannot be eliminated (we cannot “eliminate” patients, students, etc.), so they require specific skills and sufficient time to be able to manage them effectively. In addition to the origin derived from their nature, they also have a lot to do with quantitative demands, the exposure time (hours, number of patients, etc.) can be reduced, since excessive workdays imply a greater exposure and produce a greater emotional fatigue that will require longer rest times.
WORK-LIFE CONFLICT	
Definition	Origin
<i>These are the synchronous, simultaneous demands of the work environment and the domestic-family environment.</i>	In the labor sphere, it has to do with quantitative requirements, the organization, duration, lengthening or modification of the working day and with the level of autonomy over it; for example, with working hours or days that are incompatible with care work or social life.

INFLUENCE

Definition

It is the margin of autonomy in the day-to-day work in general, and also particularly in relation to the tasks to be performed (the what) and in the way it is carried out (the how).

Origin

It has to do with the participation that each worker has in decisions on fundamental aspects of his or her daily work, that is, with the work methods used and whether or not these are participatory and whether or not they allow or limit autonomy. It can be highly correlated with development possibilities.

POSSIBILITIES OF DEVELOPMENT

Definition

It is the level of opportunities offered by the work performance to put into practice the knowledge, skills and experience of the workers and to acquire new ones.

Origin

It is highly related to the levels of complexity and variety of tasks, with standardized and repetitive work being the paradigm of harmful exposure. It is related to work and production methods and the design of work content (more routine, standardized or monotonous at one extreme, more complex and creative at the other) and to influence.

SOCIAL SUPPORT FROM COLLEAGUES

Definition

It is receiving the help needed and when it is needed from colleagues to perform the job well.

Origin

Lack of peer support may have to do with personnel management practices that hinder cooperation and the formation of true work teams, encouraging individual competitiveness (for example, with variable salaries based on individual objectives), or assigning tasks, changes in schedules, center, etc., in an arbitrary or non-transparent manner.

SOCIAL SUPPORT FROM SUPERVISOR

Definition

It is receiving the help needed and when needed from superiors to perform the job well.

Origin

The lack of support from superiors has to do with the lack of principles and specific personnel management procedures that promote the role of the superior as an element of support for the work of the team, department, section or area he/she manages. It is also related to the lack of clear guidelines regarding the fulfillment of this role and the lack of training and time to do so.

JOB LOSS INSECURITY

Definition

It is the concern to lose the job given the internal and external factors surrounding the worker situation.

Origin

It has to do mainly with the organization situation and the worker performance.
It can be experienced differently depending on the time of life or family responsibilities of each worker.

LABOR MARKET INSECURITY

Definition

It is the concern for the future in relation to the occupation.

Origin

It has to do with job stability and employability in the labor market of residence.
It can be experienced differently depending on the time of life or family responsibilities of each worker.

WORK CONDITIONS INSECURITY

Definition

It is the concern for the future in relation to unwanted changes in fundamental working conditions.

Origin

It relates to threats of worsening of particularly valuable working conditions. These can originate both in the current situation (for example, if the assignment of working hours, tasks and bonuses or salary supplements is arbitrary) and in the possibility of changes (for example, the announcement of a corporate restructuring, outsourcing of a position or service, a lay-off, etc.); more so if there are worse working conditions in the context outside the company (same sector, territory...). Like the previous one, it can be experienced differently depending on the vital moment or the family responsibilities of each worker.
