Identification of Key Psychosocial Safety Factors when Working Remotely: A Three-Step Research Methodology Proposal

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Abstract:

Purpose: *This article attempts to identify the factors influencing remote work and to investigate which of these factors are the most important from the perspective of employees' psychosocial safety. All research was set in the context of a crisis caused by the COVID-19 pandemic. The main aim of the study is to present the research methodology that considers the proprietary three-stage research procedure.*

Design/Methodology/Approach: *The research presented in the article was conducted at a university in Poland. Research methods characteristic of the social sciences were used, including analytical methods and a diagnostic survey. As a research tool, questionnaire forms consisting of questions about the impact of remote work on the psychosocial safety of respondents were used. In addition, the research used the MICMAC program, with the help of which the relationships between selected factors were analyzed.*

Findings: *The most important factors from the perspective of psychosocial safety of employees participating in the study are workload, organization of time between work and household chores, work outside of designated hours, time pressure, professional communication with colleagues, stress, technical supplies, and a sense of independence. The obtained results are only an example and illustrate the adopted research procedure. The research methodology presented in three steps is the achievement of the study.*

Practical Implications: *The presented research results indicate on which aspects of the organization of professional tasks the analyzed organization should focus on to provide its employees with the highest possible level of psychosocial safety in remote work conditions. Purposeful and targeted activities in this area allow the organization to reduce the negative consequences of psychosocial occupational hazards (such as e.g., employee absenteeism), and the available research results show a positive impact of such activities on work efficiency and on shaping a positive and resilient organizational culture.*

Originality/Value: *This research changes the commonly functioning approach to the perception of threats while working remotely only in terms of ergonomic, economic, and legal conditions. In the opinion of the authors, the methodology of identifying the key factors of psychosocial safety during remote work is universal and can be used in any organization and in any conditions, although it is especially dedicated to crisis situations that generate additional tension.*

Keywords: *Remote work, crisis, psychosocial safety, COVID-19, MICMAC.*

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1. Introduction

Work has always been an important part of human life. It can take various forms, one of which is remote work. The concept, first defined in the 1970s, is constantly evolving. In 1973, an American scientist - Jack Nilles - introduced and described the concept of teleworking. His research was related to the oil crisis in the United States at that time and consisted in restricting the movement of workers to workplaces (Avery and Zabel, 2001).

The authors of scientific studies in research on human work refer to various definitions of telework / remote work (these terms are often used synonymously, although there are many critical voices regarding this phenomenon). There are also studies presenting both the advantages and disadvantages of this form of work and its various varieties (Robertson *et al.,* 2003; Bąk, 2006; Rosenfield and Alves, 2011, Thulin *et al.,* 2019; Taveras *et al.,* 2020; Carnevale and Hatak, 2020; Khan *et al.,* 2020).

The legal aspects also leave a lot of room for interpretation. For example, Polish law does not precisely indicate the rules related to remote work. On the other hand, there is a legal definition of telework stating that "work may be performed regularly outside the workplace, using electronic means of communication within the meaning of the provisions on the provision of electronic services (telework)" (Labor Code, Article 675 §1).

Work performed outside the traditionally understood workplace (in an enterprise), although it has been the object of interest of researchers for about 50 years, is still subject to various analyzes. Their results provide new data on the impact of individual factors on remote work. The quality and effectiveness of this form of work may depend on many elements. And although the literature on the subject includes research results concerning primarily the legal, economic, and ergonomic conditions of remote work, the psychological and psychosocial aspect is more and more often mentioned by researchers.

The ongoing COVID-19 pandemic is not without significance for the development of research on these aspects, which has exposed so far invisible barriers and difficulties in the processes of organizing work, as well as individual consequences of a social and mental nature (Ewertowski and Butlewski, 2021).

2. Specifics of Remote Work

Already in the nineties of the twentieth century, Baruch and Nicholson (1997) outlined four main categories of factors that should be given special attention to make working from home as effective as possible. According to the authors, achieving optimal satisfaction and effectiveness of teleworking is possible only when all four aspects mentioned by them are met. These are: individual factors, work factors, home factors, and organizational factors. This theory was developed in 2020 by Belzunegui-Eraso and Erro-Garcés (2020), pointing to the need to consider the environmental, safety and legal aspects (Figure 1).

Figure 1. *Aspects influencing teleworking*

Source: *Own work based on Belzunegui-Eraso and Erro-Garcés.*

One of the factors often cited by researchers is the psychological aspect of limitations in contacts with colleagues. Specialists indicate two possibilities regarding the impact of teleworking on social bonds. The first one says that home-based work limits the ability to create and develop interpersonal relationships due to the fact that people are isolated from other people and public places (Harpaz, 2002). The second theory indicates that remote work can lead to changes in well-known social norms and to the individualisation of society. Relationships with colleagues would be replaced with the possibility of establishing stronger ties with family or members of the local community (Allen, Golden, and Shockley, 2015).

The growing interest in teleworking and related politics meant that it was promoted as a form of combining professional and family challenges. Researchers such as Greenhaus and Beutell (1985) indicated that teleworking can be a solution to the so-called "Work-family conflict" consisting in the occurrence of a contradiction between mutually incompatible roles in the professional and family area. Currently, the term is used in a more general way, using the acronyms WIF meaning that work may conflict with the family or FIW indicating that the family may conflict with work (Allen, Golden, and Shockley, 2015).

A person working from home can face many problems with managing work and family, so it is especially important to be well organized and to set clear boundaries and expectations for family and friends. Ashforth, Kreiner, and Fugate (2000) distinguished five types of boundaries that must be properly managed to separate professional and family roles. These are the boundaries physical, temporal, emotional, cognitive, and relational. Proper management of these elements can contribute to reducing the work-family conflict

One of the factors contributing to a significant increase in the interest in teleworking is also the desire to have greater independence. Some employees are particularly interested in high autonomy, characterized by increased freedom, independence, and discretion in

making decisions, as well as choosing the method of performing given tasks (Hackman and Oldham, 1976). Research by Gajendran, Harrison, and Delane-Klinger (2014) shows that remote work improves the perception of autonomy, and a stronger perception of autonomy leads to positive work-related outcomes. In addition, previous studies of the above authors indicate a relationship between autonomy and satisfaction with remote work (Gajendran and Harrison, 2007).

Employee satisfaction with remote work is often a very subjective issue. The feeling of satisfaction may depend on such factors as, for example, the quality of relationships with colleagues and management, communication, technological support from the company, training in remote work, as well as trust on the part of management (Fay and Kline, 2011; Baker, Avery, and Crawford, 2007). Job satisfaction may translate into greater commitment, and thus - positively affect the results.

Another factor that may affect remote work and its safety is stress. As in the case of job satisfaction, its perception is an individual matter and, in any case, may depend on the occurrence and mutual relations between internal and external factors (Sadłowska-Wrzesińska and Mościcka-Teske, 2016). Some researchers indicate that remote work is associated with less stress and fatigue. This may result from greater autonomy in the organization of one's own work, including the management of time and tasks (Gajendran and Harrison, 2007; Sardeshmukh, Sharma, and Golden, 2012).

The appearance of the SARS-CoV-2 virus in China in 2019 marked the beginning of huge changes in the labor market. When on March 11, 2020. The World Health Organization (WHO) has identified COVID-19 as a pandemic, entrepreneurs around the world had to face the upcoming challenge. Protecting employees from coronavirus infection has become an overriding issue in the processes of work organization and management. This situation caused certain difficulties and barriers that always accompanied remote work, but they did not occur on such a large scale and did not determine the success of other work processes.

3. Research Methodology

The research process was based on a three-step approach:

- analysis of the literature on the subject and identification of 20 factors influencing remote work;
- conducting a survey among the group of employees selected for the study, as a result of which the number of factors influencing remote work was limited (taking into account the organizational, situational and individual context);
- carrying out the MICMAC analysis, which takes into account the direct and indirect relationships between the factors and enables the selection of the most important of them due to the selected features (an attempt to objectify the obtained test results).

The interest in teleworking, which has been noticeable in recent years, brings many benefits in the form of interesting analyzes and recommendations in relation to the improvement of remote work. The analysis of the available data made it possible to

specify the factors that researchers most often indicate as important when working remotely.

The survey was conducted among scientific and administrative employees employed at the Faculty of Management Engineering at the Poznań University of Technology and concerned the impact of remote work on the psychosocial sense of employee psychosocial safety. They were conducted on a group of 50 respondents, including 32 women and 18 men. Most of the respondents were aged 30-49. The respondents identified their affiliation to institutes - the Institute of Safety and Quality Engineering, the Institute of Logistics, the Institute of Management, and Information Systems.

In the third step, the MICMAC (Matrix-based Multiplication Applied to a Classification) method was used in the research process, which was developed in 1973 by Michel Godet (Chandramowli, Transue, and Felder, 2011). It is used to study structural factors by using the analysis of the relations between them and their importance in the system. The MICMAC analysis explains how a given variable will function and how it should be managed. This technique uses matrices that contain all possible factor pairs with some or no dependence (ie, Factor A → Factor B). There are many examples in the literature that demonstrate the use of MICMAC analysis. This method was used by, among others:

- Lamming and Hampson, who analyzed and described problems related to both purchasing and supply chains in the largest British companies. These aspects were considered in the context of environmental management (1996);
- Gorane and Kant, who developed a case study to identify the driving force and dependency of the factors that enable supply chain management (2013);
- Bag and Anand, who developed a "green supply chain management model" for the rubber products manufacturing sector (2014);
- Khan et al., Who analyzed traceability systems in supply chain management for critical success factors (2018);
- Walters, Kaminsky and Gottschamer, who conducted a structural analysis of factors influencing solar energy use in households in Santiago, Chile (2018);
- Troche-Escobar, Lepikson and Freires, who presented different approaches to risk modeling in the supply chain of Brazilian wind energy projects (2018);
- Pramesti and Putra, who analyzed the factors influencing the functioning of cooperatives in the Badung regency in Bali (2020);
- Fathi *et al.,* Who developed four potential scenarios for the Iranian textile industry (2021).

4. Identification of Factors Influencing Remote Work – Results and Discussion

4.1 The Results of the Literature Analysis

The effectiveness and safety of remote work depends on many factors. First, three bundles of elements should be mentioned here; these are: psychosocial aspects, technical facilities and compliance with the principles of ergonomics. Based on the literature

review, the factors influencing teleworking were selected (Table 1) - these are the factors most frequently mentioned and characterized by the authors in thematic publications.

Table 1. *Factors influencing remote work*

Nr	Factor	Author								
		Tavares et al.	Raisiene et al.	Thulin, Vilhelmson i Johansson	Sroka	Allen, Golden & Shockley	Dolot	Mierzejewska & Chomicki	Robertson, Maynard & McDevitt	Carnevale, Hatak
1	Direct contact with other employees	X	X	X	X	X	X	X	X	X
2	Professional communication with colleagues	X	X			X	X	X		X
3	Organization of time between work and household chores	X	X	X	X	X	X	X	X	X
4	Working outside of designated hours		X		X		X		X	
5	Overwork / work load	X	X	X		X	X		X	X
6	Stress				X	X	X	X	X	
7	Time pressure	X		X					X	
8	Self-discipline	X	X			X				X
9	Concentration while working	X				X	X			
10	Motivation	X	X				X	X		
11	A sense of independence	X	X	X	X	X				X
12	Job satisfaction			X	X	X	X	X	X	X
13	Career development					X	X	X	X	X
14	Adapting to new routines	X	X			X				X
15	Direct access to documentation	X	X		X		X	X		
16	Adapting to new technologies	X	X	X	X		X			
17	Technical supplies	X				X	X	X	X	X

18	Having the right place to work at home	X					X	X	X	
19	Ergonomic conditions	X					X		X	
20	Commuting to work (cost)		X	X	X	X	X	X		

Source: Own work.

4.2 Results of Survey

The survey consisted of 20 questions which the respondents had to answer by selecting one of five possible variants. The questions were developed on the basis of factors selected from the literature review. Among them, the following were distinguished: professional communication with colleagues, organization of working time, stress, time pressure, motivation, job satisfaction and adaptation to new technologies.
The distribution of results is presented in Table 2.

Table 2. *Survey results*

Nr	Question	Answer				
		Absolutely yes	Rather yes	No opinion	Rather no	Absolutely no
1.	Does the lack of direct contact with other employees while working remotely make it difficult for you to work?	12%	30%	4%	34%	20%
2.	Does the method of communication with co-workers affect the effectiveness of your work?	24%	40%	4%	24%	8%
3.	Does remote work affect your organization of time between work and home duties?	46%	32%	4%	14%	4%
4.	Does it happen that you work outside the prescribed hours?	72%	24%	4%	0%	0%
5.	Do you experience an excessive workload while working remotely?	36%	34%	12%	18%	0%
6.	Does the remote work you perform contribute to the feeling of stress?	12%	40%	14%	26%	8%
7.	Do you feel time pressure while working remotely?	26%	30%	8%	32%	4%
8.	Can you maintain self-discipline in performing your duties while working remotely?	40%	48%	6%	6%	0%
9.	Can you maintain concentration on the work performed while working remotely?	38%	54%	2%	6%	0%
10.	Does remote work affect your motivation to work?	18%	40%	24%	12%	6%
11.	Do you feel a sense of independence when working remotely?	18%	26%	28%	22%	6%
12.	Does your remote work contribute to changing the level of job satisfaction?	28%	30%	16%	24%	2%
13.	Do you feel that remote work gives you the opportunity for career development and promotion?	8%	14%	22%	40%	16%
14.	Did you have a problem with adjusting to new, routine activities related to remote work?	8%	22%	8%	50%	12%

15.	Has the lack of direct access to documentation affected the efficiency of your work?	6%	12%	18%	44%	20%
16.	Did you have a problem with adapting to new technologies?	4%	10%	2%	50%	34%
17.	Did you have technical problems while working remotely (lack of adequate supplies, poor network connection, hardware damage)?	16%	36%	2%	40%	6%
18.	Do you have a suitable place at home for remote work?	50%	30%	4%	12%	4%
19.	Do you have adequate ergonomic conditions while working remotely?	22%	46%	4%	16%	12%
20.	Has remote work affected your travel costs?	40%	28%	12%	16%	4%

Source: Own work.

The results of the survey showed that the respondents considered the most significant factors of remote work: professional communication with co-workers, organization of time between work and home duties, work outside the designated hours, overwork, stress, time pressure, motivation, sense of independence, job satisfaction, technical supplies and costs of commuting. On this basis, further research was conducted.

4.3 MICMAC Results

To conduct the study with the use of the MICMAC program, factors selected on the basis of a literature review and the results of surveys conducted among employees of the Faculty of Management Engineering at the Poznań University of Technology were used. The method analyzes the relationships between 11 factors.

Table 3 shows the direct relationships between the elements. Structural analysis was used for this. The occurring dependencies are described using numerical values, where:

- 0 means no dependency,
- 1 means there is a small dependency,
- 2 means the presence of an average dependence,
- 3 means there is a large dependency.
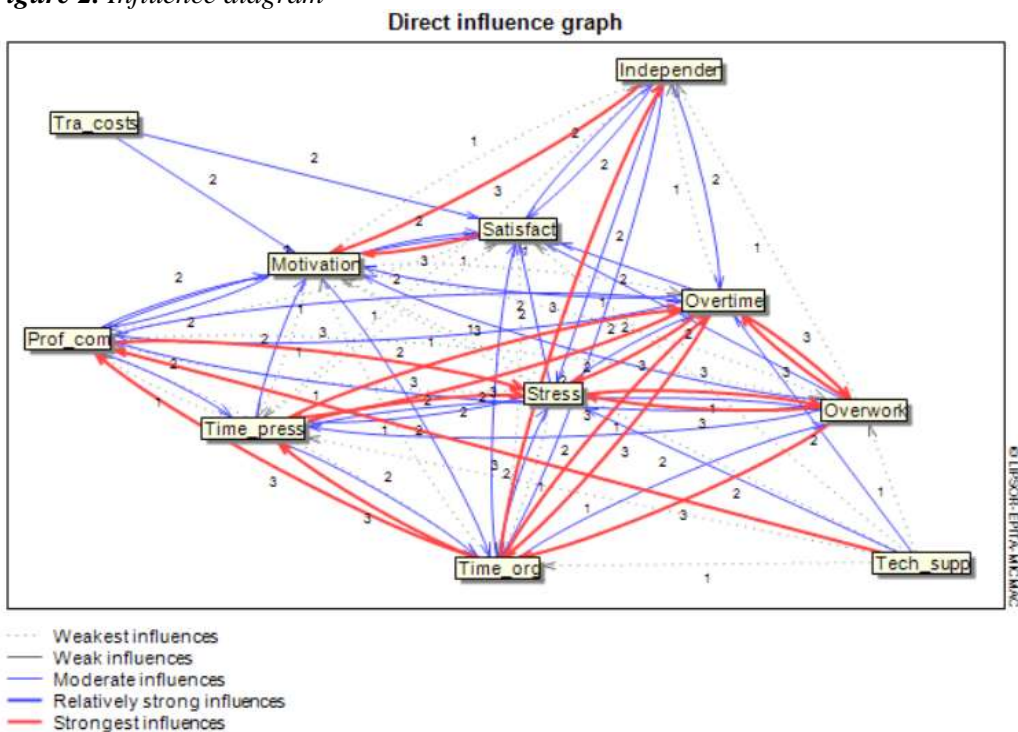
Table 3. *Relationship between factors matrix*

Lp.	Factor	1	2	3	4	5	6	7	8	9	10	11
1	Professional communication with colleagues	0	1	2	1	3	2	2	0	2	0	0
2	Organization of time between work and household chores	3	0	3	2	2	3	1	3	2	0	0
3	Working outside of designated hours	2	3	0	3	3	3	2	1	2	0	0
4	Overwork / work load	2	3	3	0	3	2	2	1	2	0	0
5	Stress	1	1	2	3	0	2	1	0	2	0	0
6	Time pressure	1	2	3	2	3	0	2	0	1	0	0
7	Motivation	2	2	1	1	0	1	0	1	2	0	0
8	A sense of independence	0	2	2	0	2	1	3	0	2	0	0

9	Job satisfaction	1	1	0	0	0	0	3	2	0	0	0
10	Technical supplies	3	1	2	1	2	1	1	0	1	0	0
11	Commuting to work (costs)	0	0	0	0	0	0	2	0	2	0	0

Source: Own work.

The results obtained with the MICMAC software are presented on a graph (Figure 2). It presents the relationships between the variables, considering their intensity. The red lines show the strongest relationships between the examined factors, relatively strong and moderate ones are marked in blue. Weak relationships between the variables are shown in gray, and the weakest – with a dashed line.
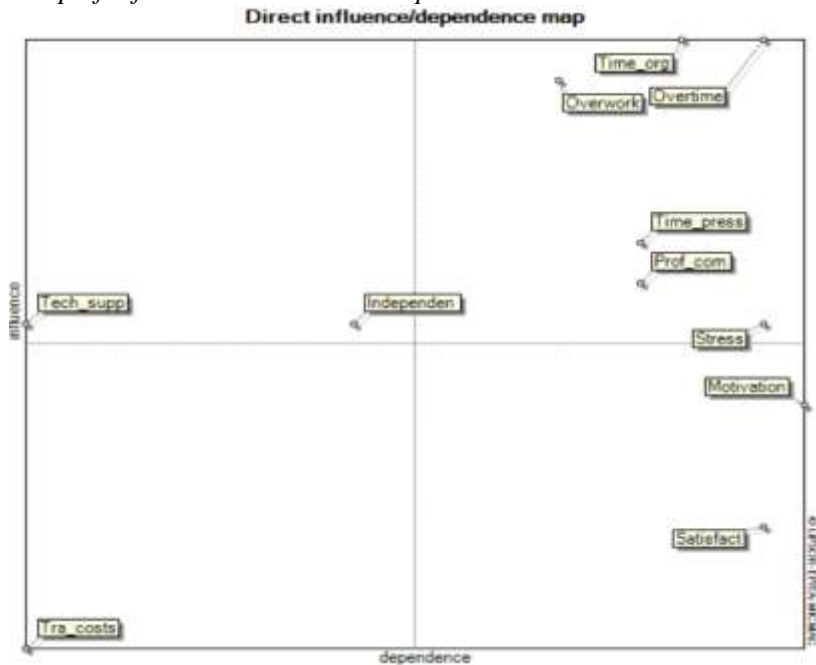
Figure 2. *Influence diagram*

Source: Own work.

In the next stage, a direct classification was carried out and indirect, based on the forces of dependence and the forces of influence. The program takes into account paths and feedback loops. On this basis, a map was created (Figure 3), which graphically presents the distribution of the examined factors, taking into account the corresponding forces of influences and relationships. The map consists of 4 parts with specific features. They reflect individual categories of variables: autonomous, related, dependent and independent.

Figure 3. *Map of influences and relationships.*

Source: Own work.

The group of independent factors includes technical supply and a sense of independence, which are characterized by a high driving force and a weak force of dependence. The workload, the organization of time between work and household chores, work outside of designated hours, time pressures, professional communication with colleagues and stress.

The group of dependent factors includes job satisfaction and motivation, they have a weak driving force and a high power of dependence. Actions related to such variables should take place after performing actions on the factors on which they depend. The autonomous variables are allocated to costs related to commuting, which means that this factor has a weak dependency force and driving power, and thus is relatively isolated from the system and can be considered separately from the rest.

Particular attention should be paid to elements from the group of independent and related factors. The category of independent factors is particularly important due to the fact that, taking into account the characteristics of variables, they should be considered first. On the other hand, related factors are important due to the fact that they are influenced by their own actions, i.e., there is feedback (Chandramowli, Transue, and Felder, 2011).

5. Conclusion

The increase in the importance of telework caused, among others, by technological progress and the economic aspect contributed to the fact that more and more enterprises began to be interested in teleworking and the opportunities it offers. Increasing flexibility,

both for employees and organizations, has resulted in new problems related to the impact of this form of work on the health and safety of employees and occupational health and safety management. New threats may affect both the physical and mental safety of a person, therefore it is particularly important to recognize and minimize them.

The unprecedented situation of the pandemic caused a significant increase in the number of people who either started working remotely to a greater extent than before or encountered this form of fulfilling their professional duties for the first time. The consequence of this new situation may be a change in the assessment of remote work, the approach to it and the attitude to emerging difficulties.

To sum up, remote work is an increasingly common form of work, which prompts a more detailed analysis of this method of employment. It is also worth considering its impact on the psychosocial safety of the employee. In this study, an attempt was made to identify the variables affecting remote work and the most important of them. The research results show on which elements of remote work an organization should focus its efforts to provide its employees with the highest possible level of comfort, taking into account various aspects of psychosocial safety.

The considerations and results of the research presented in this study do not exhaust the entirety of the issues related to the security of remote work, but they indicate the direction and possibilities for improving research in this area and may also prove helpful in the operational activities of enterprises.

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