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THE INTERACTION OF PHYSICAL AND MENTAL RISK FACTORS ON OFFICE WORKERS IN THE BANKING SECTOR IN LATVIA

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Abstract. Over the last years, physical and especially psychosocial risks have emerged as one of the main ones for intellectual work performers, including workers in the banking sector. This is due to the context of new technologies, digitalization and automatization of work processes. The interaction of physical and mental stress in the working environment and the risk factors have a significant impact on the employee's wellbeing and performance. Aim of the research was to investigate the interaction of physical and mental strain on office workers in the banking sector in Latvia based on questionnaire and NASA-TLX method application results. Questionnaire results proved that main physical risks at work are prolonged sitting and discomfort in various body parts, but mental strain involves excessive work-related tasks, high-speed work, physical exhaustion. Using NASA-TLX method it was proved that banking sector employees experienced a moderate level of mental workload. Female employees reported higher scores across all NASA-TLX dimensions, suggesting greater cognitive and emotional strain. Interaction between physical and mental risk factors at the banking sector work environment can cause significant health and work efficiency issues.

Keywords: banking employees, physical, mental, risk factors, interaction.

JEL Classification: M54, I31.

1. Introduction

The banking sector is conceptualized as a central hub and diagnostic instrument of the financial system in Latvia, employing more than 5,000 individuals (Latvijas Banka, 2023). Office workers in the banking sector face a combination of physical and mental risk factors that significantly impact their health and productivity. These factors include high mental stress, physical strain, and ergonomic issues, which together contribute to various health problems. Today, psychosocial risks (PSR) that involve workload, job control, work relationships, organisational culture, work-life balance and arise from a combination of organizational factors, the design of work tasks, management and leadership styles, and the overall work environment are an integral part of everyday life in various professions, proved in many studies (Bliese et al., 2017; Di Tecco et al., 2023; Leka et al., 2017). Over the last years, physical and especially psychosocial risks have emerged as one of the main ones for intellectual work performers. Health problems caused by psychosocial risks at work are a serious risk factor for the psychological and social well-being of bank employees (Giorgi et al., 2017). Employees in the financial sector are usually exposed to work with limited deadlines at high speeds in forced working postures (Makhbul et al., 2011). The most common diseases reported by bank employees in surveys are cardiovascular diseases and work related muscular skeletal disorder`s (WRMSDs), as well as stress-related health problems (Clays et al., 2016; Nepal & Koirala, 2024; Silva & Barreto, 2012). Studies on different occupational groups have found that physical load and psychosocial risks interact significantly to affect WRMSDs, as well as to be associated with frequent absenteeism of employees (Pastare et al., 2020; Widanarko et al., 2014; Widanarko et al., 2015). Studies on the interaction of various physical and psychosocial stressors have concluded that the consequences of this interaction are different for women and men, namely that women are more likely to be stressed (Johnston et al., 2010). Several

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scientists consider that mental stress is multidimensional and includes the complexity of the task to be performed, the individual characteristics of the operator and the impact of the environment on the worker (Carayon et al., 1999; Young et al., 2015). The European Working Conditions Telephone Survey 2021 showed that employees in the financial sector work more hours than specified in their contracts and are more willing to telework. According to the survey, 27% of financial workers reported this. Nevertheless, the quality of work in the financial sector is high, as shown by data on the provision of resources in the financial sector (Eurofound, 2021).

Appropriate ergonomic bank design, including table and chair, computer monitor, optimal room temperature and other factors are very important for increasing employee productivity and preventing health problems caused by forced work postures and stress at work. Thus, work organizational measures aimed at preventing ergonomic risks at work and reducing health problems caused by psychosocial risks are essential in every workplace (Deshpande, 2013).

Aim of the research is to investigate the interaction of physical and mental strain on office workers in the banking sector in Latvia based on questionnaire and NASA-TLX method application results.

2. Methods and materials

2.1. Questionnaire

The questionnaire was used in this research which was developed based on modified Nordic Musculoskeletal Questionnaire (Kuorinka et al., 1987). The modified questionnaire was used to assess WRMSDs in individual body parts and have integrated additional questions regarding body postures, job demands and social support (Roja et al., 2013). The questionnaire was conducted on a voluntary basis. Respondents provided information regarding their gender, age, occupation, length of service, specific job responsibilities within banking sector. The questioner included questions about working hours with digital devices, behavioral habits, and leisure activities (including smoking, alcohol consumption, daily physical activity a.o.). Respondents answered the questions by marking defined options or providing their own answers. At the end of the questionnaire, respondents had the opportunity to provide their own perspective on the problems related to the interaction of physical and mental stress at work.

2.2. NASA Task Load Index

The NASA Task Load Index (NASA-TLX) method was used to evaluate perceived physical and mental workload (Hart, 2006; Noyes & Bruneau, 2007). This is a subjective workload assessment tool which allows to perform subjective workload assessments on operator`s work with various human-machine interface systems. This method is a multidimensional rating system for assessment of general or total workload based on results of the six subscales: mental demand (how much thinking, deciding, or calculating was required to perform the task), physical demand (the amount and intensity of physical activity required to complete the task), temporal demand (the amount of time pressure involved in completing the task), effort (how hard does the participant have to work to maintain their level of performance), performance (the level of success in completing the task), frustration level (how insecure, discouraged, or secure or content the participant felt during the task). The respondents must do a self-rate on a scale of 1 (low) to 20 (high) displayed as a numerical value out of 100 in increments of 5. Fifteen pairwise combinations designed to elicit from the participants the pair that has the greatest effect on workload while performing the task.

2.3. Background factors

Altogether 750 banking sector employees participated in the research, of which 473 (63.1%) were females, but 277 (36.9%) males. Various age groups were investigated in the range from 18–77 years and with various length of service. Participants were assured of confidentiality and anonymity, and the survey was conducted on a voluntary basis. Background factors of research participants are shown in Table 1.

Table 1. Background factors of research participants (n = 750)

Variable		Participants (n = 750)	%
Gender of employee	Female	473	63.10
	Male	277	36.90
Age group	18–25 years	150	20.99
	26–35 years	199	26.71
	36–45 years	252	33.29
	46–55 years	98	13.31
	56–65 years	42	5.29
	66–77 years	9	1.31
Length of service in the profession	up to 1 year	103	13.33
	1 to 5 years	256	33.32
	6 to 20 years	294	41.00
	21 and over	97	13.30

3. Results and discussion

The questionnaire results showed that more people were employed in the 36–45 age group (33.29%), and in the 26–35 age group (26.70%). The lowest number of employed bank employees was in the age group of 66 to 77 years (1.31%), but the youngest employees (18 to 25 years old) accounted for 20.99% of the total number of employees. Analyzing the length of service of the employees, it was found that 41% of employees had 6–20 years of service and 33.32% had 1–5 years of service. Another research show that more women than men are employed

in banks and have a combined length of service of 15 years or more (Silva & Barreto, 2012). Comparing banking sector employees by age groups, it was found that employees in the age group 36–45 years are more experienced than employees in other age groups (see Table 1). Majority of bank employees (67%) indicated that they engage in sport activities when they have free time, only some consume alcohol (27%), but more than half (54%) do not drink at all. Another habit is smoking (49%) and only some (38%) do physical relaxation exercises during their leisure breaks. The modified Nordic questionnaire results are shown in Table 2.

Table 2. Modified Nordic musculoskeletal questionnaire results

Variable	Male (n = 277)		Female (n = 473)	
	Number	%	Number	%
Neck	138	49.82	269	56.87
Shoulder	201	72.56	297	62.79
Elbow	66	23.83	91	19.24
Wrist/hands	157	56.68	143	30.23
Upper back	114	41.16	257	54.33
Low back	180	64.98	341	72.09
Hip/Thigh	54	19.49	98	20.72
Knee	12	4.33	34	7.19
Ankle/Shank/Feet	23	8.30	65	13.74
Awkward posture	214	77.26	368	77.80
Physical exhaustion	138	49.82	402	84.99
High-speed work	98	35.38	284	60.04
Excessive tasks	148	53.43	299	63.21
Too many job tasks	146	52.71	361	76.32
Supervisors` support	258	93.14	402	84.99
Colleagues` support	241	87.00	430	90.91

The results indicate significant differences in the prevalence of physical complaints between male and female respondents. Among males, 49.82% reported neck discomfort, 72.56% reported shoulder discomfort, and 64.98% reported low back discomfort. Females reported higher rates of discomfort in several areas, including the neck (56.87%), shoulder (62.79%), and low back (67.44%). Additionally, 60.0% of females reported wrist/hands discomfort compared to 57.14% of males. These findings suggest that female employees are more likely to experience physical discomfort in multiple body parts. In other findings, scientists suggest that office workers suffers discomfort (pain) in the lower back and the upper extremities (especially at neck, shoulder, elbow, wrist and arm) of the body due to working in a prolonged period of time in compulsory work positions (Das & Ghosh, 2011). This study also stated that both male and female office workers suffered from visual stress due to prolonged period of work and without using of antiglare screen in a monitor, that was not evaluated in our research.

Psychosocial complaints also varied between genders. Male respondents primarily reported physical exhaustion (70.04%) and high-speed work (53.43%) as significant issues. Conversely, female respondents reported higher levels of physical exhaustion (84.59%), high-speed work (67.44%), and excessive work-related tasks (61.95%). Furthermore, 90.91% of females reported having too many job tasks, compared to 87.70% of males. These results highlight the greater sensitivity of female employees to psychosocial risks in the workplace. The results are consistent with other research findings, which has shown that women are more susceptible to ergonomic and psychoemotional risks than men (Afsharian et al., 2023; Christensen et al., 2018; Collins & O'Sullivan, 2015).

Also, other authors indicate that adverse ergonomic risks influence health problems-stress from psychosocial risks (Deshpande, 2013). Researchers have also shown that working in compulsory postures contributes to increased mental strain and recommends that the interaction between physical and mental strain in workplaces should be evaluated, as often employees are exposed to both physical and mental demands simultaneously at work, resulting not only in mental strain-related health problems but also increased WRMSDs (Nino et al., 2023). Bank employees have a high degree of autonomy. This is evidenced by the results of the Eurofound survey, which indicated that 60% of financial services employees have freedom of autonomy in terms of the pace of their work (Eurofound, 2021). The higher prevalence of complaints among females underscores the need for targeted interventions to address these risks. Implementing ergonomic improvements and providing psychosocial support could help mitigate these issues and improve overall employee well-being.

Participants in the research were asked to rate their perceived workload with NASA-TLX method for all dimensions (mental, physical, temporal, performance, effort, frustration). Each dimension was rated on a scale from 0 to 100, with higher scores indicating greater perceived workload. The data were collected separately for male and female employees (see Table 3).

Table 3. NASA-TLX scores for males and females in the banking sector

Dimension	Males (n = 277), Mean±SD	Females (n = 473), Mean±SD	t-value	p-value
Mental demand	65.4±15.2	72.3±14.8	–5.23	<0.001
Physical demand	58.7±13.9	64.1±13.5	–4.56	<0.001
Temporal demand	62.5±14.7	68.9±14.3	–4.89	<0.001
Performance	70.2±12.8	75.6±12.4	–4.72	<0.001
Effort	66.8±14.1	73.4±13.7	–5.12	<0.001
Frustration	60.3±15.0	67.8±14.6	–5.01	<0.001

In Table 3 are represented the NASA TLX scores with statistical analysis comparing the NASA-TLX scores between male and female employees. The analysis involved calculating the mean and standard deviation for each dimension, followed by conducting t-tests to determine if the differences between the two groups were statistically significant. The mean scores and standard deviations for each dimension are presented, showing the main differences in perceived workload between the two groups. The t-values and p-values indicate that all differences are statistically significant, with p-values less than 0.001. This analysis underscores the importance of addressing gender differences in perceived workload within the banking sector. Female employees reported higher scores across all NASA-TLX dimensions, suggesting greater cognitive and emotional strain. These results are in accordance with other research findings. A study using NASA-TLX by Rubio et al. (2004) found that among Information Technology (IT) sector professionals that employees reported high levels of frustration and performance demands, with mean scores of 66.0 and 72.0, respectively. These findings align with our results, where female banking employees reported also frustration and performance scores of 67.8 and 75.6, respectively. This suggests that high-performance expectations and frustration are prevalent in both IT and banking sectors. Implementing strategies to manage workload effectively and provide adequate support can help mitigate these risks, particularly for female employees.

A study on the interaction effects of physical and psychosocial factors on neck pain and disability in female office workers showed that high decision-making freedom, skill discretion and supervisor support reduce the effects of several physical risk factors on woman neck pain. At the same time, the authors conclude that office workers who are exposed to high physical demands and psychosocial stressors at work are more likely to report neck pain and greater absence due to illness at work (Johnston, 2016).

4. Conclusions

Bank employees are exposed to physical and psychosocial risks at work. This type of study, with the application of used methods, can be considered as appropriate for assessing the physical and mental risk factors of banking sector employees. Accordingly, to modified Nordic questionnaire, banking sector female employees reported higher rates of discomfort in multiple body parts, including the neck, shoulder, wrist/hands, and lower back. Additionally, females were more likely to report physical exhaustion, high-speed work, and excessive tasks as significant issues. It was also proved with NASA-TLX method, where female employees reported significantly higher scores in all measurement dimensions. This indicates that female employees experience greater cognitive and emotional strain in their roles. Interaction between physical and mental risk factors at the banking sector work environment can cause significant health and work efficiency issues, hence solutions regarding work organization for better scheduling and task distribution could help mitigate mentioned risk factors and improve overall employee well-being and efficiency in the banking sector. Further research is needed to explore the underlying factors contributing to gender differences in perceived workload and to develop scientifically evidence-based interventions that address these needs and focus also on work efficiency issues. Longitudinal studies could provide deeper insights into the long-term effects of workload on employee health and productivity.

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