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Daiva
DUDUTIENĖ

Use of Scientific Knowledge in the Development of Evidence-Based Safety and Health Policies for Health Workers in the Context of Psychosocial Risk Management

SUMMARY OF DOCTORAL DISSERTATION

Medicine and Health Sciences,
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The dissertation was prepared at Vilnius University over a period from 2015 to 2021.

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Daiva
DUDUTIENĖ

Mokslo žinių panaudojimas formuojant įrodymais pagrįstą sveikatos priežiūros darbuotojų saugos ir sveikatos politiką psichosocialinių rizikos veiksnių valdymo kontekste

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1. INTRODUCTION

1.1. Relevance of the dissertation

Psychosocial risks and work-related stress are one of the biggest problems affecting both employees' health and organizational performance.

Psychosocial risks can be posed by a variety of factors related to work organization and management, job content, work environment, and other environmental and organizational conditions. Examples of conditions leading to psychosocial risks at work are excessive workloads; lack of control over work pace and methods; conflicting demands and lack of role clarity; lack of participation in decision-making; ineffective communication; lack of support from management or colleagues; poor relationships with colleagues, bullying, harassment and violence. Uncontrolled or poorly managed psychosocial risks result in stress at work. Workers suffering from prolonged stress can go on to develop serious mental and physical health problems such as depression or cardiovascular disease. Stress at work can also have negative consequences for organizations, such as poor performance, increased absenteeism, as well as increased accident and injury rates.

Psychosocial risks have been identified as one of the key emerging risks in the workplace in the European Union. Thus, the assessment and elimination or reduction of psychosocial risks in the workplace is the main priority of the EU's occupational safety and health policy. Work environment research plays a central role in managing psychosocial risks and thus ensuring the safety, health and well-being of workers in the workplace. "It provides arguments and scientific evidence upon which efficient and sustainable policies and prevention measures have to be based. It also delivers the evidence base for the development of practical methods and tools to be applied at the company level" [1].

Despite a common understanding of psychosocial risks and ample evidence of the negative impact of these risks on workers' health and organizational performance, the biggest problem still prevails – psychosocial risk management and the practical application of empirical research findings. Policy-makers, practitioners and researchers acknowledge that a great deal is known about the sources of stress at work, how to measure it, and the impact on a range of outcome indicators, but there is still a lack of a systematic approach and a translation of these results into practice [2;3]. Studies on the effectiveness of organizational interventions to mitigate, reduce, or eliminate some of psychosocial risk determinants are still scarce and their results are mixed. Researchers recognize that "standard quasi-experimental design has serious limitations when it comes to evaluating real-life interventions" [4]. One reason for this may be that many of these studies do not consider the heterogeneity of interventions as well as a range of other aspects (e.g. individual, organizational, cultural, social, regulatory); it is unclear which of these aspects are more or less important, including who and in what context is affected by them. A multiple approach may enable an employer to make "an assessment of its relative position (compared to "the average employee" and to specific norm-scores of the branch) and to make internal comparisons between departments or groups in the organization (on the basis of age, gender, blue versus white collar, and so on)" [5]. In addition, many researchers point to the need for studies on the role of the organizational context and the tailoring of organizational interventions to a specific organization rather than the other way around.

Healthcare institutions are specific organizations whose activities are strictly regulated and controlled by the national authorities. These institutions are likely to comprise competing and overlapping professional groups, while a key challenge lies in carefully considering the impact of change on specific groups (e.g. doctors, nurses, and other health professionals and managers) and designing appropriate policies [6]. Thus, the research should focus on gathering

and analyzing the differences of groups' attitudes (based on gender, age, job seniority, education, and occupational status) toward psychosocial risk determinants and organizational intervention objects to obtain information that is not captured by the dominant paradigm [7].

1.2. Objective of the dissertation

To determine the attitudes of healthcare workers towards psychosocial risk determinants and organizational intervention objects and the level of stress in a primary healthcare institution, considering the sociodemographic characteristics of medical staff and the context of the institution.

1.3. Tasks of the dissertation

1. To identify and evaluate the stress levels and the psychosocial risk determinants perceived by health workers in the context of the institution.
2. To identify and evaluate the levels of prevention and organizational intervention objects perceived by health workers in the context of the institution.
3. To identify and compare the attitudes of sociodemographic groups of health workers towards work-related stress and psychosocial risk determinants.
4. To identify and compare the attitudes of sociodemographic groups of health workers towards the institution's efforts to manage psychosocial risks.

1.4. Statements to be defended

1. The organizational context conditions the predominant psychosocial risk determinants and the health workers' attitude towards the organizational intervention objects.

2. Stress at work, psychosocial risk determinants, and organizational intervention objects are perceived differently among the sociodemographic groups of health workers in the institution.

3. Occupation (position) is the key sociodemographic characteristic that should be considered when managing psychosocial risks in a healthcare institution.

4. A consideration of the organizational context and sociodemographic characteristics helps to better tailor psychosocial risk prevention and protection measures.

1.5. Scientific novelty and significance of the dissertation

Most studies are limited to an analysis of several psychosocial risks or stress management interventions regardless of organizational context, job and workers' characteristics. In Lithuania, studies have tended to focus almost exclusively on the negative impacts of work on well-being and, more specifically, on the impact of work-related stress on health. There is also no systematic approach to assessing factors in the well-being of health workers.

The novelty of this dissertation is in its proposed and empirically tested scientific knowledge-based model of psychosocial work environment diagnosis as an incentive for researchers to further develop a comprehensive approach to stress management at work in Lithuania. Findings presented in this dissertation can also serve as a basis for developing stress management programs in primary healthcare institutions and as an encouragement for new theories in qualitative studies.

In addition, the dissertation contributes to bridging the gap between theoretical knowledge and practical solutions in occupational stress management in primary healthcare settings.

2. RESEARCH MATERIAL AND METHODS

2.1. Research strategy

The research methodology is based on a positivist philosophy and a deductive approach, using quantitative data obtained through self-administered questionnaires that aims to measure the phenomenon or object in numerical form (its prevalence, attitudes of various groups to the main characteristics of the research object etc.) [8].

First, a theoretical model was developed on the basis of the analysis of stress management theories found in the scientific literature. Second, the model was empirically tested to analyze healthcare workers' attitudes towards psychosocial risk determinants and organizational intervention objects, and stress levels in the primary healthcare institution, considering the sociodemographic characteristics of medical staff and the context of the institution. Thus, a two-step diagnosis of the psychosocial work environment was performed: at the level of the institution and at the level of health workers (Figure 1).

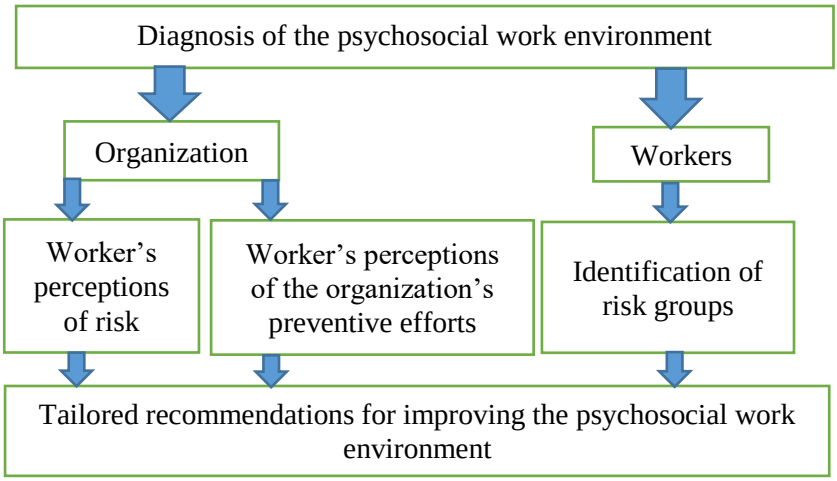


Figure 1. Model of psychosocial work environment diagnosis

First step of diagnosis. Based on the findings of the research, the predominant psychosocial risk determinants and the priority of organizational intervention objects at the institutional level were determined. The findings of the research were assessed using the traffic light principle considering the Stress and psychosocial risk management e. manual and other practical tools and recommendations published on the website of the European Agency for Safety and Health at Work [9] (Table 1 and 2).

Table 1. Workers' perceived psychosocial risk in the context of the institution

No risk	Risk	Hight risk
Risk determinants with a level up to 30%	Risk determinants with a level between 30 and 60%	Risk determinants with a level over 60%

Table 2. Workers' attitude towards the organizational intervention objects in the context of the institution

Hight prevention	Prevention should be evaluated (It is recommended to pay attention to these objects when improving the organization's internal policies)	No prevention (These objects must be addressed by improving the organization's internal policies)
Organizational intervention objects with a level over 60%	Organizational intervention objects with a level between 30 and 60%	Organizational intervention objects with a level up to 30%

Second step of diagnosis. Based on the findings of the research, the risk groups, predominant psychosocial risk determinants, and the priority of organizational intervention objects were determined in each sociodemographic group of health workers.

2.2. Study sample and design

This is a cross-sectional study designed to examine health workers' attitudes toward the psychosocial risk determinants and organizational intervention objects using a complex quantitative tool based on sociodemographic characteristics. All data were collected by paper questionnaires from February to March 2017. The sample consisted of 467 health workers employed in one of the largest primary healthcare institutions (six primary healthcare institutions were merged into one in 2002) in Lithuania. The institution employed 690 health workers in 2017. All health workers were invited to participate in the study. At the start of the study, health workers were provided with information about the study, and 690 paper questionnaires were distributed; 468 questionnaires were returned compiled, one of which was damaged; 467 questionnaires (a response rate of 68%) were suitable for the analysis of the research results.

2.3. Ethical considerations

Participation in the survey was voluntary with guaranteed anonymity and confidentiality under Lithuanian law, which does not require ethical approval for this type of study. The study was authorized by the administration of the institution.

2.4. Instruments/measures

The self-administrated questionnaire was used as an instrument for data collection. The instrument contained items adopted from an established questionnaire that was used for a complex stress management study at Lithuanian automation and electrotechnical companies [10]. The questionnaire consisted of 67 items, divided into three parts related to common psychosocial risk determinants, organizational intervention objects, and sociodemographic

characteristics; Cronbach's alpha was 0.89 for the general scale. However, before using the instrument in this study, it was subjected to a pilot testing during which 50 questionnaires were administered to 50 health workers in the institution. After the pilot study and a discussion with the academic supervisor of the present work, an abridged and adapted to health-work version of the validated instrument was used:

-Fifteen items for psychosocial risks and stress diagnosis: hazardous working conditions; work overload; excessive work pace; overtime; tight deadlines; unclear role; conflicting roles; being under-skilled for a job; responsibility for decision-making and actions; lack of control over work pace; lack of control over work method; interpersonal relationships (harassment, conflicts, and tension) and level of stress. Cronbach's alpha = 0.702;

-Twenty-seven items for organizational intervention object ascertainment: social support (5 items; Cronbach's alpha = 0.704), organizational support (4 items; Cronbach's alpha = 0.708), participation in decision-making (3 items; Cronbach's alpha = 0.66); communication (4 items; Cronbach's alpha = 0.728); justice of reward (2 items; Cronbach's alpha = 0.756); manager feedback (5 item; Cronbach's alpha = 0.738); stress management training (1 item); work-life balance (1 item); skills/abilities matching the job demands (1 item); and variety of tasks (1 item);

-Five groups on the basis of sociodemographic characteristics: gender (male, female), age (coded on four levels: ≤30,]30–40],]40–50], and >50 years), job seniority (coded on four levels: ≤3,]3–5],]5–10], and >10 working years), educational level (coded on three levels: university degree, higher school/college degree, and other degree), and occupational status (coded on four levels: heads of units, doctors, nurses, and other health workers (ergotherapists, masseurs, etc.)).

In total, the questionnaire consisted of 46 items, which were rated on a 5-point frequency scale ranging from 1 (never or strongly disagree) to 5 (always or strongly agree). Prior to analyses, some items of the questionnaire were reversed so that higher scores showed a

greater negative impact of psychosocial risk determinants and greater prevention relevant to organizational intervention objects.

2.5. Statistical analysis

Data were analyzed using the statistical software package IBM SPSS Statistics (Vilnius University, Vilnius, Lithuania). In all analyses, statistical significance was considered with a p-value < 0.05 and a 95% confidence interval (CI). Descriptive statistics were used to summarize and describe data collected from the institution. The normality test (the Shapiro–Wilk test) showed that data were not normally distributed; therefore, nonparametric tests for comparisons of the groups (the Mann–Whitney test for comparisons of two groups and the Kruskal–Wallis test for comparisons of more than two groups) were used. Subsequently, pairwise comparisons were performed using Dunn's procedure with a Bonferroni correction for multiple comparisons.

3. RESEARCH RESULTS

3.1. Sociodemographic characteristics of respondents

Table 3 describes the sociodemographic groups among the institution's staff. As is the case for many Lithuanian healthcare institutions, the results showed a predominance of women (94.9%). Health workers were aged 22 to 73 years old. Almost half of health workers (47.9%) were over 50 years of age. More than half of all health workers (52.9%) had university degrees, 38.5% of health workers had higher school degrees, and 8.6% of health workers had other levels of education. The majority of health workers were nurses (43.9%), followed by doctors (28.3%), other health workers (21.6%), and heads of units (6.2%). The job seniority of these workers ranges

from a few months to 48 years; 350 of the health workers in the institution had worked there for over 10 years (76.1%).

Table 3. Groups on the basis of sociodemographic characteristics

Groups		*N**	%
Gender	Male	24	5.1
	Female	443	94.9
	Total	467	100
Age	≤30	48	10.5
	]30–40]	68	14.8
	]40–50]	123	26.8
	>50	220	47.9
	Total	459	100
Education	University degree	247	52.9
	Higher school/college degree	180	38.5
	Other	40	8.6
	Total	467	100
Occupational status/groups	Heads of units	29	6.2
	Doctors	132	28.3
	Nurses	205	43.9
	Other health workers	101	21.6
	Total	467	100
Job seniority	≤3	49	10.7
	]3–5]	24	5.2
	]5–10]	37	8.0
	>10	350	76.1
	Total	460	100

- *N* sample sizes

3.2. Analysis of work-related stress, psychosocial risk determinants and organizational intervention objects at the level of the institution

According to the results of the research, 218 respondents (47%) were always or often stressed, 170 respondents (36%) were sometimes stressed, and 79 respondents (17%) were rarely or never stressed at work (Figure 2).

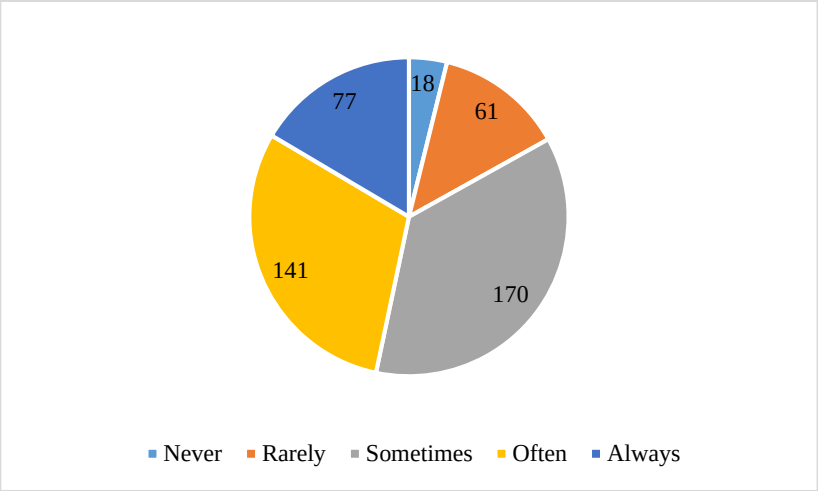


Figure 2. Distribution of respondents according to the frequency of stress experienced in the institution

The respondents' answers about perceived psychosocial risks are presents in Table 4. Responses to each psychosocial risk determinant are presented in percentages, e.g., the percentage of workers who selected each response related to the particular determinant.

Table 4. Summary of psychosocial risk determinants in the institution

	Hazardous working conditions	Work overload	Excessive work pace	Overtime	Tight deadlines	Unclear role	Conflicting roles	Being under-skilled for a job	Responsibility for decision-making and actions	Lack of control over work pace	Lack of control over work method	Harassment	Conflicts	Tension
Never / Strongly Disagree	**21.6**	**27.6**	**2.1**	**42.8**	**34.9**	**38.1**	**27.8**	**31.5**	**2.6**	**15.8**	**26.1**	**55.5**	**28.7**	**33.6**
Rarely / Disagree	**14.1**	**16.9**	**11.1**	**24.2**	**28.1**	**16.9**	**23.3**	**26.6**	**3.6**	**25.3**	**37.9**	**19.7**	**23.8**	**27.2**
Sometimes / Neither agree nor disagree	**24.6**	**25.7**	**36.4**	**18.6**	**22.7**	**22.7**	**29.6**	**25.7**	**15.6**	**29.8**	**25.9**	**15.8**	**25.9**	**24.6**
Often / Agree	**24**	**18.4**	**50.3**	**9.4**	**10.9**	**15.6**	**15.6**	**13.1**	**31.9**	**16.3**	**6.9**	**7.3**	**18.8**	**11.8**
Always / Strongly agree	**15.6**	**11.3**	**2.1**	**4.9**	**3.4**	**6.6**	**3.6**	**3.2**	**46.3**	**12.8**	**3.2**	**1.7**	**2.8**	**2.8**

The percentage sums of psychosocial risk determinants marked by respondents as always / strongly agree or often / agree, using the traffic light principle, are presented in Table 5.

Table 5. Health workers' perceived psychosocial risks in the context of the institution

No risk (Risk determinants with a level up to 30%)	Risk (Risk determinants with a level between 30 and 60%)	High risk (Risk determinants with a level over 60%)
1. Work overload (29.7%) 2. Lack of control over work pace (29.1%) 3. Unclear role (22.2%) 4. Conflicts (21.6%), 5. Conflicting roles (19.2%) 6. Being under-skilled for a job (16.3%) 7. Tension (14.6%), 8. Overtime (14.3%), 9. Tight deadlines (14.3%) 10. Lack of control over work method (10.1%) 11. Harassment (9%)	1. Excessive work pace (52.4%) 2. Hazardous working conditions (39.6%)	1. Responsibility for decision-making and actions (78.2 %)

Table 5 shows that the most frequently cited risk determinant was the responsibility. The overall percentage of respondents who answered that they strongly agree (46.3%) or agree (31.9%) that they have to take responsibility for the well-being and safety of other people was 78.2%, followed by excessive work pace (52.4%) and hazardous working conditions (39.6%). The less frequently chosen risk determinants were work overload (29.7%), lack of control over work pace (29.1%), unclear role (22.2%), conflicts (21.6%), conflicting roles (19.2%), being under-skilled for a job (16.3%),

tension (14.6%), overtime (14.3%), tight deadlines (14.3%), lack of control over work method (10.1%), harassment (9%).

The respondents' answers about organizational intervention objects are presented in Table 6. Responses to each organizational intervention object are presented in percentages, e.g. the percentage of workers who selected each response related to the particular object.

Table 6. Summary of organizational intervention objects in the institution

	Work–life balance	Skills/abilities matching to the job demands	Variety of tasks	Social support	Organizational support	Participation in decision-making	Communication	Justice of reward	Manager feedback	Stress management training
Never / Strongly disagree	**8.8**	**2.8**	**16.1**	**0.6**	**9.1**	**2.1**	**1.5**	**18.4**	**4.1**	**19.9**
Rarely / Disagree	**14.8**	**4.3**	**19.7**	**4.9**	**28**	**15.8**	**10.5**	**29.6**	**13.9**	**22.9**
Sometimes / Neither agree, nor disagree	**18.2**	**21.6**	**23.6**	**36.2**	**45.8**	**41**	**39.6**	**32.5**	**40.5**	**27.2**
Often / Agree	**20.3**	**33**	**21.8**	**46.7**	**14.7**	**32.3**	**40.9**	**16.7**	**33.8**	**19.5**
Always / Strongly agree	**37.9**	**38.3**	**18.8**	**11.6**	**2.4**	**8.8**	**7.5**	**2.8**	**7.7**	**10.5**

The percentage sums of organizational intervention objects marked by respondents as always / strongly agree or often / agree, using the traffic light principle, are presented in Table 7.

Table 7. Health workers' attitudes towards the organizational intervention objects in the context of the institution

Hight prevention (Organizational intervention objects with a level over 60%)	Prevention should be evaluated (Organizational intervention objects with a level between 30 and 60%. It is recommended to pay attention to these objects when improving the organization's internal policies)	No prevention (Organizational intervention objects with a level up to 30% must be addressed by improving the organization's internal policies)
1. Skills/abilities matching to the job demands (71.3%)	1. Social support (58.3%) 2. Work-life balance (58.2%) 3. Communication (48.4%) 4. Manager feedback (41.5%) 5. Participation in decision-making (41.1%) 6. Variety of tasks (40.6%)	1. Stress management training (30%) 2. Justice of reward (19.5%) 3. Organizational support (17.1%)

Table 7 shows that respondents were most often satisfied with the institution's efforts to ensure skills and abilities matching to the job demands (71.3%); 38.3% of respondents strongly agree and 33% of respondents agree that "the job gives them the opportunity to do what they do best." Respondents were also satisfied with social support (58.3%), the work-life balance (58.2%), communication (48.4%), manager feedback (41.5%), participation in decision-making (41.1%), and variety of tasks (40.6%). The adequacy of stress management training (30%), the justice of reward (19.5%), and organizational support (17.1%) were rated the lowest.

3.3. Analysis of work-related stress, psychosocial risk determinants and organizational intervention objects at the level of health workers

Tables 8–22 present the attitudes of the health workers' sociodemographic groups to the psychosocial risk determinants and stress, and organizational intervention objects (mean ranks, sample sizes (N), U values (the Mann–Whitney U-test) or $\chi 2$ values, with k-1 degrees of freedom (the Kruskal–Wallis test) and significance levels (p)).

Gender. The observed differences by gender in the institution was not statistically significant except in the work-life balance, U = 3789, p = 0.01. Women (237.45) showed higher work-life balance scores than men (170.38) (p = 0.01) (Tables 8, 9 and 10).

Table 8. Stress at work and gender results of the Mann–Whitney U-test

Groups	*N*	Mean rank	*U*	*p*
Male	24	205.38	4629.00	0.27
Female	443	235.55		

Table 9. Psychosocial risk determinants and gender results of the Mann–Whitney U-test

Variables	Male		Female		*U*	*p*
	Mean rank	*N*	Mean rank	*N*		
Hazardous working conditions	259.38	24	232.63	443	4707.00	0.33
Work overload	245.38	24	233.38	443	5043.00	0.66
Excessive work pace	228.96	24	234.27	443	5195.00	0.84
Overtime	222.73	24	234.61	443	5045.50	0.66
Tight deadlines	250.25	24	233.12	443	4926.00	0.53
Unclear role	227.79	24	234.34	443	5167.00	0.81
Conflicting roles	260.98	24	232.54	443	4668.50	0.30
Being under-skilled for a job	210.65	24	235.27	443	4755.50	0.37
Responsibility for decision-making and actions	250.25	24	233.12	443	4926.00	0.52
Lack of control over work pace	211.17	24	235.24	443	4768.00	0.38
Lack of control over work method	255.50	24	232.84	443	4800.00	0.40
Harassment	240.42	24	233.65	443	5162.00	0.79
Conflicts	253.29	24	232.95	443	4853.00	0.46
Tension	241.08	24	233.62	443	5146.00	0.78

Table 10. Organizational intervention objects and gender results of the Mann–Whitney U-test

Variables	Male		Female		*U*	*p*
	Mean rank	*N*	Mean rank	*N*		
Work-life balance	170.38	24	237.45	443	3789.00	0.01
Skills/abilities matching to the job demands	204.90	24	235.58	443	4617.50	0.25
Variety of tasks	220.42	24	234.74	443	4990.00	0.60
Social support	215.81	24	234.99	443	4879.50	0.50
Organizational support	208.90	24	235.36	443	4713.50	0.35
Participation in decision-making	198.54	24	235.92	443	4465.00	0.18
Communication	198.02	24	235.95	443	4452.50	0.18
Justice of reward	202.00	24	235.73	443	4548.00	0.23
Manager feedback	230.58	24	234.19	443	5234.00	0.90
Stress management training	230.63	24	234.18	443	5235.00	0.90

Age. Table 11 shows that there were no statistically significant differences among the four age groups of respondents with respect to stress at work, $\chi 2\ (3) = 1.77$, $p = 0.65$.

Table 11. Stress at work and age results of the Kruskal–Wallis test

Groups	*N*	Mean rank	*χ2(3)*	*p*
≤30	48	216.94	1.77	0.65
]30–40]	68	233.26		
]40–50]	123	221.74		
>50	220	236.46		

Only excessive work pace ($\chi 2\ (3) = 17.36$, $p < 0.01$) as a psychosocial risk determinant (Table 12), and the justice of reward ($\chi 2\ (3) = 12.44$, $p < 0.01$) and matching to the job demands ($\chi 2\ (3) = 13.41$, $p < 0.01$) as organizational intervention objects (Table 13) had mean rank scores differing statistically significant across age groups.

Table 12. Psychosocial risk determinants and age group results of the Kruskal–Wallis test

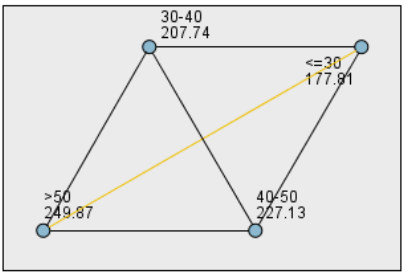
Variables	≤30		]30–40]		]40–50]		>50		$\chi^2(3)$	*p*
	Mean rank	*N*	Mean rank	*N*	Mean rank	*N*	Mean rank	*N*		
Hazardous working conditions	229.53	48	226.44	68	225.26	123	233.85	220	0.41	0.94
Work overload	212.23	48	227.40	68	218.34	123	241.2	220	3.58	0.31
Excessive work pace	177.81	48	207.74	68	227.13	123	249.87	220	17.36	<0.01
Overtime	199.69	48	229.10	68	233.84	123	234.75	220	3.21	0.36
Tight deadlines	209.72	48	243.88	68	242.37	123	223.22	220	3.80	0.28
Unclear role	198.13	48	217.11	68	224.30	123	244.13	220	6.63	0.08
Conflicting roles	208.38	48	208.74	68	254.01	123	227.87	220	7.60	0.05
Being under-skilled for a job	190.92	48	216.49	68	240.98	123	236.56	220	6.72	0.08
Responsibility for decision-making and actions	253.69	48	236.07	68	220.58	123	228.22	220	2.69	0.44
Lack of control over work pace	277.73	48	232.26	68	222.39	123	223.14	220	7.63	0.05
Lack of control over work method	247.51	48	259.38	68	226.01	123	219.33	220	6.27	0.10
Harassment	231.72	48	233.09	68	246.96	123	219.19	220	4.30	0.23
Conflicts	229.10	48	253.68	68	224.42	123	226.00	220	2.76	0.43
Tension	228.82	48	246.32	68	224.31	123	228.39	220	1.40	0.71

Table 13. Organizational intervention objects and age group results of the Kruskal–Wallis test

Variables	≤30		]30–40]		]40–50]		>50		$\chi^2(3)$	*p*
	Mean rank	*N*	Mean rank	*N*	Mean rank	*N*	Mean rank	*N*		
Work-life balance	252.97	48	212.99	68	237.13	123	226.26	220	3.33	0.34
Skills/abilities matching to the job demands	202.26	48	189.69	68	232.65	123	247.03	220	13.41	<0.01
Variety of tasks	227.97	48	237.47	68	228.49	123	228.98	220	0.27	0.96
Social support	222.32	48	209.81	68	231.98	123	236.81	220	2.36	0.51
Organizational support	243.05	48	223.24	68	234.60	123	226.67	220	0.94	0.81
Participation in decision-making	226.19	48	210.75	68	230.41	123	236.55	220	2.04	0.56
Communication	230.20	48	201.90	68	225.49	123	241.16	220	4.80	0.19
Justice of reward	278.61	48	247.19	68	235.06	123	211.25	220	12.44	<0.01
Manager feedback	223.95	48	228.51	68	230.33	123	231.60	220	0.14	0.99
Stress management training	191.66	48	218.25	68	238.30	123	237.36	220	6.00	0.11

Subsequently, pairwise comparisons were performed using Dunn's procedure with a Bonferroni correction for multiple comparisons. This post hoc analysis revealed a statistically significant difference in excessive work pace scores between oldest group of health workers (>50) (249.87) and the youngest group of health workers (≤30) (177.81) ($p < 0.01$) (Figure 3).

Pairwise Comparisons of Age group



Each node shows the sample average rank of Age group.

Sample1-Sample2	Test Statistic	Std. Error	Std. Test Statistic	Sig.	Adj.Sig.
<=30-30-40	-29.930	22.728	-1.317	.188	1.000
<=30-40-50	-49.314	20.518	-2.403	.016	.097
<=30->50	-72.060	19.206	-3.752	.000	.001
30-40-40-50	-19.383	18.218	-1.064	.287	1.000
30-40->50	-42.130	16.727	-2.519	.012	.071
40-50->50	-22.747	13.573	-1.676	.094	.563

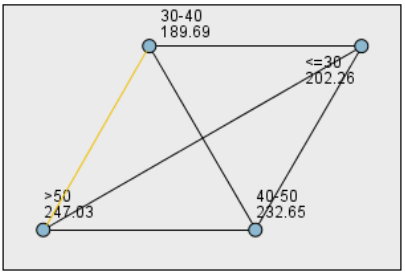
Each row tests the null hypothesis that the Sample 1 and Sample 2 distributions are the same.
Asymptotic significances (2-sided tests) are displayed. The significance level is .05.

Figure 3. Difference in excessive work pace scores among age groups

The post hoc analysis also revealed statistically significant differences in:

- skills/abilities matching to the job demands scores between the oldest group of health workers (247.03) and the 30–40 age group of health workers (189.69) ($p < 0.01$) (Figure 4),

Pairwise Comparisons of Age group



Each node shows the sample average rank of Age group.

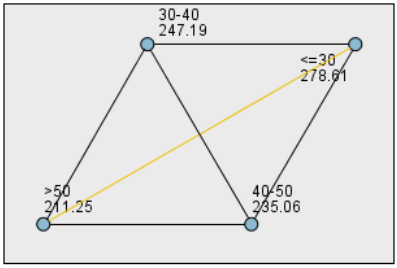
Sample1-Sample2	Test Statistic	Std. Error	Std. Test Statistic	Sig.	Adj.Sig.
30-40-<=30	12.569	23.709	.530	.596	1.000
30-40-40-50	-42.963	19.005	-2.261	.024	.143
30-40->50	-57.336	17.450	-3.286	.001	.006
<=30-40-50	-30.394	21.403	-1.420	.156	.934
<=30->50	-44.767	20.035	-2.234	.025	.153
40-50->50	-14.373	14.159	-1.015	.310	1.000

Each row tests the null hypothesis that the Sample 1 and Sample 2 distributions are the same.
Asymptotic significances (2-sided tests) are displayed. The significance level is .05.

Figure 4. Differences in skills/abilities matching to the job demands scores among age groups

- justice of reward scores between the oldest group of health workers (211.25) and the youngest group of health workers (278.61) ($p < 0.01$) (Figure 5).

Pairwise Comparisons of Age group



Each node shows the sample average rank of Age group.

Sample1-Sample2	Test Statistic	Std. Error	Std. Test Statistic	Sig.	Adj.Sig.
>50-40-50	23.805	14.768	1.612	.107	.642
>50-30-40	35.939	18.199	1.975	.048	.290
>50-<=30	67.362	20.896	3.224	.001	.008
40-50-30-40	12.134	19.822	.612	.540	1.000
40-50-<=30	43.558	22.323	1.951	.051	.306
30-40-<=30	31.423	24.728	1.271	.204	1.000

Each row tests the null hypothesis that the Sample 1 and Sample 2 distributions are the same.
Asymptotic significances (2-sided tests) are displayed. The significance level is .05.

Figure 5. Differences in justice of reward scores among age groups

Job seniority. Table 14 shows that there were no statistically significant differences among the four job seniority groups of respondents with respect to stress at work, $\chi 2\ (3) = 1.64$, $p = 0.62$.

Table 14. Stress at work and job seniority results of the Kruskal–Wallis test

Groups	*N*	Mean rank	*χ2(3)*	*p*
≤3	49	224.71	1.64	0.62
]3–5]	24	217.40		
]5–10]	37	208.89		
>10	350	234.49		

Excessive work pace ($\chi 2$ (3) = 20.36, $p < 0.01$) as a psychosocial risk determinant (Table 15), and the justice of reward ($\chi 2$ (3) = 22.91, $p < 0.01$), matching to the job demands ($\chi 2$ (3) = 13.07, $p < 0.01$), and variety of tasks ($\chi 2$ (3) = 12.98, $p < 0.01$) as organizational intervention objects (Table 16) had mean rank scores differing statistically significant across job seniority groups.

Table 15. Psychosocial risk determinants and job seniority group results of the Kruskal–Wallis test

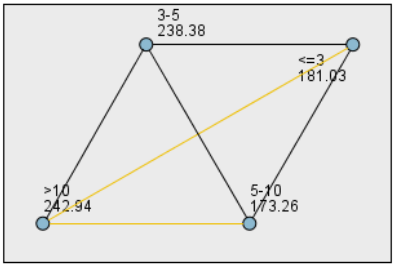
Variables	≤3		]3–5]		]5–10]		>10		$\chi^2(3)$	*p*
	Mean rank	*N*	Mean rank	*N*	Mean rank	*N*	Mean rank	*N*		
Hazardous working conditions	209.59	49	262.04	24	225.24	37	231.82	350	2.78	0.43
Work overload	221.77	49	206.17	24	215.36	37	234.99	350	1.99	0.57
Excessive work pace	181.03	49	238.38	24	173.26	37	242.94	350	20.36	<0.01
Overtime	200.22	49	264.67	24	232.39	37	232.20	350	4.67	0.20
Tight deadlines	223.78	49	248.33	24	206.72	37	232.73	350	2.00	0.57
Unclear role	214.83	49	189.77	24	210.69	37	237.58	350	5.14	0.16
Conflicting roles	201.95	49	253.58	24	213.88	37	234.67	350	4.17	0.24
Being under-skilled for a job	201.15	49	265.5	24	207.45	37	234.65	350	5.92	0.12
Responsibility for decision-making and actions	245.51	49	238.48	24	227.64	37	228.15	350	0.97	0.81
Lack of control over work pace	266.15	49	185.44	24	206.46	37	231.14	350	7.92	0.05
Lack of control over work method	235.12	49	244.90	24	215.16	37	230.49	350	0.92	0.82
Harassment	230.80	49	236.67	24	255.22	37	227.42	350	1.86	0.60
Conflicts	215.26	49	272.52	24	251.55	37	227.53	350	4.42	0.22
Tension	229.86	49	240.65	24	228.07	37	230.15	350	0.17	0.98

Table 16. Organizational intervention objects and job seniority group results of the Kruskal–Wallis test

Variables	≤3		]3–5]		]5–10]		>10		$\chi^2(3)$	*p*
	Mean rank	*N*	Mean rank	*N*	Mean rank	*N*	Mean rank	*N*		
Work-life balance	238.47	49	259.69	24	212.14	37	229.32	350	2.23	0.53
Skills/abilities matching to the job demands	181.48	49	255.65	24	194.91	37	239.40	350	13.07	<0.01
Variety of tasks	240.37	49	137.69	24	232.08	37	235.32	350	12.98	<0.01
Social support	227.55	49	255.31	24	219.93	37	230.33	350	1.10	0.78
Organizational support	241.46	49	257.73	24	241.74	37	225.91	350	2.04	0.56
Participation in decision-making	215.94	49	269.9	24	217.54	37	231.21	350	3.10	0.38
Communication	227.79	49	240.60	24	201.36	37	233.27	350	2.11	0.55
Justice of reward	288.12	49	290.73	24	268.65	37	214.27	350	22.91	<0.01
Manager feedback	212.77	49	280.75	24	230.74	37	229.51	350	4.34	0.23
Stress management training	191.08	49	241.29	24	230.18	37	235.31	350	5.18	0.16

The post hoc analysis revealed statistically significant differences in excessive work pace scores between health workers who had a tenure of more than 10 years (242.94) and the 5–10 year seniority group (173.26) ($p < 0.01$), and between health workers who had more than 10 years of tenure and health workers who had up to 3 years of tenure (181.03) ($p < 0.01$) (Figure 6).

Pairwise Comparisons of Job seniority group



Each node shows the sample average rank of Job seniority group .

Sample1-Sample2	Test Statistic	Std. Error	Std. Test Statistic	Sig.	Adj.Sig.
5-10-<=3	7.774	26.295	.296	.768	1.000
5-10-3-5	65.118	31.643	2.058	.040	.238
5-10->10	-69.680	20.871	-3.339	.001	.005
<=3-3-5	-57.344	30.080	-1.906	.057	.340
<=3->10	-61.907	18.415	-3.362	.001	.005
3-5->10	-4.562	25.475	-.179	.858	1.000

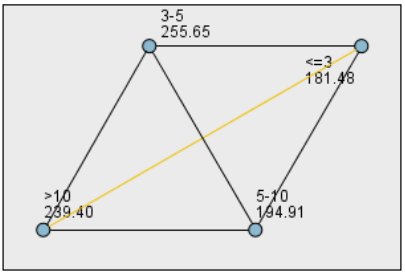
Each row tests the null hypothesis that the Sample 1 and Sample 2 distributions are the same.
Asymptotic significances (2-sided tests) are displayed. The significance level is .05.

Figure 6. Differences in excessive work pace scores among job seniority groups

The post hoc analysis also revealed statistically significant differences in:

- skills/abilities matching to the job demands scores between health workers who had more than 10 years of tenure (239.40) and health workers who had up to 3 years of tenure (181.48) (p = 0.02) (Figure 7),

Pairwise Comparisons of Job seniority group



Each node shows the sample average rank of Job seniority group .

Sample1-Sample2	Test Statistic	Std. Error	Std. Test Statistic	Sig.	Adj.Sig.
<=3-5-10	-13.426	27.446	-.489	.625	1.000
<=3->10	-57.922	19.221	-3.013	.003	.015
<=3-3-5	-74.166	31.397	-2.362	.018	.109
5-10->10	-44.496	21.785	-2.043	.041	.247
5-10-3-5	60.740	33.028	1.839	.066	.395
>10-3-5	16.244	26.590	.611	.541	1.000

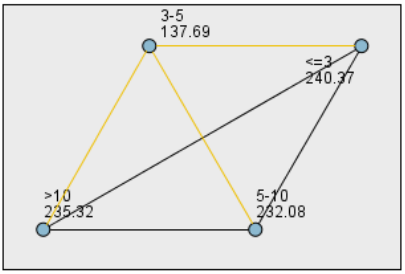
Each row tests the null hypothesis that the Sample 1 and Sample 2 distributions are the same.
Asymptotic significances (2-sided tests) are displayed. The significance level is .05.

Figure 7. Differences in skills/abilities matching to the job demands scores among job seniority groups

- variety of tasks scores between the 3–5 year seniority group (137.69) and other seniority groups: health workers who had up to 3 years of tenure (240.37) (p < 0.01), the 5–10 year seniority group

(232.08) (p = 0.03), and health workers who had more than 10 years of tenure (235.32) (p < 0.01) (Figure 8),

Pairwise Comparisons of Job seniority group



Each node shows the sample average rank of Job seniority group .

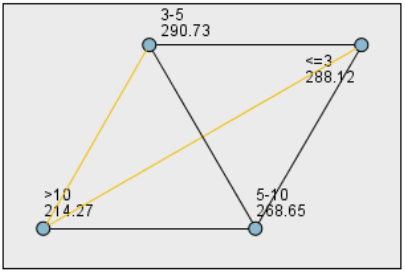
Sample1-Sample2	Test Statistic	Std. Error	Std. Test Statistic	Sig.	Adj.Sig.
3-5-5-10	-94.394	34.101	-2.768	.006	.034
3-5->10	-97.628	27.454	-3.556	.000	.002
3-5-<=3	102.680	32.417	3.168	.002	.009
5-10->10	-3.235	22.492	-.144	.886	1.000
5-10-<=3	8.286	28.337	.292	.770	1.000
>10-<=3	5.052	19.846	.255	.799	1.000

Each row tests the null hypothesis that the Sample 1 and Sample 2 distributions are the same.
Asymptotic significances (2-sided tests) are displayed. The significance level is .05.

Figure 8. Differences in variety of tasks scores among job seniority groups

- justice of reward scores between health workers who had more than 10 years of tenure (214.27) and health workers who had up to 3 years of tenure (288.12) (p < 0.01), and between health workers who had more than 10 years of tenure and the 3–5 year seniority group (290.73) (p = 0,04) (Figure 9).

Pairwise Comparisons of Job seniority group



Each node shows the sample average rank of Job seniority group .

Sample1-Sample2	Test Statistic	Std. Error	Std. Test Statistic	Sig.	Adj.Sig.
>10-5-10	54.379	22.724	2.393	.017	.100
>10-<=3	73.852	20.050	3.683	.000	.001
>10-3-5	76.459	27.737	2.757	.006	.035
5-10-<=3	19.474	28.630	.680	.496	1.000
5-10-3-5	22.081	34.453	.641	.522	1.000
<=3-3-5	-2.607	32.751	-.080	.937	1.000

Each row tests the null hypothesis that the Sample 1 and Sample 2 distributions are the same.
Asymptotic significances (2-sided tests) are displayed. The significance level is .05.

Figure 9. Differences in justice of reward scores among job seniority groups

Education. Table 17 shows that there were no statistically significant differences among the three education groups of respondents with respect to stress at work, $\chi 2$ (3) = 2.98, p = 0.23.

Table 17. Stress at work and education results of the Kruskal–Wallis test

Groups	*N*	Mean rank	*χ2(2)*	*p*
University	247	243.63	2.98	0.23
Higher school	180	224.26		
Other	40	218.40		

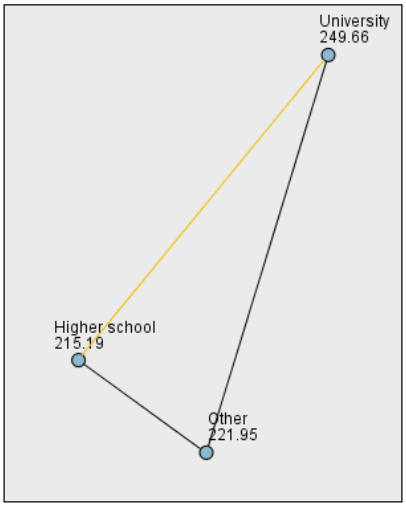
Four psychosocial risk determinants (overtime, $\chi 2$ (3) = 7.93, p = 0.02, unclear role, $\chi 2$ (3) = 21.26, p < 0.01, conflicting roles, $\chi 2$ (3) = 8.56, p = 0.01, and being under-skilled, $\chi 2$ (3) = 20.22, p < 0.01) had mean rank scores differing statistically significantly across education groups (Table 18).

Table 18. Psychosocial risk determinants and education group results of the Kruskal–Wallis test

Variables	University		Higher school		Other		$\chi^2(2)$	*p*
	Mean rank	*N*	Mean rank	*N*	Mean rank	*N*		
Hazardous working conditions	229.97	247	238.26	180	239.71	40	0.49	0.78
Work overload	235.40	247	235.93	180	216.69	40	0.76	0.68
Excessive work pace	222.64	247	251.31	180	226.26	40	5.88	0.05
Overtime	249.66	247	215.19	180	221.95	40	7.93	0.02
Tight deadlines	234.83	247	235.31	180	223.00	40	0.32	0.85
Unclear role	207.93	247	262.09	180	268.59	40	21.26	<0.01
Conflicting roles	220.63	247	241.75	180	281.68	40	8.56	0.01
Being under-skilled for a job	208.45	247	263.37	180	259.63	40	20.22	<0.01
Responsibility for decision-making and actions	242.40	247	228.50	180	206.85	40	3.32	0.19
Lack of control over work pace	244.37	247	221.86	180	224.63	40	3.28	0.19
Lack of control over work method	242.11	247	225.11	180	223.95	40	2.08	0.35
Harassment	226.46	247	237.20	180	266.13	40	3.84	0.15
Conflicts	230.51	247	237.87	180	238.10	40	0.37	0.83
Tension	233.95	247	233.01	180	238.78	40	0.06	0.97

The post hoc analysis revealed statistically significant differences in:

- overtime scores between health workers who hold university degrees (249.66) and health workers who hold higher school degrees (215.19) (p = 0.02) (Figure 10),



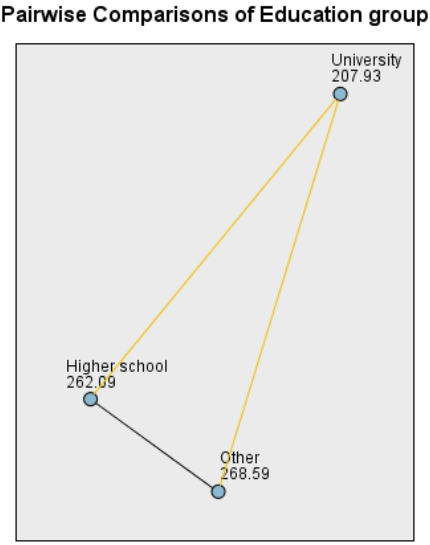
Sample1-Sample2	Test Statistic	Std. Error	Std. Test Statistic	Sig.	Adj.Sig.
Higher school-Other	-6.756	22.378	-.302	.763	1.000
Higher school-University	34.461	12.546	2.747	.006	.018
Other-University	27.706	21.819	1.270	.204	.612

Each row tests the null hypothesis that the Sample 1 and Sample 2 distributions are the same.
Asymptotic significances (2-sided tests) are displayed. The significance level is .05.

Figure 10. Differences in overtime scores among education groups

- unclear role scores between health workers who hold university degrees (207.93) and health workers who hold higher school degrees

(262.09) ($p < 0.01$), and between health workers who hold university degrees and health workers who hold other degrees (268.59) ($p = 0.02$) (Figure 11),

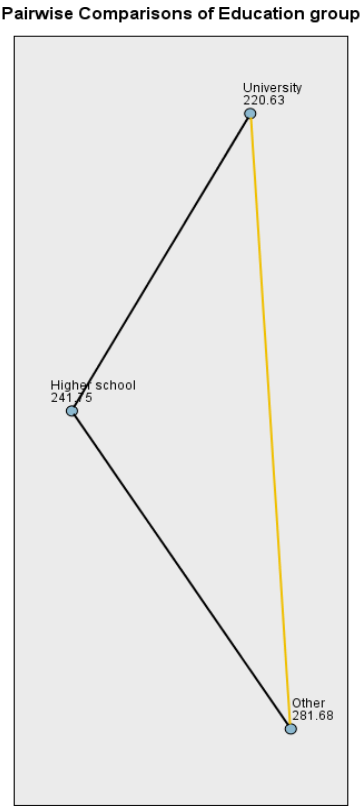


Sample1-Sample2	Test Statistic	Std. Error	Std. Test Statistic	Sig.	Adj.Sig.
University-Higher school	-54.169	12.713	-4.261	.000	.000
University-Other	-60.662	22.110	-2.744	.006	.018
Higher school-Other	-6.493	22.676	-.286	.775	1.000

Each row tests the null hypothesis that the Sample 1 and Sample 2 distributions are the same.
Asymptotic significances (2-sided tests) are displayed. The significance level is .05.

Figure 11. Differences in unclear role scores among education groups

- conflicting roles scores between health workers who hold other degrees (281.68) and health workers who hold university degrees (220.63) ($p = 0.02$) (Figure 12),



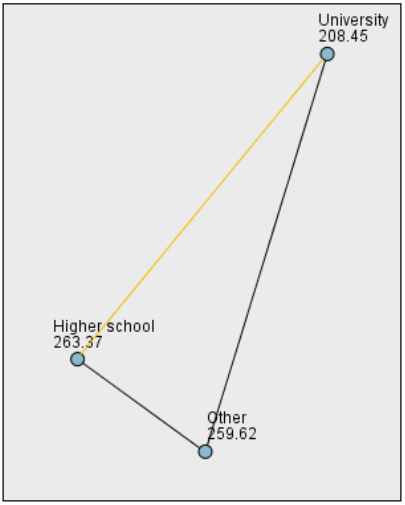
Sample1-Sample2	Test Statistic	Std. Error	Std. Test Statistic	Sig.	Adj.Sig.
University-Higher school	-21.123	12.796	-1.651	.099	.296
University-Other	-61.045	22.254	-2.743	.006	.018
Higher school-Other	-39.922	22.824	-1.749	.080	.241

Each row tests the null hypothesis that the Sample 1 and Sample 2 distributions are the same.
Asymptotic significances (2-sided tests) are displayed. The significance level is .05.

Figure 12. Differences in conflicting roles scores among education groups

- being under-skilled for a job scores between health workers who hold higher school degrees (263.37) and health workers who hold university degrees (208.45) ($p < 0.01$) (Figure 13).

Pairwise Comparisons of Education group



Each node shows the sample average rank of Education group.

Sample1-Sample2	Test Statistic	Std. Error	Std. Test Statistic	Sig.	Adj.Sig.
University-Other	-51.180	22.192	-2.306	.021	.063
University-Higher school	-54.927	12.760	-4.304	.000	.000
Other-Higher school	3.747	22.760	.165	.869	1.000

Each row tests the null hypothesis that the Sample 1 and Sample 2 distributions are the same.
Asymptotic significances (2-sided tests) are displayed. The significance level is .05.

Figure 13. Differences in being under-skilled scores among education groups

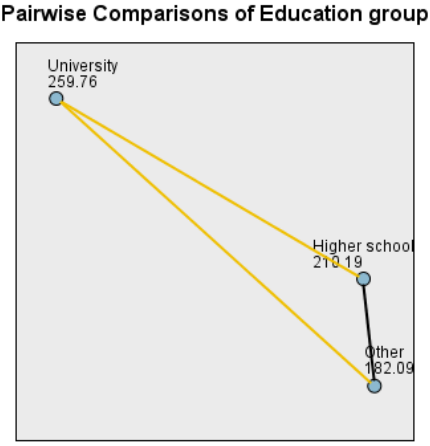
Five organizational intervention objects (work-life balance, $\chi 2$ (2) = 7.44, p = 0.02; variety of tasks, $\chi 2$ (2) = 21.42, p < 0.01; communication, $\chi 2$ (2) = 9.80, p < 0.01; manager feedback, $\chi 2$ (2) = 10.95, p < 0.01; stress management training, χ 2 (2) = 17.49, p < 0.01) had mean rank scores differing statistically significant across education groups (Table 19).

Table 19. Organizational intervention objects and education group results of the Kruskal–Wallis test

Variables	University		Higher school		Other		$\chi^2(2)$	*p*
	Mean rank	*N*	Mean rank	*N*	Mean rank	*N*		
Work-life balance	223.88	247	253.88	180	207.00	40	7.44	0.02
Skills/abilities matching to the job demands	229.74	247	239.09	180	237.40	40	0.59	0.74
Variety of tasks	259.76	247	210.19	180	182.09	40	21.42	<0.01
Social support	226.35	247	238.62	180	260.44	40	2.56	0.28
Organizational support	229.88	247	235.19	180	254.09	40	1.14	0.56
Participation in decision-making	224.28	247	239.38	180	269.85	40	4.45	0.11
Communication	217.23	247	247.41	180	277.24	40	9.80	<0.01
Justice of reward	233.40	247	229.30	180	258.84	40	1.61	0.45
Manager feedback	227.04	247	228.60	180	301.30	40	10.95	<0.01
Stress management training	211.19	247	254.09	180	284.45	40	17.49	<0.01

The post hoc analysis revealed statistically significant differences in:

- variety of tasks scores between health workers who hold university degrees (259.76) and health workers who hold higher school degrees (210.19) ($p < 0,01$), and between health workers who hold university degrees and health workers who hold other degrees (182.09) ($p < 0.01$) (Figure 14),

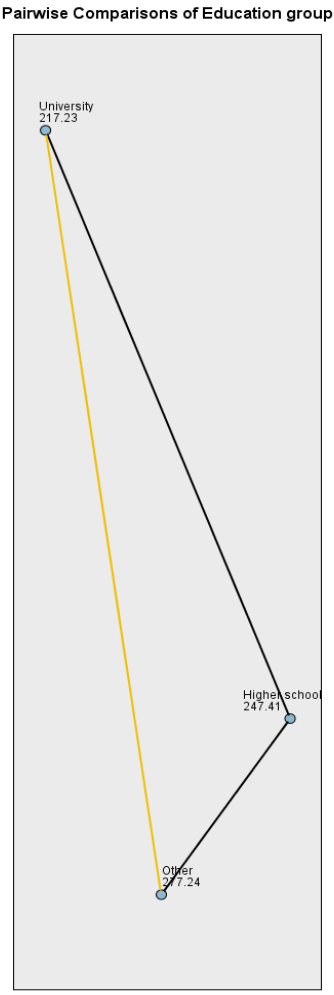


Sample1-Sample2	Test Statistic	Std. Error	Std. Test Statistic	Sig.	Adj.Sig.
Other-Higher school	28.104	23.090	1.217	.224	.671
Other-University	77.670	22.514	3.450	.001	.002
Higher school-University	49.565	12.945	3.829	.000	.000

Each row tests the null hypothesis that the Sample 1 and Sample 2 distributions are the same.
Asymptotic significances (2-sided tests) are displayed. The significance level is .05.

Figure 14. Differences in variety of tasks scores among education groups

- communication scores between health workers who hold other degrees (277.24) and health workers who hold university degrees (217.23) ($p = 0.03$) (Figure 15),



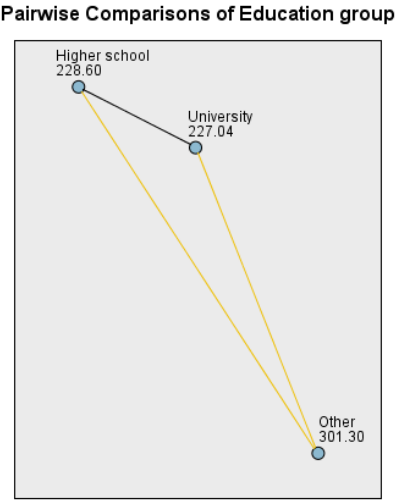
Each node shows the sample average rank of Education group.

Sample1-Sample2	Test Statistic	Std. Error	Std. Test Statistic	Sig.	Adj.Sig.
University-Higher school	-30.177	13.153	-2.294	.022	.065
University-Other	-60.009	22.875	-2.623	.009	.026
Higher school-Other	-29.832	23.461	-1.272	.204	.611

Each row tests the null hypothesis that the Sample 1 and Sample 2 distributions are the same.
Asymptotic significances (2-sided tests) are displayed. The significance level is .05.

Figure 15. Differences in communication scores among education groups

- manager feedback scores between health workers who hold other degrees (301.30) and health workers who hold university degrees (227.04) ($p < 0.01$), and between health workers who hold other degrees and health workers who hold higher school degrees (228.60) ($p < 0.01$) (Figure 16),



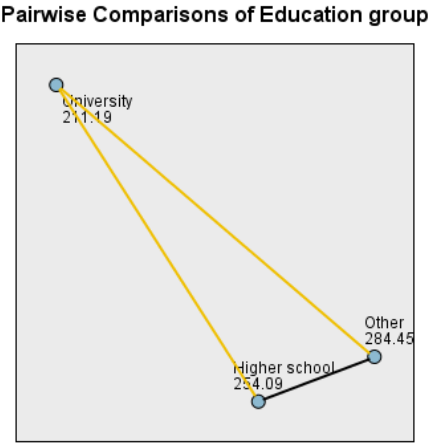
Each node shows the sample average rank of Education group.

Sample1-Sample2	Test Statistic	Std. Error	Std. Test Statistic	Sig.	Adj.Sig.
University-Higher school	-1.559	13.190	-.118	.906	1.000
University-Other	-74.262	22.940	-3.237	.001	.004
Higher school-Other	-72.703	23.527	-3.090	.002	.006

Each row tests the null hypothesis that the Sample 1 and Sample 2 distributions are the same.
Asymptotic significances (2-sided tests) are displayed. The significance level is .05.

Figure 16. Differences in manager feedback scores among education groups

- stress management training scores between health workers who hold university degrees (211.19) and health workers who hold higher school degrees (254.09) ($p < 0.01$), and between health workers who hold university degrees and health workers who hold other degrees (284.45) ($p < 0.01$) (Figure 17).



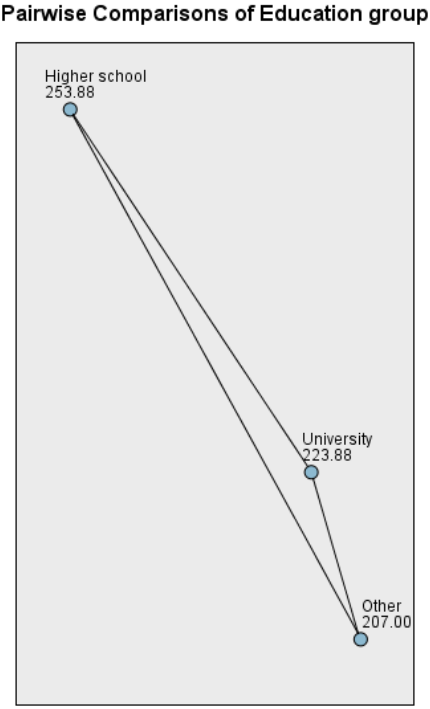
Each node shows the sample average rank of Education group.

Sample1-Sample2	Test Statistic	Std. Error	Std. Test Statistic	Sig.	Adj.Sig.
University-Higher school	-42.908	12.900	-3.326	.001	.003
University-Other	-73.264	22.436	-3.266	.001	.003
Higher school-Other	-30.356	23.010	-1.319	.187	.561

Each row tests the null hypothesis that the Sample 1 and Sample 2 distributions are the same.
Asymptotic significances (2-sided tests) are displayed. The significance level is .05.

Figure 17. Differences in stress management training scores among education groups

The post hoc analysis revealed no statistically significant differences in work-life balance scores among education groups (Figure 18).



Sample1-Sample2	Test Statistic	Std. Error	Std. Test Statistic	Sig.	Adj.Sig.
Other-University	16.883	22.148	.762	.446	1.000
Other-Higher school	46.883	22.716	2.064	.039	.117
University-Higher school	-30.001	12.735	-2.356	.018	.055

Each row tests the null hypothesis that the Sample 1 and Sample 2 distributions are the same.
Asymptotic significances (2-sided tests) are displayed. The significance level is .05.

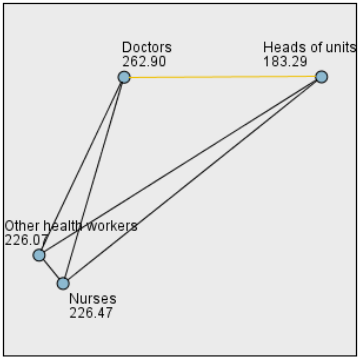
Figure 18. Differences in work-life balance scores among education groups

Occupation. Table 20 shows that there were statistically significant differences across the four occupational groups of respondents with respect to stress at work, $\chi 2(3) = 12.14$, $p < 0.01$.

Table 20. Stress at work and occupation results of the Kruskal–Wallis test

Groups	*N*	Mean rank	$\chi^2(3)$	*p*
Heads of units	29	183.29	12.14	<0.01
Doctors	132	262.90		
Nurses	205	226.47		
Other health workers	101	226.07		

The post hoc analysis revealed statistically significant differences in work-related stress scores between doctors (262.90) and heads of units (183.29) (p = 0.02) (Figure 19).



Sample1-Sample2	Test Statistic	Std. Error	Std. Test Statistic	Sig.	Adj.Sig.
Heads of units-Other health workers	-42.781	27.233	-1.571	.116	.697
Heads of units-Nurses	-43.175	25.646	-1.684	.092	.554
Heads of units-Doctors	-79.608	26.510	-3.003	.003	.016
Other health workers-Nurses	.394	15.715	.025	.980	1.000
Other health workers-Doctors	36.827	17.089	2.155	.031	.187
Nurses-Doctors	36.433	14.426	2.526	.012	.069

Each row tests the null hypothesis that the Sample 1 and Sample 2 distributions are the same.
Asymptotic significances (2-sided tests) are displayed. The significance level is .05.

Figure 19. Differences in work-related stress scores among occupational groups

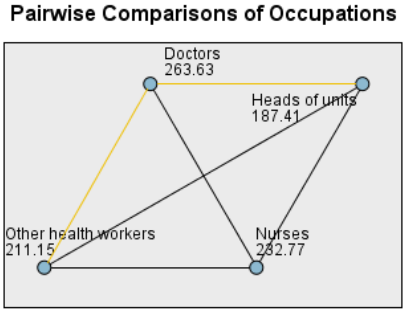
Six psychosocial risk determinants (work overload, $\chi 2(3) = 13.41$, $p < 0.01$; overtime $\chi 2(3) = 14.23$, $p < 0.01$; tight deadlines $\chi 2(3) = 8{,}64$, $p = 0.03$; unclear role, $\chi 2(3) = 15.24$, $p < 0.01$; being under-skilled $\chi 2(3) = 10.30$, $p = 0.02$; responsibility $\chi 2(3) = 13.66$, $p < 0.01$) had mean rank scores differing statistically significant across occupational groups (Table 21).

Table 21. Psychosocial risk determinants and occupational group results of the Kruskal–Wallis test

Variables	Heads of the units		Doctors		Nurses		Other		$\chi^2(3)$	*p*
	Mean rank	*N*	Mean rank	*N*	Mean rank	*N*	Mean rank	*N*		
Hazardous working conditions	169.83	29	235.16	132	236.41	205	246.01	101	7.79	0.05
Work overload	187.41	29	263.63	132	232.77	205	211.15	101	13.41	<0.01
Excessive work pace	230.62	29	242.72	132	232.08	205	227.47	101	1.03	0.79
Overtime	245.28	29	263.42	132	229.85	205	200.73	101	14.23	<0.01
Tight deadlines	212.28	29	257.47	132	233.84	205	209.89	101	8.64	0.03
Unclear role	152.5	29	226.68	132	239.14	205	256.53	101	15.24	<0.01
Conflicting roles	219.72	29	224.91	132	228.67	205	260.80	101	5.58	0.13
Being under-skilled for a job	193.55	29	212.52	132	251.81	205	237.53	101	10.30	0.02
Responsibility for decision-making and actions	282.62	29	252.87	132	230.21	205	203.07	101	13.66	<0.01
Lack of control over work pace	211.07	29	243.61	132	241.97	205	211.85	101	5.22	0.16
Lack of control over work method	252.97	29	234.89	132	240.40	205	214.41	101	3.48	0.32
Harassment	200.97	29	231.59	132	238.73	205	237.02	101	2.55	0.47
Conflicts	222.72	29	220.33	132	249.84	205	222.95	101	5.39	0.14
Tension	207.55	29	222.98	132	246.24	205	231.16	101	4.03	0.26

The post hoc analysis revealed statistically significant differences in:

- work overload scores between doctors (263.63) and heads of the units (187.41) ($p = 0.028$), and between doctors and other health workers (211.15) ($p = 0.02$) (Figure 20),



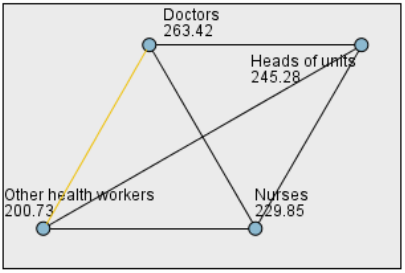
Sample1-Sample2	Test Statistic	Std. Error	Std. Test Statistic	Sig.	Adj.Sig.
Heads of units-Other health workers	-23.740	27.703	-.857	.391	1.000
Heads of units-Nurses	-45.354	26.089	-1.738	.082	.493
Heads of units-Doctors	-76.215	26.968	-2.826	.005	.028
Other health workers-Nurses	21.615	15.986	1.352	.176	1.000
Other health workers-Doctors	52.475	17.384	3.019	.003	.015
Nurses-Doctors	30.860	14.675	2.103	.035	.213

Each row tests the null hypothesis that the Sample 1 and Sample 2 distributions are the same.
Asymptotic significances (2-sided tests) are displayed. The significance level is .05.

Figure 20. Differences in work overload scores among occupational groups

- overtime scores between doctors (263.42) and other health workers (200.73) ($p < 0.01$) (Figure 21),

Pairwise Comparisons of Occupations



Each node shows the sample average rank of Occupations.

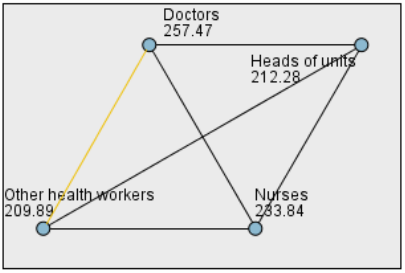
Sample1-Sample2	Test Statistic	Std. Error	Std. Test Statistic	Sig.	Adj.Sig.
Other health workers-Nurses	29.121	15.563	1.871	.061	.368
Other health workers-Heads of units	44.543	26.971	1.652	.099	.592
Other health workers-Doctors	62.684	16.924	3.704	.000	.001
Nurses-Heads of units	15.422	25.399	.607	.544	1.000
Nurses-Doctors	33.563	14.287	2.349	.019	.113
Heads of units-Doctors	-18.141	26.255	-.691	.490	1.000

Each row tests the null hypothesis that the Sample 1 and Sample 2 distributions are the same.
Asymptotic significances (2-sided tests) are displayed. The significance level is .05.

Figure 21. Differences in overtime scores among occupational groups

- tight deadlines scores between doctors (257.47) and other health workers (209.89) (p = 0.03) (Figure 22),

Pairwise Comparisons of Occupations



Each node shows the sample average rank of Occupations.

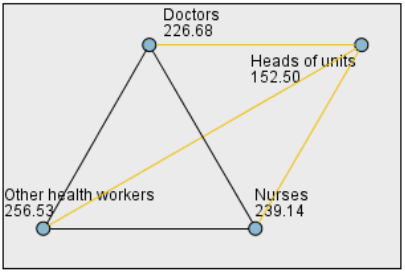
Sample1-Sample2	Test Statistic	Std. Error	Std. Test Statistic	Sig.	Adj.Sig.
Other health workers-Heads of units	2.390	27.306	.088	.930	1.000
Other health workers-Nurses	23.955	15.757	1.520	.128	.771
Other health workers-Doctors	47.584	17.135	2.777	.005	.033
Heads of units-Nurses	-21.566	25.714	-.839	.402	1.000
Heads of units-Doctors	-45.194	26.581	-1.700	.089	.535
Nurses-Doctors	23.628	14.464	1.634	.102	.614

Each row tests the null hypothesis that the Sample 1 and Sample 2 distributions are the same.
Asymptotic significances (2-sided tests) are displayed. The significance level is .05.

Figure 22. Differences in tight deadlines scores among occupational groups

- unclear role scores between heads of the units (152.50) and doctors (226.68) ($p = 0.03$), heads of the units and nurses (239.14) ($p < 0.01$), and heads of the units and other health workers (256.53) ($p < 0.01$) (Figure 23),

Pairwise Comparisons of Occupations



Each node shows the sample average rank of Occupations.

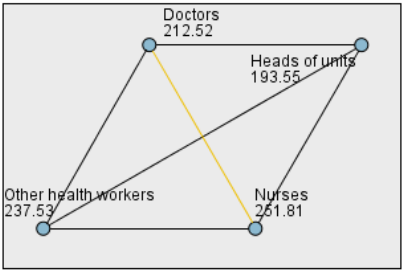
Sample1-Sample2	Test Statistic	Std. Error	Std. Test Statistic	Sig.	Adj.Sig.
Heads of units-Doctors	-74.178	26.604	-2.788	.005	.032
Heads of units-Nurses	-86.644	25.737	-3.367	.001	.005
Heads of units-Other health workers	-104.030	27.330	-3.806	.000	.001
Doctors-Nurses	-12.466	14.477	-.861	.389	1.000
Doctors-Other health workers	-29.852	17.150	-1.741	.082	.490
Nurses-Other health workers	-17.386	15.771	-1.102	.270	1.000

Each row tests the null hypothesis that the Sample 1 and Sample 2 distributions are the same.
Asymptotic significances (2-sided tests) are displayed. The significance level is .05.

Figure 23. Differences in unclear role scores among occupational groups

- being under-skilled scores between doctors (212.52) and nurses (251.81) ($p = 0.04$) (Figure 24),

Pairwise Comparisons of Occupations



Each node shows the sample average rank of Occupations.

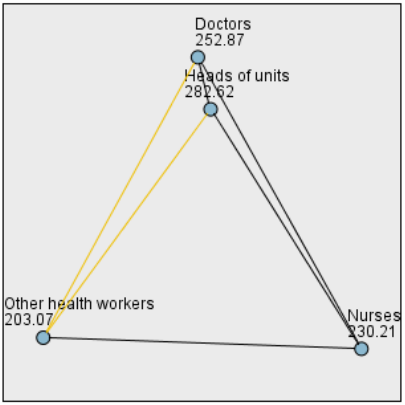
Sample1-Sample2	Test Statistic	Std. Error	Std. Test Statistic	Sig.	Adj.Sig.
Heads of units-Doctors	-18.971	26.703	-.710	.477	1.000
Heads of units-Other health workers	-43.978	27.431	-1.603	.109	.653
Heads of units-Nurses	-58.260	25.833	-2.255	.024	.145
Doctors-Other health workers	-25.007	17.213	-1.453	.146	.878
Doctors-Nurses	-39.289	14.531	-2.704	.007	.041
Other health workers-Nurses	14.282	15.829	.902	.367	1.000

Each row tests the null hypothesis that the Sample 1 and Sample 2 distributions are the same.
Asymptotic significances (2-sided tests) are displayed. The significance level is .05.

Figure 24. Differences in being under-skilled scores among occupational groups

- responsibility scores between other health workers (203.07) and doctors (252.87) ($p = 0.02$), and other health workers and heads of the units (282.62) ($p = 0.02$) (Figure 25).

Pairwise Comparisons of Occupations



Each node shows the sample average rank of Occupations.

Sample1-Sample2	Test Statistic	Std. Error	Std. Test Statistic	Sig.	Adj.Sig.
Other health workers-Nurses	27.143	15.256	1.779	.075	.451
Other health workers-Doctors	49.798	16.590	3.002	.003	.016
Other health workers-Heads of units	79.551	26.438	3.009	.003	.016
Nurses-Doctors	22.655	14.005	1.618	.106	.634
Nurses-Heads of units	52.408	24.897	2.105	.035	.212
Doctors-Heads of units	29.753	25.736	1.156	.248	1.000

Each row tests the null hypothesis that the Sample 1 and Sample 2 distributions are the same.
Asymptotic significances (2-sided tests) are displayed. The significance level is .05.

Figure 25. Differences in responsibility scores among occupational groups

All organizational intervention objects (except stress management training) had mean rank scores differing statistically significant across occupational groups: work-life balance, $\chi2(3) = 13.19$, $p < 0.01$; skills/abilities matching to the job demands, $\chi2(3) = 15.29$, $p < 0.01$; variety of tasks, $\chi2(3) = 51.06$, $p < 0.01$; social support, $\chi2(3) = 9.33$,

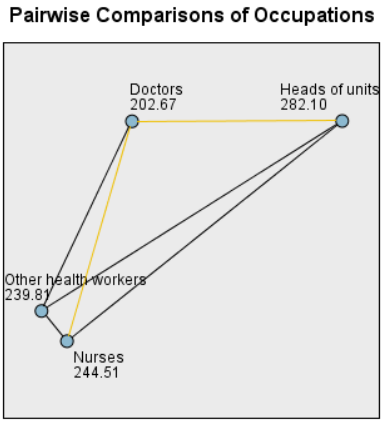
p = 0.02; organizational support, $\chi 2(3) = 17.88$, $p < 0.01$; participation in decision-making, $\chi 2(3) = 8.08$, $p = 0.04$; communication, $\chi 2(3) = 10.10$, $p = 0.02$; justice of reward, $\chi 2(3) = 14.70$, $p < 0.01$; manager feedback, $\chi 2(3) = 15.65$, $p < 0.01$ (Table 22).

Table 22. Organizational intervention objects and occupational group results of the Kruskal–Wallis test

Variables	Heads of the units		Doctors		Nurses		Other		$\chi^2(3)$	p
	Mean rank	*N*	Mean rank	*N*	Mean rank	*N*	Mean rank	*N*		
Work-life balance	282.10	29	202.67	132	244.51	205	239.81	101	13.19	<0.01
Skills/abilities matching to the job demands	295.91	29	240.48	132	238.66	205	198.30	101	15.29	<0.01
Variety of tasks	315.43	29	264.57	132	239.76	205	158.98	101	51.06	<0.01
Social support	295.64	29	213.57	132	236.10	205	238.73	101	9.33	0.02
Organizational support	332.00	29	218.53	132	235.45	205	223.12	101	17.88	<0.01
Participation in decision-making	295.64	29	217.84	132	235.33	205	234.72	101	8.08	0.04
Communication	270.62	29	204.50	132	241.47	205	246.87	101	10.10	0.02
Justice of reward	292.10	29	207.33	132	230.25	205	259.78	101	14.70	<0.01
Manager feedback	308.00	29	215.63	132	223.57	205	257.94	101	15.65	<0.01
Stress management training	235.90	29	214.92	132	244.20	205	237.68	101	4,09	0.25

The post hoc analysis revealed statistically significant differences in:

- work-life balance scores between doctors (202.67) and heads of the units (282.10) (p = 0.02), and between doctors and nurses (244.51) (p = 0.02) (Figure 26),



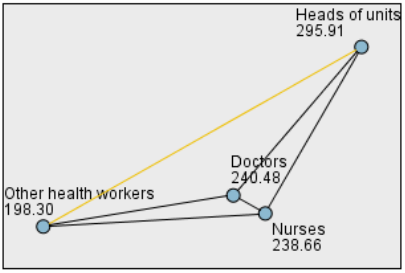
Sample1-Sample2	Test Statistic	Std. Error	Std. Test Statistic	Sig.	Adj.Sig.
Doctors-Other health workers	-37.145	17.179	-2.162	.031	.184
Doctors-Nurses	-41.841	14.502	-2.885	.004	.023
Doctors-Heads of units	79.437	26.651	2.981	.003	.017
Other health workers-Nurses	4.695	15.798	.297	.766	1.000
Other health workers-Heads of units	42.292	27.377	1.545	.122	.734
Nurses-Heads of units	37.596	25.782	1.458	.145	.869

Each row tests the null hypothesis that the Sample 1 and Sample 2 distributions are the same.
Asymptotic significances (2-sided tests) are displayed. The significance level is .05.

Figure 26. Differences in work-life balance scores among occupational groups

- skills/abilities matching to the job demands scores between heads of the units (295.91) and other health workers (198.30) (p = 0.002) (Figure 27),

Pairwise Comparisons of Occupations



Each node shows the sample average rank of Occupations.

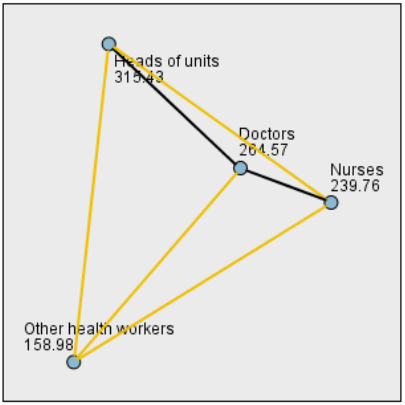
Sample1-Sample2	Test Statistic	Std. Error	Std. Test Statistic	Sig.	Adj.Sig.
Other health workers-Nurses	40.359	15.544	2.596	.009	.057
Other health workers-Doctors	42.188	16.903	2.496	.013	.075
Other health workers-Heads of units	97.617	26.937	3.624	.000	.002
Nurses-Doctors	1.829	14.269	.128	.898	1.000
Nurses-Heads of units	57.258	25.367	2.257	.024	.144
Doctors-Heads of units	55.429	26.222	2.114	.035	.207

Each row tests the null hypothesis that the Sample 1 and Sample 2 distributions are the same.
Asymptotic significances (2-sided tests) are displayed. The significance level is .05.

Figure 27. Differences in skills/abilities matching to the job demands scores among occupational groups

- variety of tasks scores between other health workers (158.98) and doctors (264.57) ($p < 0.01$), between other health workers and heads of the units (315.43) ($p < 0.01$), and between other health workers and nurses (239.76) ($p < 0.01$); between heads of the units and nurses ($p = 0.02$) (Figure 28),

Pairwise Comparisons of Occupations



Each node shows the sample average rank of Occupations.

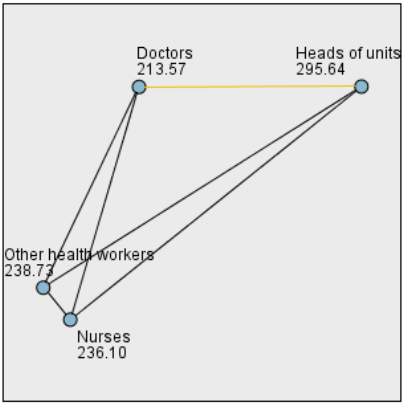
Sample1-Sample2	Test Statistic	Std. Error	Std. Test Statistic	Sig.	Adj.Sig.
Other health workers-Nurses	80.778	16.059	5.030	.000	.000
Other health workers-Doctors	105.588	17.463	6.046	.000	.000
Other health workers-Heads of units	156.451	27.829	5.622	.000	.000
Nurses-Doctors	24.810	14.741	1.683	.092	.554
Nurses-Heads of units	75.672	26.207	2.888	.004	.023
Doctors-Heads of units	50.863	27.090	1.878	.060	.363

Each row tests the null hypothesis that the Sample 1 and Sample 2 distributions are the same.
Asymptotic significances (2-sided tests) are displayed. The significance level is .05.

Figure 28. Differences in variety of tasks scores among occupational groups

- social support scores between doctors (213.57) and heads of the units (295.64) (p = 0.02) (Figure 29),

Pairwise Comparisons of Occupations



Each node shows the sample average rank of Occupations.

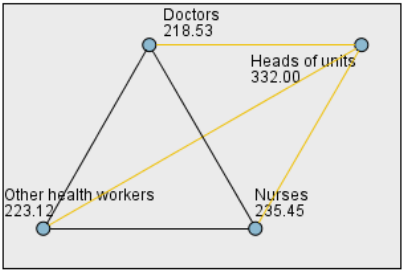
Sample1-Sample2	Test Statistic	Std. Error	Std. Test Statistic	Sig.	Adj.Sig.
Doctors-Nurses	-22.537	14.999	-1.503	.133	.798
Doctors-Other health workers	-25.164	17.768	-1.416	.157	.940
Doctors-Heads of units	82.070	27.563	2.978	.003	.017
Nurses-Other health workers	-2.628	16.339	-.161	.872	1.000
Nurses-Heads of units	59.533	26.665	2.233	.026	.153
Other health workers-Heads of units	56.905	28.315	2.010	.044	.267

Each row tests the null hypothesis that the Sample 1 and Sample 2 distributions are the same.
Asymptotic significances (2-sided tests) are displayed. The significance level is .05.

Figure 29. Differences in social support scores among occupational groups

- organizational support scores between heads of the units (332.00) and doctors (218.53) ($p < 0.01$), between heads of the units and nurses (235.45) ($p < 0.01$), and between heads of the units and other health workers (223.12) ($p < 0.01$) (Figure 30),

Pairwise Comparisons of Occupations



Each node shows the sample average rank of Occupations.

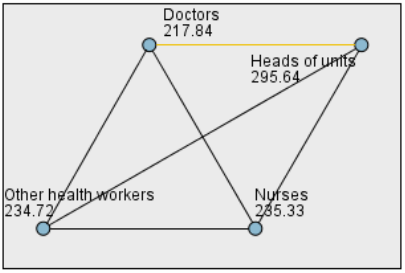
Sample1-Sample2	Test Statistic	Std. Error	Std. Test Statistic	Sig.	Adj.Sig.
Doctors-Other health workers	-4.590	17.755	-.259	.796	1.000
Doctors-Nurses	-16.920	14.988	-1.129	.259	1.000
Doctors-Heads of units	113.466	27.543	4.120	.000	.000
Other health workers-Nurses	12.330	16.327	.755	.450	1.000
Other health workers-Heads of units	108.876	28.294	3.848	.000	.001
Nurses-Heads of units	96.546	26.645	3.623	.000	.002

Each row tests the null hypothesis that the Sample 1 and Sample 2 distributions are the same.
Asymptotic significances (2-sided tests) are displayed. The significance level is .05.

Figure 30. Differences in organizational support scores among occupational groups

- participation in decision-making scores between heads of the units (295.64) and doctors (217.84) ($p = 0.03$) (Figure 31),

Pairwise Comparisons of Occupations



Each node shows the sample average rank of Occupations.

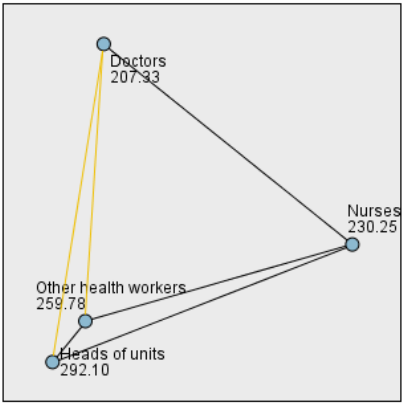
Sample1-Sample2	Test Statistic	Std. Error	Std. Test Statistic	Sig.	Adj.Sig.
Doctors-Other health workers	-16.881	17.712	-.953	.341	1.000
Doctors-Nurses	-17.497	14.952	-1.170	.242	1.000
Doctors-Heads of units	77.801	27.477	2.831	.005	.028
Other health workers-Nurses	.616	16.288	.038	.970	1.000
Other health workers-Heads of units	60.920	28.226	2.158	.031	.185
Nurses-Heads of units	60.304	26.581	2.269	.023	.140

Each row tests the null hypothesis that the Sample 1 and Sample 2 distributions are the same.
Asymptotic significances (2-sided tests) are displayed. The significance level is .05.

Figure 31. Differences in participation in decision-making scores among occupational groups

- justice of reward scores between doctors (207.33) and heads of the units (292.10) (p = 0.01), and between doctors and other health workers (259.78) (p = 0.02) (Figure 32),

Pairwise Comparisons of Occupations



Each node shows the sample average rank of Occupations.

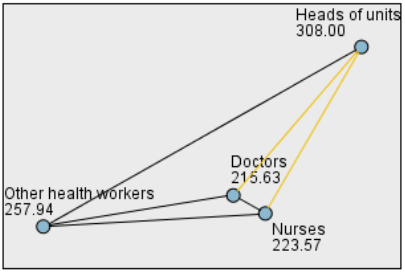
Sample1-Sample2	Test Statistic	Std. Error	Std. Test Statistic	Sig.	Adj.Sig.
Doctors-Nurses	-22.915	14.892	-1.539	.124	.743
Doctors-Other health workers	-52.449	17.642	-2.973	.003	.018
Doctors-Heads of units	84.770	27.368	3.097	.002	.012
Nurses-Other health workers	-29.533	16.223	-1.820	.069	.412
Nurses-Heads of units	61.855	26.476	2.336	.019	.117
Other health workers-Heads of units	32.321	28.114	1.150	.250	1.000

Each row tests the null hypothesis that the Sample 1 and Sample 2 distributions are the same.
Asymptotic significances (2-sided tests) are displayed. The significance level is .05.

Figure 32. Differences in justice of reward scores among occupational groups

- manager feedback scores between heads of the units (308.00) and doctors (215.63) ($p < 0.01$), and between heads of the units and nurses (223.57) ($p < 0.01$) (Figure 33).

Pairwise Comparisons of Occupations



Each node shows the sample average rank of Occupations.

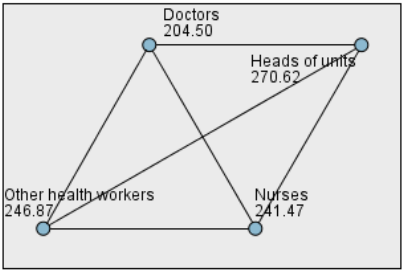
Sample1-Sample2	Test Statistic	Std. Error	Std. Test Statistic	Sig.	Adj.Sig.
Doctors-Nurses	-7.937	15.020	-.528	.597	1.000
Doctors-Other health workers	-42.312	17.793	-2.378	.017	.104
Doctors-Heads of units	92.371	27.603	3.346	.001	.005
Nurses-Other health workers	-34.375	16.363	-2.101	.036	.214
Nurses-Heads of units	84.434	26.703	3.162	.002	.009
Other health workers-Heads of units	50.059	28.356	1.765	.077	.465

Each row tests the null hypothesis that the Sample 1 and Sample 2 distributions are the same.
Asymptotic significances (2-sided tests) are displayed. The significance level is .05.

Figure 33. Differences in manager feedback scores among occupational groups

The post hoc analysis revealed no statistically significant differences in communication scores across occupational groups (Figure 34).

Pairwise Comparisons of Occupations



Each node shows the sample average rank of Occupations.

Sample1-Sample2	Test Statistic	Std. Error	Std. Test Statistic	Sig.	Adj.Sig.
Doctors-Nurses	-36.969	14.978	-2.468	.014	.081
Doctors-Other health workers	-42.363	17.743	-2.388	.017	.102
Doctors-Heads of units	66.117	27.525	2.402	.016	.098
Nurses-Other health workers	-5.393	16.317	-.331	.741	1.000
Nurses-Heads of units	29.148	26.628	1.095	.274	1.000
Other health workers-Heads of units	23.754	28.276	.840	.401	1.000

Each row tests the null hypothesis that the Sample 1 and Sample 2 distributions are the same.
Asymptotic significances (2-sided tests) are displayed. The significance level is .05.

Figure 34. Differences in communication scores among occupational groups

4. DISCUSSION

This study aimed to determine health workers' attitudes towards psychosocial risk determinants, organizational intervention objects, and the level of stress in their primary healthcare institution, considering the sociodemographic characteristics of medical staff and the context of the institution. For that purpose, the psychosocial work environment diagnostic model was developed and empirically tested. Thus, a two-step diagnosis of the psychosocial work environment was performed: at the level of the institution and at the level of health workers.

First step of diagnosis (the institution level). Looking at the common fourteen psychosocial risk determinants and ten organizational intervention objects assessed in the primary healthcare institution, it is clear that the organizational context conditions the predominant psychosocial risk determinants and the health workers' attitude towards the organizational intervention objects.

The research was conducted in February-March, when medical staff face additional workload due to the outbreak of influenza and other infections. Thus, the respondents' stress level results reflect the natural situation in the healthcare institution – about half of respondents (47%) always or often experienced stress. Regarding the psychosocial risk determinants, the most frequently reported determinant was responsibility (78.2% of respondents), followed by excessive work pace (52.4%) and hazardous working conditions (39.6%). In healthcare institutions, one of the main sources of stress is responsibility for other people, their safety and health [11]. Health workers have to make ongoing decisions to ensure patients' health or save their lives. An excessive work pace is the second most common psychosocial risk determinant in the public service sector, where human resources are often seen as a source of expenditure rather than a strategic capital of the system: work-related bureaucracy, workload, staff shortages, high customer / patient expectations for speed of service and quality [12; 13]. The third determinant – hazardous

working conditions – is a common problem of the healthcare sector in the European Union, leading to accidents at work, occupational diseases, absenteeism, staff turnover, early retirement and staff shortages [14]. Health workers may be exposed to a very wide variety of risks: biological, chemical, and physical hazards, ergonomic factors, organizational problems, and psychosocial hazards [15].

Concerning organizational intervention objects, respondents were mostly satisfied with the institution's efforts to ensure that their qualifications and skills met their job requirements (71.3%) and least satisfied with justice of reward (19.5%) and organizational support (7.1%). It can be due to a complex system of remuneration regulation and limited opportunities for incentives in the Lithuanian public healthcare sector. First of all, there is the collective agreement of the Lithuanian national health systems sector [16]. The agreement lays down basic provisions on wage, safety and other working conditions, holidays, and social guarantees for health workers of public health settings. For example, it states that wages, bonuses, compensations, and employee promotions shall be determined by a public healthcare institution agreement in compliance with national laws and regulations. In fact, health workers' salary depends on the time worked, the amount and complexity of the work, the scale of work, the relevant profession or professional qualification, job seniority, the employee's contribution to the results of their healthcare institution, the relevance of the profession to the institution etc. Secondly, Lithuanian legislation on the working and social conditions of health workers contains many details, criteria and reservations, which do not give the healthcare institutions very much freedom to motivate and reward workers for their efforts accordingly. Nevertheless, the healthcare institution should demonstrate a concern for their staff, provide staff with support to perform their jobs, and fulfill workers' socio-emotional needs, as this helps workers to cope with stressors and has a positive effect on worker satisfaction levels and job performance [17; 18; 19]. In addition, the institution should provide more stress management training. Only 30% of respondents believe that they are

getting enough stress management training. It does not require large investments but is effective enough in combination with primary-level interventions [20].

Second step of diagnosis (workers' level). The results confirmed that different sociodemographic groups of health workers emphasized different psychosocial risk determinants and organizational intervention objects. In reality, there was no statistically significant difference between the gender groups. Only one organizational intervention object, work-life balance, was more relevant to women than to men. This may be due to gender imbalances in the institution – as is the case in the whole healthcare sector. However, previous research findings provide contradictory information on gender differences in well-being at work [21].

Our research revealed that only an excessive work pace as a psychosocial risk determinant and the justice of reward and matching the demands of the job as organizational intervention objects differed statistically significant across age groups. The oldest group of health workers (> 50) emphasized an excessive work pace more than the youngest group of health workers (≤30). The younger group of health workers wanted their skills to better match the job demands compared to the oldest group of health workers, and the oldest group of health workers was more dissatisfied with justice of reward compared to the youngest group of health workers. However, other researchers have been cautious about age-related findings, because age might affect several components of the stress process at work; as these effects are partly conflicting, they might nullify each other in the overall relation between age and stress [22].

Regarding the job seniority group, results were similar to the age group, and this is consistent with other studies that found tenure had correlated positively with age [23; 24]. Once more, the excessive work pace had the greatest negative impact on health workers with the highest seniority (>10). Pairwise comparisons of job seniority groups showed that health workers who had worked in the institution for up to three years wanted to have their skills better match the job needs

than workers with the highest seniority, and workers with the highest seniority were more dissatisfied with justice of reward than health workers who had worked in the institution for up to five years. Health workers who had worked in the institution for three to five years were more willing to perform a variety of tasks than other job seniority groups. These findings are original, but it can be due to specific standards and regulations in the Lithuanian public primary healthcare sector [16].

Compared with other groups, educational and professional groups significantly differed in their approach to psychosocial risk determinants and organizational intervention objects.

Concerning psychosocial risk determinants and education, health workers who hold higher school degrees and other levels of education pointed out role stressors (role overload (being under-skilled), unclear role and conflicting roles), while workers who hold university degrees stressed overtime. This is in contrast to Marinaccio's findings [25] that showed that workers with the highest level of education perceived more role ambiguity and had skills that exceeded their job requirements. An interpretation may be that these results were influenced by the specificity of work at the public healthcare institution. Regarding organizational intervention objects, health workers who hold university degrees were less satisfied with stress management training and more satisfied with a variety of tasks than workers with other levels of education. A possible explanation for this might be that workers having little chance of formal promotion rely on building informal competence and local reputation [25; 26].

The results are in accordance with the studies indicating that occupation is the key factor that should be considered when managing psychosocial risks at organization [27; 28]. Work-related stress scores were statistically significant different only across occupational groups. Furthermore, more than half of the psychosocial risk determinants significantly differed due to occupational groups. The doctors' group was the most exposed to work-related stress. Doctors experienced stress mainly due to high job demands (workload, overtime, tight

deadlines, and responsibilities). In addition, doctors were dissatisfied with the institution's efforts to ensure work-life balance, social support, organizational support, involvement in decision-making, justice of reward. This group also indicated a lack of managerial feedback. In line with the literature, the findings confirm that the work of doctors in the public sector is busier and more stressful than the work of other occupations in a healthcare institution, which may lead to burnout and mental health problems [29; 30; 31].

Nurses and other health workers were more stressed by role stressors like role overload (being under-skilled for a job) and an unclear role. The results also confirm the findings of previous studies [32] and suggest that nurses and other health professionals face a conflict between their professional role expectations and work realities [33]. They also pointed out that organizational support did not fulfill their needs. Organizational support has a positive effect on workers' performance and plays an important role in terms of their loyalty to the organization [34]. Other health professionals also indicated a lack of variety of tasks, whereas the heads of units emphasized only responsibility as a psychosocial risk and had no priorities concerning organizational intervention objects. These findings are not surprising, as heads of units are responsible for unit performance and their work is largely administrative in nature.

In summary, the results showed that occupation (position) is the key sociodemographic characteristic that should be considered when managing psychosocial risks in a healthcare institution. Other sociodemographic groups such as gender, age, education, and job seniority should be considered, but with caution and only secondary in reliability, as studies were very controversial on how and whom they influence [21].

Nevertheless, this research also has limitations. First, the research is a cross-sectional study and cannot make conclusions regarding causality. Second, it did not include individual intervention objects that focus on helping individual employees to develop skills to manage, cope with, and reduce stress at work, whereas organization-

level interventions address the health and well-being of relatively large groups of workers in a uniform way [4]. Third, the small number of male workers in the sample may affect other subgroups of health workers (e.g., heads of units or some categories of job seniority), but this is the case for the whole EU healthcare sector [35]. Lastly, this research was performed in only one public primary healthcare institution; on the other hand, its safety and health policies for health workers are formed in accordance with the Lithuanian national health systems sector's collective agreement. Despite its limitations, this research provides some support for an integrated approach to the consideration of the organizational context and target groups in order to diagnose psychosocial risk determinants and to tailor organizational interventions to their specific needs at the institution. It supports participative problem-solving approaches because "employees are experts on their work and management of the work environment" [36].

5. CONCLUSIONS

1. Based on the findings of the research, the three predominant determinants out of fourteen psychosocial risk determinants and three intervention priorities out of ten organizational intervention objects at the institutional level were determined. The highest risk was responsibility for decision-making and actions (risk level over 60%), followed by the excessive work pace and hazardous working conditions (risk level between 30–60%). These determinants are very much relevant to the public healthcare sector: health workers face responsibility for patient safety and health, demands from other people for faster services, and various hazards (biological, chemical, ergonomic, organizational, psychosocial, etc.) in their daily work.

Concerning organizational intervention objects, health workers mostly pointed out the discrepancy between their efforts and the institution's rewards (justice of reward – 19.5%) and the need for workers' well-being improvement in the institution to better meet staff

expectations (organizational support – 17.1%). The third object that least met the expectations of medical staff was stress management training. Only 30% of respondents believe that they are getting enough stress management training. This is a problem of the Lithuanian public sector: a complex system of remuneration regulation and limited opportunities for incentives.

2. Different sociodemographic groups of health workers emphasized different psychosocial risk determinants and organizational intervention objects in the institution. Health workers over the age of 50 with more than 10 years of tenure were worried about the excessive pace of work and dissatisfied with the justice of reward, while younger workers with little work experience wanted their skills and abilities better matched to the job demands and a variety of tasks.

Nurses and other health workers who hold higher school degrees or other levels of education felt stressed about the risks related to their role in the institution (unclear role, conflict roles, role overload (being under-skilled)). They also wanted better manager feedback, a variety of tasks and organizational support. Doctors (university degree) mostly worried about risks related to high job demands (work overload, overtime, tight deadlines, responsibilities). They also highlighted poor social and organizational support, lack of participation in decision-making, lack of justice of reward, insufficient work-life balance, and insufficient manager feedback. Heads of units pointed out only one psychosocial risk determinant – responsibility. They were satisfied with the prevention related to almost all organizational intervention objects.

3. The results of work-related stress differed only across occupational groups. Compared to other occupational groups, doctors were the most exposed to work-related stress. In addition, most differences in the assessment of psychosocial risk determinants and organizational intervention objects were found in occupational groups compared to other sociodemographic groups.

4. The developed and empirically tested model of psychosocial work environment diagnosis allows to comprehensively assess the level of stress at work and to determine the predominant psychosocial risk determinants and the priority of intervention, considering the worker's sociodemographic characteristics and organizational context.

6. PRACTICAL RECOMMENDATIONS

Difficult working conditions, namely a poor psychosocial work environment, in the Lithuanian health system are frequently cited as a key driver behind the emigration of health workers. The research findings provide a structured process and practically support policymakers and institutional bodies in identifying the specific needs of existing strategies and national policies on the management of psychosocial risks and stress at work. First, policymakers should support to move practice above and beyond simple regulatory compliance and help develop the required level of expertise in the occupational health system. Therefore, the first question to be answered is what works for whom and in which circumstances; for example, the identification of homogeneous groups / occupational groups and their needs, instead of the traditional joint employee survey, could improve the development of stress management programs. Second, organizational justice, as an essential predictor of organizational success, should be given due emphasis in designing and implementing policies and strategies of human resource management in a healthcare institution. Organizational justice should include a component of distribution (e.g. the fair allocation of resources among workers), a procedural component (e.g. the extent to which decision-making procedures include input from workers, are consistently applied, non-bias, and are accurate and ethical), and a relational component (e.g. a polite, attentive, and fair treatment of workers). Third, healthcare institutions must become more adept at listening,

and responding, to the needs of the medical staff. They have to refocus systematically on a collaborative approach to identifying and controlling risks in the workplace, and on improving day-to-day management to better address existing and future occupational health and safety challenges. Everyone should be involved in promoting a good psychosocial work environment, which means that managers and health workers should be equipped to deal effectively with a difficult situation if it arises. The institutions should also understand the differential effects of different job characteristics on job outcomes, considering individual differences such as gender, age, job seniority, education, and occupation. Lastly, the research proposed a way to diagnose the psychosocial work environment in a public primary healthcare institution using a simple and robust tool. For future research, it is recommended that comparable studies be carried out in different types and ownerships of healthcare institutions and in different countries. In addition, the research can be an incentive for new theories in qualitative studies.

7. LIST OF SCIENTIFIC PUBLICATIONS AND PRESENTATIONS ON THE THEME OF THE DISSERTATION

Scientific publications

1. **Dudutienė D**, Juodaitė Račkauskienė A, Stukas R. Developing Stress Management Programs in a Public Primary Healthcare Institution: Should We Consider Health Workers' Sociodemographic Groups? Medicina. 2020; 56:162.

2. **Dudutienė D**, Juodaitė Račkauskienė A, Štaras K, Astrauskienė A, Stukas R. Diagnosis of Stress and Psychosocial Risk Determinants and the Prioritization of Organizational Intervention Objects among Medical Occupational Groups in a Public Health Care Institution. Visuomenės sveikata. 2020; 4(91): 45–51.

Scientific presentations

1. **Dudutienė D**, Juodaitė Račkauskienė A, Stukas R. Managing occupational stress: should we consider the sociodemographic groups of health workers? 16th World Congress on Public Health 2020. Roma, 2020.10.12-16.

2. **Dudutienė D**, Juodaitė Račkauskienė A, Stukas R. Diagnosis of psychosocial risk determinants and the prioritization of organizational intervention objects among medical occupational groups in a public healthcare institution. 1st International Electronic Conference on Medicine. Basel, 2021.06.20-30.

3. **Dudutienė D**, Juodaitė Račkauskienė A, Stukas R. Should an institution take care of mental health of health workers only during times of crisis? 22nd Congress of the European Anthropological Association. Vilnius (the presentation was accepted but the conference was postponed until 2022 because of the COVID-19).

REFERENCES

1. European Agency for Safety and Health at Work. Priorities for occupational safety and health research in Europe: 2013-2020. Luxembourg: Publications Office of the European Union, 2013.
2. Gustainienė L, Pranckevičienė A, Bukšnytė-Marmienė L, Genevičiūtė-Janonienė G. Darbuotojo gerovė ir pozityvi darbo aplinka: integruotas teorinis modelis. Organizacijų vadyba: sisteminiai tyrimai. 2014; 69:37–53.
3. Edwards D, Burnard P. A systematic review of stress and stress management interventions for mental health nurses. Journal of Advanced Nursing. 2003; 42(2):169–200.
4. Cox T, Taris TW, Nielsen K. Organizational interventions: Issues and challenges. Work Stress. 2010; 24:217-218.
5. Kompier MAJ, Cooper CL, Geurts SAE. A multiple case study approach to work stress prevention in Europe. Eur. J. Work Organ. Psychol. 2000; 9:371–400.
6. Scott T, Mannion R, Davies HTO, Marshall MN. Implementing culture change in health care: Theory and practice. Int J Qual Health Care. 2003; 15:111–118.
7. Zohar D. Safety climate in industrial organizations: theoretical and applied implications. J Appl Psychol. 1980; 65: 96–102.
8. Saunders M, Lewis P, Thornhill A. Research Methods for Business Students. (3th ed.). Upper Saddle River, N.J.: Prentice Hall; 2003.
9. European Agency for Safety and Health at Work. E-guides/e-tools. Available online: <https://osha.europa.eu/en/tools-and-resources/e-guides>.
10. Bandzienė A. Kompleksinis Streso Darbe Valdymas (Complex Stress Management at Work). Ph.D. Thesis, ISM Vadybos ir Ekonomikos Universitetas, Kaunas, Lithuania, 2009.
11. Gustainienė L, Bakšienė V. Medicinos darbuotojų stresogeninių darbo veiksnių sąsajos su socialiniu palaikymu ir subjektyvia sveikata. Visuomenės sveikata. 2008; 2(41): 47–55.

12. The Labour Research Department for the Social Dialogue Committee for Central Government Administrations. Well-being and occupational safety & health (OSH) in central government administrations: tackling psychosocial risks at work. EUPAE & TUNED; 2017. Available online: <https://www.epsu.org/de/search?f%5B0%5D=policies%3A172&f%5B1%5D=sectors%3A88&search_api_fulltext=&page=1>.
13. Lambert TW, Smith F, Goldacre JM. Why doctors consider leaving UK medicine: qualitative analysis of comments from questionnaire surveys three years after graduation. Journal of the Royal Society of Medicine. 2017; 111(1):18–30.
14. European Agency for Safety and Health at Work. Risk assesment in health care. E-facts 18; 2007. Available online: <http://www.osha.europa.eu/en/publications/e-facts/efact18>.
15. Froneberg B. National and international response to occupational hazards in the healthcare sector. Ann NY Acad Sci. 2006; 1076:607–14.
16. The Lithuanian National Health System Sector Collective Agreement. Available online: https://sam.lrv.lt/lt/teisine-informacija/sakos-kolektyvines-sutartys (accessed on 2018).
17. Aiken LH, Sloane DM. Hospital staffing, organization, and quality of care: cross-national findings. International Journal for Quality in Health Care. 2002; 14(1):5 13.
18. Biswas S, Bhatnagar J. Mediator Analysis of Employee Engagement: Role of Perceived Organizational Support, P-O Fit, Organizational Commitment and Job Satisfaction. The Journal for Decision Makers. 2013; 38(1):27–40.
19. Visser MRM, Smets EMA, Oort FJ, de Haes HCJM. Stress, satisfaction and burnout among Dutch medical specialists. Canadian Medical Association Journal. 2003; 168(3):271–5.
20. Cox T, Griffiths A, Rial-Gonzalez E. Research on work related stress. Luxembourg: Office for Official Publications of the European Communities; 2000.

21. Vanagas G, Bihari-Axelsson S, Vanagienė V. Do age, gender and marital status influence job strain development for general practitioner? Medicina. 2004; 40:1014–1018.
22. Rauschenbach C, Krumm S, Thielgen M, Hertel G. Age and work-related stress: A review and meta-analysis. J. Manag. Psychol. 2013; 28:781–804.
23. Ramos R, Jenny G, Bauer G. Age-related effects of job characteristics on burnout and work engagement. Occupational Medicine. 2016; 66:230–237.
24. Brewer EW, Shapard L. Employee Burnout: a meta-analysis of the relationship between age or years of experience. Hum Resour Dev Rev. 2004; 3:102–123.
25. Marinaccio A, Ferrante P, Corfiati M, Tecco C, Rondinone BM, Bonafede M, Ronchetti M, Persechino B, Iavicoli S. The relevance of socio-demographic and occupational variables for the assessment of work-related stress risk. BMC Public Health. 2013; 13:1157–1165.
26. Krogstad U, Hofoss D, Veenstra M, Hjortdahl P. Predictors of job satisfaction among doctors, nurses and auxiliaries in Norwegian hospitals: Relevance for micro unit culture. Hum. Resour. Health. 2006; 4:3–10.
27. Chan KB, Lai G, Ko YC, Boey KW. Work stress among six professional groups: The Singapore experience. J. Soc. Sci. Med. 2000; 50:1415–1432.
28. Basu S, Harris A, Mason S, Norman J. A longitudinal assessment of occupational stress in Emergency Department Nursing Staff. J. Nurs. Manag. 2019; 28:167–174.
29. Žutautienė R, Radišauskas R, Ustinavičienė R, Kirvaitienė J, Rakutytė K. Gydytojų psichosocialiniai darbo aplinkos veiksniai ir jų sąsajos su gyvenimo kokybe. Sveikatos mokslai. 2019; 29(4):53–59.
30. Heponiemi T, Kouvonen A, Aalto AM, Elovainio M. Psychosocial factors in GP work: The effects of taking a GP

position or leaving GP work. Eur J Public Health. 2012; 23:361–366.
31. Nikolic D, Višnjic A. Mobbing and Violence at Work as Hidden Stressors and Work Ability among Emergency Medical Doctors in Serbia. Medicina. 2020; 56:31.
32. Moustaka E, Constantinidis TC. Sources and effects of Work-related stress in nursing. Health Science Journal. 2010; 4(4): 210–216.
33. Currie G, Finn R, Martin G. Role transition and the interaction of relational and social identity: new nursing roles in the English NHS. Organ Stud. 2010; 31:941–61.
34. Chen T, Hao S, Ding K, Feng X Li G, Liang X. The impact of organizational support on employee performance. Employee Relations. 2020;42: 166–179.
35. Eurostat: Majority of health jobs held by women. Available online: <https://ec.europa.eu/eurostat/web/products-eurostatnews/-/DDN-20200409-2>.
36. Institute of Work, Health & Organisations. Towards the Development of a European Framework for Psychosocial Risk Management at the Workplace. Nottingham, UK; 2008.

CURRICULUM VITAE

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EDUCATION		
Institution	**Qualification, degree**	**Year**
Vilnius University	Doctoral studies, Medicine and Health Sciences, Public Health	2015–2021
Lithuanian University of Health Sciences	MSc in Health Sciences, Pharmacist	1991–1996
WORK EXPERIENCE		
Institution	**Position**	**Period**
Ministry of Health of the Republic of Lithuania	Chief officer of the Strategic planning and management division	2008–present
European Commission DG SANTE	Seconded National Expert (Policy analyst)	2018–2020
Vilnius University/Faculty of Medicine	Teaching Assistant	2017–2018
World Health Organization	National contact point for Evidence-informed Policy Network.	2014–2018
World Health Organization	Reviewer of the Policy Brief: “Suicide Prevention: What Can The Gatekeepers of Health Sector Do?”	2015–2016
The Institute of Hygiene	Expert in the project “The determination of strategic directions on public health development”	2014–2015

European Commission DG SANTE	National expert in professional training in the field of health and consumer protection, risk assessment	2007–2008
The Standing Committees on medicinal products for human use of the European Commission	National expert on medicinal products for human use	2003–2008
PROFESSIONAL AFFILIATIONS		
European Commission Joint Research Centre Science Hub Communities	Member of EU4FACTS – Evidence for Policy Community	2020–present

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