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An Examination of Work Conditions and Well-Being of Slovene Train Drivers

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Background and purpose: While the occupation of a train driver can be likened to other transportation professions like truck or bus drivers, it is essential to note that there are distinct hazards exclusive to this role that have a notable impact on the mental and physical well-being of train drivers. The study aims to define personal characteristics, work organisation and work characteristics, professional development and work in general in connection with risk factors among employees who perform the work tasks of train drivers in railway transport.
Methodology: The study on train drivers in Slovenia was conducted with 179 participants, representing 13.3% of the total population of train drivers. The sample was predominantly male and varied in age, most hailing from the Podravska region. The OPSA digital tool was used to analyse risk factors and gauge psychosocial stress across 17 areas, using a questionnaire split into two sections. Data was collected through online and physical surveys, with voluntary and anonymous participation.
Results: The study found that the personal characteristics of train drivers do not significantly impact their perception of workplace workload. While professional development factors negatively influenced workload perception, the impact was not statistically significant. However, general work characteristics strongly impact how train drivers perceive their workload. These findings suggest that interventions should focus on modifying general work characteristics to improve train drivers' work conditions.
Conclusions: These findings have important implications for the railway industry. They suggest that interventions aimed at improving the work conditions of train drivers should focus on modifying general work characteristics rather than targeting personal characteristics or professional development factors. Future research should explore these relationships and develop strategies to mitigate the identified risk factors.

Keywords: *Work conditions, Well-being, Train drivers, Psychosocial risk factors*

1 Introduction

Human error has been identified as the primary cause of traffic accidents in studies (e.g., Edkins & Pollock, 1997; Wilde & Stinson, 1983; Chang & Ju, 2008). This is also true for railway traffic. Train drivers operate in a demanding environment requiring high concentration, skill, and resilience. Their work conditions can significantly impact safety, stress levels, and sleep patterns. For instance, the work hours and physical work environment have been identified as significant contributors to workload (Kecklund et al., 1999). Moreover, the profession often involves shift work and long hours, leading to sleep disorders and fatigue (Samerei et al., 2020). In addition to the physical demands, train drivers also face psychological challenges. The responsibility for the safety of passengers and goods can lead to high stress levels (Kecklund et al., 1999). Fur-

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thermore, the solitary nature of the job can contribute to feelings of isolation and impact mental health (Samerei et al., 2020). Professional development is another crucial aspect of a train driver's work life. The rapidly evolving technology in the railway industry necessitates continuous learning and adaptation. However, the high-stress environment and demanding work schedules can make it challenging for drivers to pursue further training and development (Olsson, Lidestam & Thorslund, 2021). The physical work environment of train drivers is also unique and can significantly impact their performance. For example, the cab environment is crucial. Ergonomic facilities that reduce strain and stress are essential, especially considering drivers tend to work long hours in the same position. The design of the cab and drivers' attitudes towards it have been assessed in various studies. System design-related factors such as the position of running signals, visibility of different signal types, and platform location about the travelling direction can influence the propagation of driver-related incidents. Train drivers often work full-time; some work more than 40 hours per week. This can lead to fatigue and stress, impacting their performance and health. Railroad workers typically need several months of on-the-job training. This training often includes understanding and adapting to the physical work environment (Rjabovs et al., 2015). Understanding these aspects is crucial for improving the work conditions of train drivers and enhancing their overall well-being. However, there is no consensual agreement around a single definition of well-being (Qureshi et al., 2022). Generally, well-being can be defined as considering life positively and feeling good (Diener, Suh & Oishi, 1997; Veenhoven, 2008). Well-being, a vital construct expounded in positive psychology, is a state of overall mental and physical health, strength, resilience and fitness to function well at work and personally (Qureshi et al., 2022; NHS, 2023). Personal well-being, life satisfaction, and overall health are vital for work (Sokić, Qureshi & Khawaja, 2021).

Risk factors contributing to health issues among train drivers are multifaceted. They include long working hours, shift work, exposure to traumatic incidents, and workplace violence (Carnall et al., 2022). Specific to train drivers, factors such as rest and sleep schedules, workload, automation levels, and use of mobile devices can lead to central nervous fatigue and cognitive distraction. These factors can result in loss of concentration, slow reaction times, and dangerous driving behaviour (Sajid et al., 2008).

Train driving, being a safety-critical job as defined in relevant regional legislation, requires the driver to work calmly, rested, and adequately trained, as outlined in the Rulebook on special health conditions for obtaining and maintaining the validity of a train driver's license. Peters and O'Conner (1988) emphasise specific skills required of train drivers, including remembering and summarising information, anticipating and assessing the influence of various factors affecting train operation, reacting quickly, controlling events, and maintaining concentration. Train drivers are exposed to specific psychosocial risks. Risks include both those arising from the nature of the job: train drivers' work is primarily sedentary, and electromagnetic waves and vibrations from the locomotive running on tracks negatively impact their health and well-being, as well as personal risks: stress, illnesses, psychological consequences of traumatic events, private life, and more (Wilson et al., 2017). An important component of the psychosocial work environment is influencing and controlling one's work environment. The work of a train driver, i.e., train management and related activities, is strictly regulated and governed by several regulations and is also conditioned by technical conditions and instructions (Doroga & Baban, 2013).

In recent years, there has been an increase in research aimed at understanding the factors that influence the health of train drivers. The initial studies on risk factors can be traced back to the 1970s (Sussman & Ofsevit, 1976). It is worth noting that research focusing on the unique aspects of the train driver profession experienced a slowdown during the 1980s and early 1990s. However, new technical and system discoveries, operational reorganisations, efficiency enhancement efforts, and the need for reliable and safe railway traffic development, particularly post-2000, have spurred various research programs. These programs delve into the factors affecting train drivers' work and deepen the understanding of human factors, their interrelationships, and their specificities in railway transport. Behavioural observation research involving train drivers began in the early 1970s. Sussman and Ofsevit (1976) observed that train drivers process a substantial amount of diverse information while operating a train, a finding that was corroborated by later studies (Naweed et al., 2018; Hamilton & Clarke, 2005). This information processing was found to be significantly more extensive than previously thought. Other studies have also explored specific risk factors (Wang et al., 2021; Wickens, 2002).

Recent research has made several significant findings regarding the health of train drivers. A study by Olsson, Lidestam, and Thorslund (2021) found that many exceptional cases are generally insufficiently practised during the internship of train drivers and, therefore, should be practised in simulators. The study also found that experienced and novice drivers prioritise safety over efficiency. Research by Naweed (2014) showed positive reductions in some coronary heart disease indicators, such as systolic blood pressure, total cholesterol, and smoking levels, in train drivers over several years. However, the proportions of drivers who are obese or have diabetes or pre-diabetes have all increased significantly over time. Naweed et al. (2017, pp. 264-273) state that "sleep patterns, diet, occupational stress, workplace ergonomics, fitness motivation, and family or social life conflicts influence the health of

train drivers." This study, conducted in Australia, concludes, "In the field of occupational health, the organisation of work, the ergonomics of workplaces must be adequately addressed, and employees must be guided towards healthy lifestyle behaviour". The study highlights issues in organisational culture, such as communication, inadequate organisational support, and existing social norms. Barriers to work planning included fatigue, stimulant dependence, and unsettled family life. Regulatory frameworks of a healthy lifestyle included the study participants' eating and exercise habits or patterns. Other studies (Lavrič, 2017) identify the significant impact of traumatic events on train drivers' psychological health and the potential for developing cancer due to pathogens (Verma et al., 2003) among the more common risks associated with this profession. According to Doroga and Baban (2013), the driver's job also includes gastrointestinal problems, stress-related cardiological problems, musculoskeletal pain due to forced posture, hearing damage, and degenerative diseases of the spine caused by train vibrations. Zoer, Sluiter, and Frings-Dresen (2014) note that the job demands for train drivers include high emotional and mental stress, limited autonomy, and prudence.

Given the necessity for complete concentration in train driving and related tasks, it is understandable that mental and physical health issues can pose significant risks in such an environment. The increasing capacity of traction means and the growing complexity of railway systems add to the tasks performed by train drivers. Cognitive and perceptual abilities are dominant, as noted by Tichon (2007). Even a minor error by a train driver, potentially caused by poor health or lack of concentration, can have severe consequences, endangering lives and health and causing substantial material damage. For this reason, in this study, we define personal characteristics, work organisation and work characteristics, professional development and work in general in connection with risk factors among employees who perform the work tasks of train drivers in railway transport. We also pinpoint crucial risk factors for developing health issues among train drivers.

Methodology

Sample

Data for the study was gathered from respondents who were invited to participate with assistance from the Human Resources Department of Slovene Railways, the Representative Trade Union of Train Drivers, and the Service for Sustainable Mobility and Transport Policy at the Ministry of Infrastructure. These organisations provided the email addresses, and we sent a link to the online survey.

The total number of train drivers in the Republic of Slovenia is 1,341. We received 179 completed survey questionnaires, representing 13.3% of the total population of train drivers.

All 179 participants who completed the questionnaire are part of the occupational group of train drivers. The sample is predominantly male, with 99.4% male and 0.6% female participants.

The age distribution of the survey participants is as follows: 39.7% are between 41 and 50 years old, 25.7% are between 51 and 65 years old, 24.0% are between 31 and 40 years old, and 10.1% are between 18 and 30 years old. There were no respondents older than 65 years.

In terms of regional residence, the most significant number of participants hail from the Podravska region (20.7%), followed by the Primorsko-notranjska region (13.4%), and then the Savinjska (10.6%), Gorenjska (10.6%), and Obalno-kraška regions (10.1%). The Pomurska (0.6%), Goriška (1.7%), and Zasavska (5.0%) regions have the most miniature representation in the sample.

Two-thirds of the participants (67.4%) are employed in the region where they reside, while 32.6% are employed outside their region of residence.

Instrument

Risk factors are analysed using the OPSA digital tool for managing psychosocial risks and absenteeism, with the approval of the Research Centre of the Slovenian Academy of Sciences and Arts (ZRC SAZU). This self-assessment questionnaire is a validated instrument that gauges the psychosocial stress of employees across 17 distinct areas. The analysis allows for developing specific, targeted strategies for managing psychosocial risks based on the measured situation (Šprah & Dolenc, 2014).

The questionnaire was split into two sections. The first, or fundamental section, contained questions about the respondents' socio-demographic characteristics and health status. The second section comprised a self-assessment questionnaire with 130 statements about the respondent's work and organisational characteristics.

Respondents evaluated the degree to which individual statements and descriptions applied to them using a five-point scale, where 1 signifies 'I do not agree at all/does not apply to me' and 5 signifies 'I strongly agree/applies to me'.

Procedure

We employed two data collection methods. We gathered data via an online questionnaire and physical surveys handed to respondents, which were later manually converted to electronic format.

We electronically collected the data using the 1.ka application. We designed an online questionnaire identical in content to the physical questionnaire filled out by the respondents. We emailed the link to the online questionnaire to 73.2% of the respondents, while the remainder received

paper-and-pen versions. Participation in the research was voluntary and anonymous for all participants.

Results

In the beginning, we checked the reliability of the measuring instrument using the Cronbach alpha coefficient, which checks the internal consistency of the measuring instrument. Reliability means that we would get similar results if we measured again. We can discuss sufficient reliability when the coefficient value exceeds $\alpha = 0.7$ (Field, 2009).

Based on the results, we find that almost all sets of indicators, based on which the merging into standard variables took place, are appropriately reliable. The Cronbach coefficient exceeds the recommended value $\alpha = 0.7$.

In constructing the risk factor model emphasising managing the psychosocial risks of train drivers, we used two multivariate statistical methods - the structural equation model and regression analysis (Appendix 1).

We initially constructed an SEM model using AMOS 26. This model included all variable relationships, such as correlations, influences, and errors. The model's general assumptions included sufficient sample size, numerical and normally distributed variables, complete data or appropriate handling of missing data, and a theoretical model that served as the foundation for the baseline model. We substituted missing values in the model with average values, ensuring that each variable had at most 5 per cent missing values. The imputation process was conducted using IBM SPSS 27. We examined the recommended modifications for the model to fit the data optimally; following these recommendations (termed "modification indices" - free instead of constrained), we fine-tuned the model to align the parameters as closely as possible with the suggested values. The factor weight with the strongest association with the latent variable was fixed and assigned a value of 1.

Table 1: Reliability of the measuring instrument

	Theoretical constructs	Cronbach Alpha
OPSA profile	Employee's family circumstances (5 statements)	0,783
	Interpersonal relationships at work (7 statements)	0,802
	Strains as a result of socio-demographic circumstances (8 statements)	0,824
	Personality characteristics (10 statements)	0,824
	Career development (10 statements)	0.837
	Organisational culture (11 statements)	0.914
	Organisational structure (7 statements)	0.733
	Attitude to work (9 statements)	0.744
	Content of work (6 statements)	0.660
	Supervision (4 statements)	0.542
	Care for oneself (8 statements)	0.776
	Psychophysical health status (5 statements)	0.733
	Separation of private life and work (9 statements)	0.716
	Workload, speed of work (9 statements)	0.712
	Working environment and work equipment, physical strains (11 statements)	0.745
	Role and responsibility in the organisation (8 statements)	0.589
	Work schedule (6 statements)	0.721

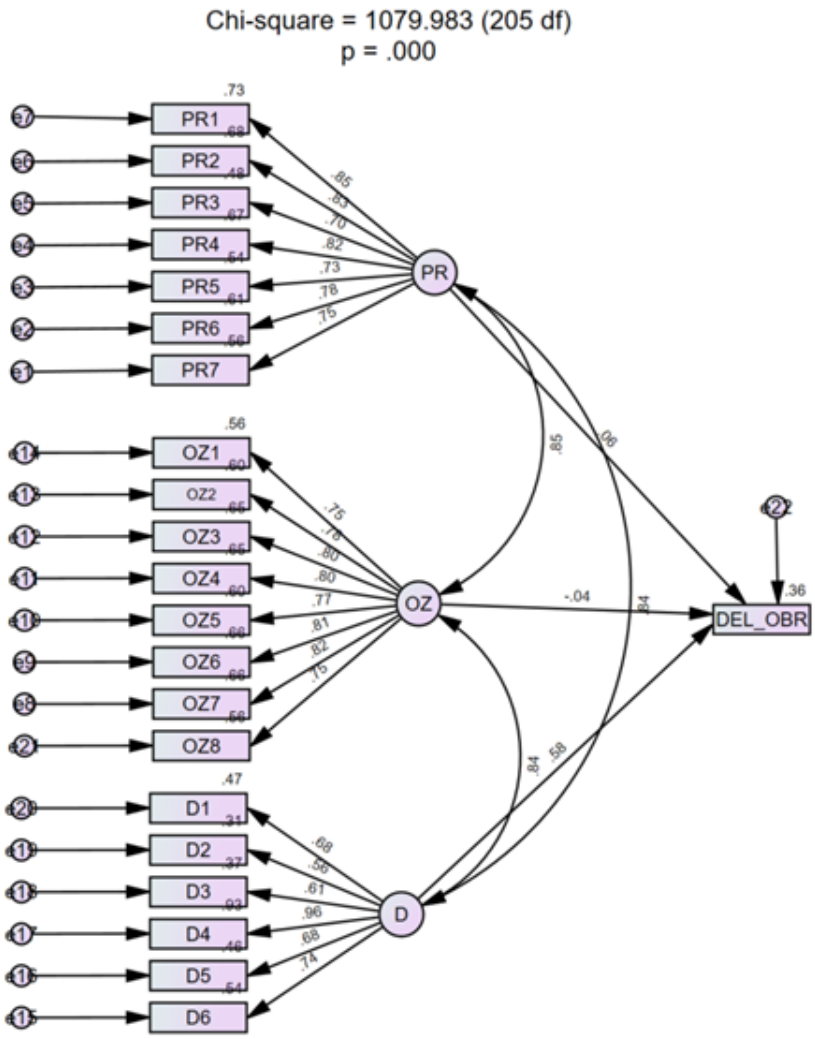

Figure 1: Standardised structural model without considering modifications

We formulated and tested the following hypotheses:

H1: The personal characteristics of train drivers (OZ) exert a statistically significant positive impact on the perception of workplace workload (DEL_OBR). This hypothesis was evaluated using a linear structural model. The independent variable in the model is a latent variable gauged through statements associated with the personal attributes of train drivers. The dependent variable is the directly measured variable of workload/workflow speed. The structural model results indicate no statistically significant influence of the independent variable on the dependent. This leads us to reject the hypothesis that train drivers' personal characteristics positively affect workplace workload perception (beta = –0.05, p = 0.759).

H2: Factors related to professional development (PR) have a statistically significant positive impact on the perception of workplace workload (DEL_OBR). This hypothesis was also evaluated using a linear structural model. The independent variable is a latent variable measured through statements associated with the professional development factors of train drivers. The dependent variable is the directly measured variable of workload/workflow speed. The hypothesis posited that professional development factors have a statistically significant positive effect on workplace workload perception, which was found to be marginally statistically significant. The structural model demonstrated a weak positive influence of this independent variable on the dependent (beta = 0.282, p = 0.077). However, we reject the hypothesis as the risk exceeds 5%.

H3: General work characteristics (D) have a statistically significant positive impact on workplace workload perception (DEL_OBR). This hypothesis was evaluated using a linear structural model. The independent variable is a latent variable measured through statements related to the general work characteristics of train drivers. The dependent variable is the directly measured variable of

workload/workflow speed. We confirmed the hypothesis that general work characteristics have a statistically significant positive impact on workplace workload perception. Statistical analysis revealed a strong positive influence of this independent variable on the dependent (beta = 0.865, $p < 0.05$).

Discussion

This study has significantly contributed to understanding the workload of train drivers, focusing on the influence of personal characteristics, career development, and work in general. The findings suggest that the factor of work, which includes self-assessment of the work environment and physical burdens, has the most statistically significant influence on the perception of workload. Compared to recent studies by Balfe et al. (2017), who presented a method to extract train driver task loads from downloads of on-train-data records, our approach aligns with their study's focus on the work environment and physical burdens as significant factors influencing workload. However, our study extends this by integrating personality characteristics and career development constructs, providing a more comprehensive understanding of the factors influencing train driver workload. Another study conducted an in-depth analysis of job satisfaction and perceived workload among subway train conductors. While this study focused on a different subset of railway workers, it underscores the importance of understanding workload and its impact on job satisfaction, a relevant aspect to consider in future research (Gottwald & Lejsková, 2023).

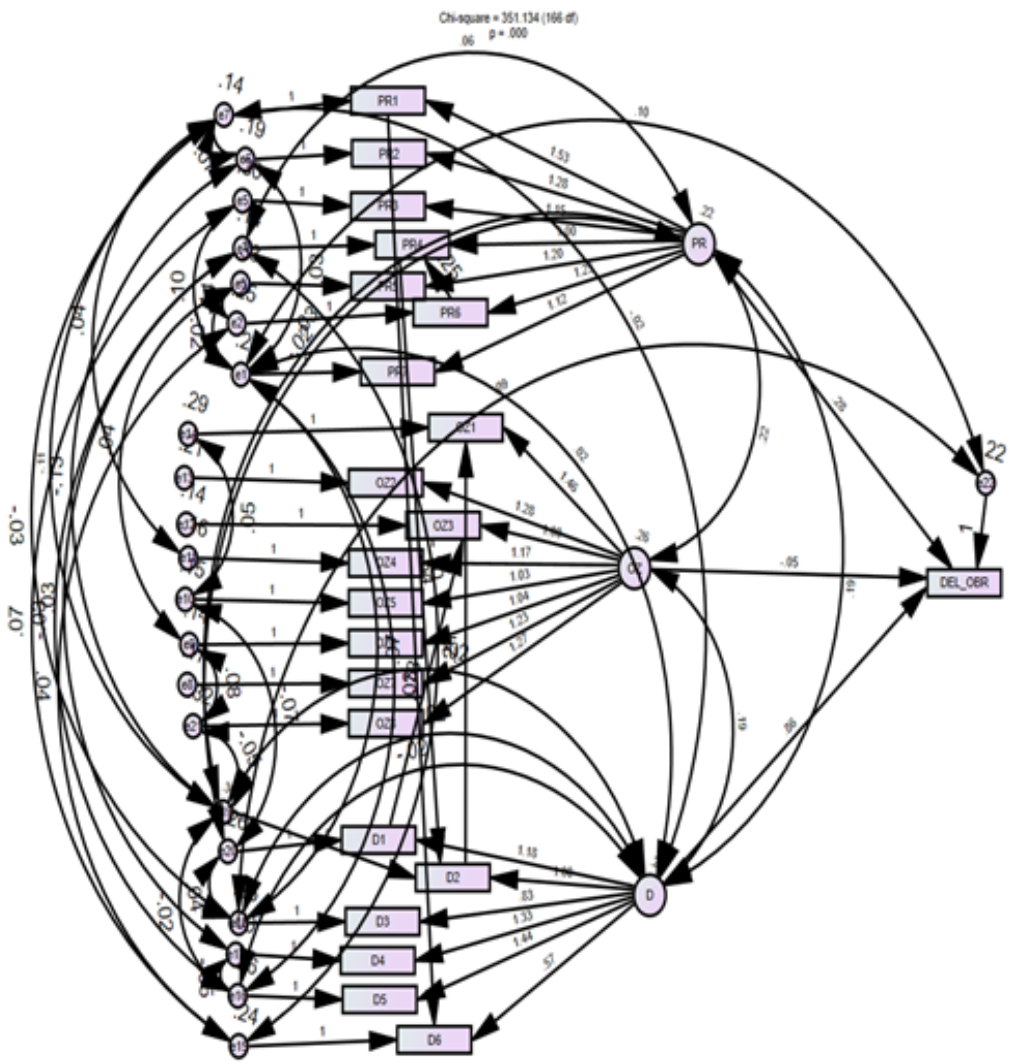

Figure 2: A standardised structural model with modifications taken into account

Human factors are essential in the safe and orderly conduct of railway traffic. Employees must be professionally trained, especially those whose jobs directly affect safe, orderly, and economical railway traffic. The main factors of railway traffic safety and quality of railway services are technical means with their functional characteristics and workers who directly participate in the operation of railway traffic and railway services (Balfe et al., 2017). Changing technology in railway traffic significantly affects the technology change, which is changing with new knowledge and staff. Safe railway traffic and quality of railway services require new techniques, technology, and knowledge, for which modern forms of education are needed. The conceptual model of risk factor integration in train drivers and the "evaluated model" represents a new version of the model of integration of constructs "personality characteristics", "career development", and "work in general", which influence the perception of "workload". In studying the choice of model for a specific organisation, we found that the degree of knowledge of the organisation as a business system also strongly influences the prevalence of the model, depending on its activity, which certainly applies to the system of organisation, such as Slovenian Railways. This research underscores the importance of focusing on general work characteristics to improve train drivers' work conditions and manage individual risk factors effectively.

Conclusions

The study provides valuable insights into the workload of train drivers, highlighting the importance of general work characteristics over personal characteristics and professional development factors. However, it is important to acknowledge the limitations of this research. Firstly, the study was conducted in Slovenia with a sample representing 13.3% of the total population of train drivers. While this provides a good starting point, the findings may not be generalisable to train drivers in other countries or regions due to cultural, infrastructural, and regulatory differences. Secondly, the study utilised the OPSA digital tool to analyse risk factors and gauge psychosocial stress. While this tool is effective, the reliance on self-reported data may introduce bias. Future studies could consider incorporating objective measures or observational data to complement self-reported data. Looking ahead, future research should continue to explore the relationships identified in this study. Specifically, more in-depth studies could be conducted to understand how different aspects of general work characteristics impact the workload of train drivers. Research could also investigate effective strategies for modifying these work characteristics to improve conditions for train drivers. Furthermore, longitudinal studies could provide insights into the long-term effects of these work characteristics on train drivers' mental and physical well-being. This could guide the development of preventative measures and early intervention strategies. In conclusion, this study underscores the importance of focusing on general work characteristics to improve train drivers' work conditions and manage individual risk factors effectively. It serves as a stepping stone for future research in this field, with the potential to significantly enhance the safety and well-being of train drivers.

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Pregled delovnih pogojev in dobrega počutja slovenskih strojevodij

Ozadje in namen: Poklic strojevodje se lahko primerja z drugimi poklici v prevozništvu, kot so vozniki tovornjakov ali avtobusov, vendar je pomembno opozoriti, da obstajajo posebna tveganja, ki so značilna za poklic strojevodje in imajo vpliv na njihovo duševno in fizično dobro počutje. Namen študije je opredeliti osebne značilnosti, organizacijo dela in značilnosti dela, profesionalni razvoj in delo na splošno, v povezavi z dejavniki tveganja med strojevodji.
Metodologija: Študija o strojevodjih v Sloveniji je bila izvedena na 179 udeležencih, kar predstavlja 13,3% celotne populacije strojevodij. V vzorcu so bili večinoma moški različnih starosti, večina pa izhaja iz Podravske regije. Za namen raziskave je bil uporabljen OPSA vprašalnik za analizo dejavnikov tveganja in merjenje psihosocialnega stresa na 17 področjih. Podatki so bili zbrani prek spletnega in fizično razdeljenega vprašalnika, udeležba pa je bila prostovoljna in anonimna.
Rezultati: S pomočjo raziskave smo ugotovili, da osebne značilnosti strojevodij ne vplivajo bistveno na njihovo zaznavanje obremenitve na delovnem mestu. Medtem ko so dejavniki profesionalnega razvoja pokazali šibek pozitiven vpliv na zaznavanje obremenitve, vpliv ni bil statistično pomemben. Splošne značilnosti imajo močan pozitiven vpliv na to, kako strojevodje zaznavajo svojo obremenitev. Rezultati nakazujejo, da bi morale intervencije osredotočiti na spreminjanje splošnih značilnosti dela za izboljšanje delovnih pogojev strojevodij.
Zaključki: Rezultati imajo pomembne izsledke za železniško industrijo. Nakazujejo, da bi morale intervencije, namenjene izboljšanju delovnih pogojev strojevodij, osredotočiti na spreminjanje splošnih značilnosti dela, namesto da bi ciljale na osebne značilnosti ali dejavnike profesionalnega razvoja. Prihodnje raziskave bi morale nadalje raziskovati te odnose in razvijati strategije za zmanjšanje identificiranih dejavnikov tveganja.

Ključne besede: *Delovni pogoji, Dobro počutje, Strojevodje, Psihosocialni dejavniki tveganja*

Appendix 1

SEM MODEL

Computation of degrees of freedom (Default model)
Number of distinct sample moments: 253
Number of distinct parameters to be estimated: 87
Degrees of freedom (253–87): 166

Result (Default model)
Minimum was achieved
Chi-square = 351.134
Degrees of freedom = 166
Probability level = 0,000

Estimates (Group number 1 – Default model)
Scalar Estimates (Group number 1 – Default model)
Maximum Likelihood Estimates
Regression Weights: (Group number 1 – Default model)

			Estimate	S.E.	C.R.	P	Label
PR6	<——	PR	1.226	.099	12.361	***	W2
PR4	<——	PR	1.000				
PR4	<——	PR6	.250	.054	4.597	***	
PR1	<——	PR	1.533	.107	14.316	***	W6
D2	<——	D	1.000				
D1	<——	D	1.176	.215	5.470	***	W17
D2	<——	PR4	–.098	.091	–1.086	.278	
PR7	<——	PR	1.122	.096	11.722	***	W1
PR5	<——	PR	1.197	.109	10.957	***	W3
PR3	<——	PR	1.153	.109	10.611	***	W4
PR2	<——	PR	1.276	.101	12.671	***	W5
OZ7	<——	OZ	1.229	.112	10.950	***	W7
OZ6	<——	OZ	1.037	.098	10.613	***	W8
OZ5	<——	OZ	1.025	.097	10.575	***	W9
OZ4	<——	OZ	1.169	.107	10.917	***	W10
OZ3	<——	OZ	1.000				
OZ2	<——	OZ	1.280	.120	10.657	***	W11
OZ1	<——	OZ	1.465	.144	10.177	***	W12
D6	<——	D	.575	.154	3.735	***	W13
D5	<——	D	1.439	.268	5.367	***	W14
D4	<——	D	1.331	.224	5.937	***	W15
D3	<——	D	.829	.173	4.795	***	W16
OZ8	<——	OZ	1.274	.129	9.868	***	W18
DEL_OBR	<——	PR	.282	.159	1.771	.077	W19
DEL_OBR	<——	OZ	–.050	.162	–.306	.759	W20
DEL_OBR	<——	D	.865	.227	3.818	***	W21
OZ1	<——	D2	–.214	.061	–3.486	***	
OZ3	<——	D1	.126	.053	2.354	.019	
D6	<——	PR1	.636	.061	10.345	***	

Standardised Regression Weights: (Group number 1 – Default model)

			Estimate
PR6	<——	PR	.752
PR4	<——	PR	.566
PR4	<——	PR6	.230
PR1	<——	PR	.886
D2	<——	D	.601
D1	<——	D	.719
D2	<——	PR4	–.110
PR7	<——	PR	.762
PR5	<——	PR	.698
PR3	<——	PR	.705
PR2	<——	PR	.810
OZ7	<——	OZ	.838
OZ6	<——	OZ	.812
OZ5	<——	OZ	.808
OZ4	<——	OZ	.834
OZ3	<——	OZ	.744
OZ2	<——	OZ	.816
OZ1	<——	OZ	.853
D6	<——	D	.294
D5	<——	D	.814
D4	<——	D	1.001
D3	<——	D	.568
OZ8	<——	OZ	.757
DEL_OBR	<——	PR	.196
DEL_OBR	<——	OZ	–.038
DEL_OBR	<——	D	.571
OZ1	<——	D2	–.180
OZ3	<——	D1	.134
D6	<——	PR1	.592

Covariances: (Group number 1 – Default model)

			Estimate	S.E.	C.R.	P	Label
OZ	<—>	D	.192	.041	4.746	***	C1
PR	<—>	OZ	.217	.025	8.806	***	C2
PR	<—>	D	.186	.035	5.250	***	C3
e4	<—>	PR	.061	.010	6.308	***	
e7	<—>	D	–.025	.007	–3.302	***	
e20	<—>	PR	–.024	.009	–2.797	.005	
e19	<—>	D	.017	.012	1.365	.172	
e19	<—>	PR	.028	.017	1.703	.088	
e7	<—>	e19	–.109	.022	–4.877	***	
e10	<—>	e20	–.074	.015	–4.987	***	
e1	<—>	e5	.098	.016	6.121	***	
e18	<—>	e7	–.035	.011	–3.111	.002	
e11	<—>	e7	.040	.011	3.541	***	
e9	<—>	e21	.077	.018	4.147	***	
e6	<—>	e7	.065	.015	4.491	***	
e3	<—>	e2	.139	.024	5.691	***	
e1	<—>	D	.022	.008	2.705	.007	

Continues

			Estimate	S.E.	C.R.	P	Label
e1	<—>	e22	.102	.014	7.059	***	
e1	<—>	e18	.068	.015	4.482	***	
e18	<—>	D	.022	.010	2.125	.034	
e18	<—>	e22	.089	.018	4.940	***	
e16	<—>	D	–.018	.018	–1.009	.313	
e16	<—>	e17	–.050	.016	–3.124	.002	
e10	<—>	e14	.047	.017	2.779	.005	
e6	<—>	e19	–.126	.023	–5.408	***	
e5	<—>	e15	.067	.017	4.041	***	
e17	<—>	e4	.032	.007	4.424	***	
e16	<—>	e19	–.020	.027	–.739	.460	
e16	<—>	e4	–.035	.016	–2.211	.027	
e1	<—>	e16	.026	.016	1.649	.099	
e1	<—>	e3	–.023	.011	–2.072	.038	
e3	<—>	e9	.045	.014	3.272	.001	
e21	<—>	e19	–.046	.021	–2.136	.033	
e18	<—>	e20	.040	.016	2.468	.014	
e15	<—>	e2	.040	.015	2.632	.008	
e1	<—>	e6	.032	.009	3.527	***	
e15	<—>	e4	.095	.015	6.555	***	

Correlations: (Group number 1 – Default model)

			Estimate
OZ	<-->	D	.847
PR	<-->	OZ	.908
PR	<-->	D	.892
e4	<-->	PR	.356
e7	<-->	D	–.147
e20	<-->	PR	–.103
e19	<-->	D	.063
e19	<-->	PR	.100
e7	<-->	e19	–.481
e10	<-->	e20	–.384
e1	<-->	e5	.401
e18	<-->	e7	–.186
e11	<-->	e7	.271
e9	<-->	e21	.358
e6	<-->	e7	.401
e3	<-->	e2	.478
e1	<-->	D	.110
e1	<-->	e22	.486
e1	<-->	e18	.304
e18	<-->	D	.097
e18	<-->	e22	.380
e16	<-->	D	–.081
e10	<-->	e14	.231
e6	<-->	e19	–.482

Continues

			Estimate
e5	<-->	e15	.252
e16	<-->	e19	–.065
e16	<-->	e4	–.185
e1	<-->	e16	.112
e1	<-->	e3	–.090
e3	<-->	e9	.205
e21	<-->	e19	–.134
e18	<-->	e20	.156
e15	<-->	e2	.162
e1	<-->	e6	.168
e15	<-->	e4	.532

Variances: (Group number 1 – Default model)

	Estimate	S.E.	C.R.	P	Label
PR	.220	.022	10.160	***	V1
OZ	.260	.047	5.506	***	V2
D	.198	.069	2.867	.004	V3
e2	.254	.028	9.021	***	
e4	.135	.018	7.572	***	
e7	.142	.019	7.551	***	
e19	.364	.039	9.460	***	
e20	.257	.027	9.454	***	
e22	.220	.022	10.160	***	V1
e1	.200	.020	10.043	***	
e3	.332	.035	9.584	***	
e5	.296	.032	9.391	***	
e6	.188	.021	9.159	***	
e8	.166	.020	8.212	***	
e9	.145	.017	8.499	***	
e10	.146	.017	8.492	***	
e11	.156	.019	8.238	***	
e12	.145	.017	8.480	***	
e13	.214	.025	8.408	***	
e14	.287	.034	8.333	***	
e15	.237	.025	9.652	***	
e16	.262	.044	5.907	***	
e17	–.001	.009	–.075	.941	
e18	.251	.026	9.477	***	
e21	.315	.036	8.737	***	

Squared Multiple Correlations: (Group number 1 – Default model)

	Estimate
PR6	.565
PR4	.803
D1	.516
D2	.335
PR1	.785
DEL_OBR	.516
OZ8	.573
D3	.407
D4	1.002
D5	.578
D6	.688
OZ1	.626
OZ2	.666
OZ3	.692
OZ4	.695
OZ5	.652
OZ6	.659
OZ7	.703
PR2	.656
PR3	.497
PR5	.487
PR7	.581

Model Fit Summary

CMIN

Model	NPAR	CMIN	DF	P	CMIN/DF
Default model	87	351.134	166	.000	2.115
Saturated model	253	.000	0		
Independence model	22	4380.793	231	.000	18.964

RMR, GFI

Model	RMR	GFI	AGFI	PGFI
Default model	.065	.849	.769	.557
Saturated model	.000	1.000		
Independence model	.360	.115	.031	.105

Baseline Comparisons

Model	NFI Delta1	RFI rho1	IFI Delta2	TLI rho2	CFI
Default model	.920	.888	.956	.938	.955
Saturated model	1.000		1.000		1.000
Independence model	.000	.000	.000	.000	.000

Parsimony-Adjusted Measures

Model	PRATIO	PNFI	PCFI
Default model	.719	.661	.687
Saturated model	.000	.000	.000
Independence model	1.000	.000	.000

NCP

Model	NCP	LO 90	HI 90
Default model	185.134	135.101	242.924
Saturated model	.000	.000	.000
Independence model	4149.793	3938.498	4368.363

FMIN

Model	FMIN	F0	LO 90	HI 90
Default model	1.973	1.040	.759	1.365
Saturated model	.000	.000	.000	.000
Independence model	24.611	23.313	22.126	24.541

RMSEA

Model	RMSEA	LO 90	HI 90	PCLOSE
Default model	.079	.068	.091	.000
Independence model	.318	.309	.326	.000

AIC

Model	AIC	BCC	BIC	CAIC
Default model	525.134	550.953	802.437	889.437
Saturated model	506.000	581.084	1312.409	1565.409
Independence model	4424.793	4431.322	4494.915	4516.915

ECVI

Model	ECVI	LO 90	HI 90	MECVI
Default model	2.950	2.669	3.275	3.095
Saturated model	2.843	2.843	2.843	3.265
Independence model	24.858	23.671	26.086	24.895

HOELTER

Model	HOELTER .05	HOELTER .01
Default model	100	108
Independence model	11	12