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STRESS AND THE RISK OF OCCUPATIONAL BURNOUT IN LOGISTICS AND FREIGHT MANAGEMENT

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Purpose: The utilitarian purpose of the study was to verify the level of stress among employees involved in logistics and freight forwarding management and the risk of their susceptibility to occupational burnout.
Design/methodology/approach: The article is based on empirical research using questionnaires to measure stress (PSS-10) and to measure occupational burnout (LBQ), so it is based on data obtained from a control research group and statistical analysis. This was made possible by a comparative analysis of the group from the logistics industry and blue-collar workers in the surveyed organizations. The subject area is freight management and work psychology.
Findings: The article charts the high level of stress in the group of respondents on freight forwarding management and among logisticians, as they are professional groups at significant risk of burnout. The results are alarming, as they are pointing to very high levels of stress among logisticians and freight forwarders.
Research limitations/implications: The research focused on the SME sector, specifically on small shipping and logistics companies, so the results may be specific to this sector, and the sample was relatively small, which is a kind of limitation that makes the research conducted exploratory and preliminary. In the future, it would be advisable to conduct a longitudinal study and increase the research sample to see how the research would be consistent across a larger group for different transport industry converters.
Practical implications: The empirical results can provide valuable guidance for human resource management in the logistics industry. In this area it is worth introducing practical strategies and methods of stress management and it is also necessary to introduce new standards for the development of career paths and reskilling opportunities among employees, so as to effectively counteract the phenomenon of professional burnout.
Originality/value: This is the first research that spars the level of stress in the context of the risk of burnout among representatives of the logistics industry is new. Previous ones have parsed these phenomena, without an explicit link.
Keywords: stress, occupational burnout, freight management.
Category of the paper: empirical and scientific research.

1. Introduction

Stress is an indispensable part of life and is reflected in various aspects of life, especially in professional ones. And depending on the specifics of the industry, it can occur among employees in varying degrees of intensity, nevertheless it is important to manage it properly. Among other things, it is the main culprit of occupational burnout. And occupational burnout, in turn, is a phenomenon that can be encountered in various industries, which involves a long-term syndrome resulting from physical emotional physical and mental exhaustion. Its direct consequences can be a reduction in the quality of work, a loss of motivation, or an increase in absenteeism and even resignation from the workplace. Nevertheless, it is largely the sector and industry that determine the magnitude of this threat. In logistics and transportation management, due to their characteristics and dynamics, this problem can be of great importance. The purpose of this study is to examine the relationship of stress levels and the risk of burnout and their interrelationship among employees associated with logistics and transportation management. Transport managers, logisticians, or freight forwarders work under a lot of time pressure and have to coordinate many processes simultaneously often without having a full picture of the situation, which translates into the stress they feel. This is not an easy or routine job and therefore requires a lot of commitment and effort on their part. Such conditions can also lead to occupational burnout. Thus, there is an assumption that the specifics of the industry result in higher levels of stress, and that this stress is directly related to higher levels of risk of burnout. The literature indicates that stress among logistics and distribution personnel is associated with low levels of well-being (Fruscione et al., 2024) and that one of the most important problems encountered in the management of employees in the logistics sector is their decrease in job satisfaction and commitment (Yener et al., 2014) for this reason it was assumed that there may be a link between these phenomena.

2. Logistics management challenges

Due to high pace of economy development there is a greater need for fast and agile approach in logistics management. Very fragile on one hand, on the other very turbulent environment causes lots of challenges for logisticians. The logistics industry has undergone significant changes in recent years, driven by technological advances, changing customer expectations and globalization. One of the most important trends in logistics is the automation and digitization of processes. The introduction of technologies such as artificial intelligence (AI) (Brzozowska, et al., 2023), the Internet of Things (IoT), Big Data (Hopkins, Hawking, 2018) and blockchain (Choi, Siqin, 2022) has significantly impacted the way supply chains are managed. Driven by

those changes, logistics management has become an agile, virtual world were machines and people work together. Above mentioned technologies have impact on operations, strategic business models, pace of work, but first of all, influence work of people who carry out the logistic processes. Due to that, there is a greater need for new competences, not only technological ones, but people need to be prepared better for the fast pace of analytical thinking.

Changing customer expectations are also having a huge impact on the logistics industry. Today, consumers expect fast, flexible and low-cost deliveries. In response to these demands, logistics companies need to invest in new technologies that allow them to develop more agile operating models. An important example is logistic of last-mile delivery (Kolasińska-Morawska et al., 2023). The implementation in of autonomous vehicles, robots or drones in deliveries, could significantly revolutionize this market segment in the future. It means that more operations can be done by machines, however on the other hand people are still need, because behind each of those innovations should stand a human who is making strategic decisions. That decision can make difference in usage of technology, machine or model of business. Due to that people need to be preparing for responsibilities concerning the effects of their attitude towards these technological advancements.

In contrast, one of the key drivers of change in modern logistics is the concept of sustainability, which is the result of both regulations and growing consumer awareness (Kolasińska-Morawska et al., 2022). Companies are increasingly paying attention to the green aspects of their operations, aiming to reduce CO2 emissions and minimize their negative impact on the environment. The introduction of electric vehicles, the optimization of delivery routes and the use of renewable energy sources are just some of the measures being taken to increase the sustainability of supply chains.

Due to all of these challenges, logistic industry is changing constantly, and logisticians are trying to keep up with the pace of those changes. Whole industry in Poland, but also worldwide develops very fast as there is still increase in demand for logistic services. Taking into account global logistics, it needs to be pointed that there is a greater need for fast and reliable transport models. Intermodal connections are those which are need the most (Tadić et al., 2021). What is more, also reliability is a key aspect of those activities. Due to the different international relations conflicts, unfortunately reliable transport corridors are not very stable (Xiaoxiang, Chengfeng, 2021; Dávid et al., 2023). Because of those problems, risk management in logistic operations has become one of the crucial factors.

Another important part of the logistics nowadays, are above mentioned last-mile deliveries and growing importance of CEP sector (CEP – courier, express, parcel). Courier companies are nowadays operating in a very polarized model, as they need to be open to the needs of their customers (which in most cases are e-commerce sales companies) and on the other hand they need to meet the requirements of their customers' customers (which are people buying online). This duality in processes is hard to achieve as on one hand there is a need for low cost operations, but on the other there flexibility and fast delivery expectations (Ghazal et al., 2025).

Considering such requirements it is expected that courier companies will be very agile in their processes, and they have to adjust very fast to the requirements of the customers.

Taking into account all of the above mentioned factors, logistics management requires special competences – technological, communications, reliable and stress resilience. It can be hard to achieve as the pace of all of the changes is huge. Due to that there can be assumed that working in logistics operations can cause lots of psychological problems.

3. The relationship of stress and risk of occupational burnout in logistics and transport management

Work-related stress or occupational stress is something that cannot be avoided. Every job with the challenges it presents is stressful in some way, it is the management of strategies to respond to it that is important especially in terms of its severity. In simpler terms, certain task situations, or generalizing in general, certain industries, can prove to be greater or lesser triggers of it. According to the Cox approach presented here, stress is a response to specific demands of the work environment that so absorb an individual that they threaten his or her well-being (Molek-Winiarska, 2020). This is important especially in the context that in a stressful environment the phenomenon of occupational burnout occurs. This issue was particularly emphasized by Maslach, spices her studies emphasized that prolonged exposure to stress in the organization is one of the important factors causing occupational burnout (Kraczla, 2013).

In the logistics industry, due to the fact that it is a job that often requires large amounts of mental and physical strength from the employee, stress among workers is a common occurrence. One of the most recent studies shows that there is a very high workload among logistics and distribution employees due to the increasing demands pressure effort difficulties and associated stress (Lara-Calle, Prado, 2023). The aforementioned stress can affect performance standards and affect low employee productivity this in turn prevents the employee from meeting the expectations of superiors and affects the success of the company. Unfortunately, feeling stressed by logistics workers often further exacerbates the problems they face, and this aforementioned stress, in and of itself, can be a very pathological self-perpetuating machine (Ramlawati, 2019). And it is for the structure that the different stress power of the logistics industry is not an important aspect of job burnout. According to a study conducted in logistics companies, a trend was observed that the longer an employee works, the higher the decrease in job satisfaction and the decrease in commitment can be observed (Yener et al., 2014). The complexity of the challenges workers face also makes it much harder to stay motivated in the profession (Meriem, 2019). Thus, this argument leads to the formulation of tree research hypotheses, namely:

1. Employees in the logistics and freight management industry will manifest high levels of stress and high levels of occupational burnout.
2. Employees in the logistics and freight management industry will manifest high levels of occupational burnout.
3. If the stress level of employees in the logistics and transportation management industry is high, their level of burnout will also be high.

In summary, stress and risk of burnout in logistics appear to be specific and, on the basis of the literature, it can be assumed with a high degree of probability that there are specific relationships between them. Their verification will give a better picture of the specificity of work in logistics and transport management and will allow the introduction of appropriate solutions to counteract them.

4. Methodology

Two questionnaires were used in the empirical study. The first is the *Perceived Stress Scale*/ *Skala Odczuwanego Stresu* (PSS-10) by Cohen, Kamarck and Mermelstein, and in the Polish adaptation by Juczynski and Oginska-Bulik, which measures the intensity of stress based on subjective feelings of subjects. It is a questionnaire that meets standards and standardization. The reliability of the scale has been established Cronbach's α coefficient was 0.90. It consists of several simple questions that must be answered by referring to a five-point scale (Molek-Winiarska, 2020). A respondent can receive a maximum of 40 points, and these are scaled. A score from zero to 13 is considered low, from 14 to 19 moderate and from 20 upwards high (Juczynski, Oginska-Bulik, 2009). The second tool, on the other hand, is the *Link Burnout Questionnaire*/ *Inwentarz wypalenia zawodowego* (LBQ) by Santinello, which was adapted to Polish conditions by Jaworowska. The test consists of 4 scales sequentially from psychophysical exhaustion loss of professional effectiveness deterioration of relations with recipients and how many from lurking. Respondents must answer 24 questions on a six-point scale. It is assumed that high thinking of the results of 3 dimensions indicates high professional burnout. In its case, the Cronbach's α value and measures of reliability and relevance are good. These meet standardization and state norms have been developed for the Polish adaptation. It can be determined with a high degree of probability that someone is at risk of burnout. (Jaworowska, 2014).

Both of the tools described were used to study the research group and the control group. The research group consisted of people working in positions such as logistician, freight forwarder, transportation manager, dispatcher before supply chain analyst, transportation planner, logistics engineer fleet coordinator, or logistics operations manager. The control group, on the other hand, consisted of people unrelated to the logistics industry holding positions

involving manual labor. These included plumbers, plasterers, laborers, road builders or maintenance workers. Age, gender, education level, financial level, marital status, and work preferences varied. The only controlled parameter was the selection of respondents on the basis of separation into those in the logistics industry and those not in the industry, the rest of the parameters were not controlled. The procedure for completing the questionnaires was that the tests were completed at a ten-minute interval. The time for completing the questionnaires was limited as recommended by the authors. A total of 60 people participated in the study, and they were evenly divided into a control group and a research group. In the study, the independent variable is the level of stress intensity while the dependent variable is the level of job burnout, to this should also be included a categorical variable for employees in the logistics and transportation management industry and manual workers unrelated to this industry. What is noteworthy is that the employees taking part in the research came from the SME sector.

5. Research results

The collected data from the empirical study was statistically analyzed using the *Jamovi* program. Below (figure 1, figure 2) will be presented from the *Perceived Stress Scale* in the form of sten for a better illustration of the results obtained.

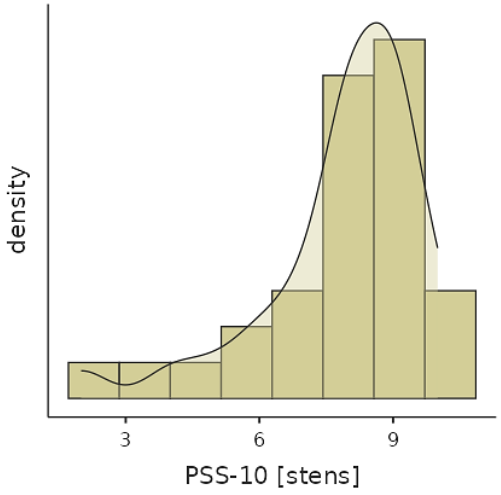

Figure 1. Histogram of the density of PPS-10 scores in the research group.

Source: own elaboration based on *Jamovi.*

As can be seen in the chart, the majority of respondents experience stress at the level of 6 to 8 sten, for the fact that in the case of this tool States of one to 3 indicate a low level of stress, stages 4 to 7 an average level of stress and stages 8 to 10 a high level of stress it can be clearly seen that the majority of respondents in the study group experience a medium to high level of stress with a clear trend towards higher values. This confirms hypothesis one, according to which employees in the logistics and transportation management industry will manifest high

levels of stress. The arrangement of the histogram, on the other hand, indicates a negative skewed distribution, which is decidedly asymmetric will increase the concentration of results on higher values, i.e. those corresponding to higher levels of stress. At the same time, it should be noted that the distribution of the results is not normal and is negatively skewed, which, in addition to the distribution of the density curve, is also confirmed by the Shapiro-Wilk test result of 0.832 (so $p < 0.001$).

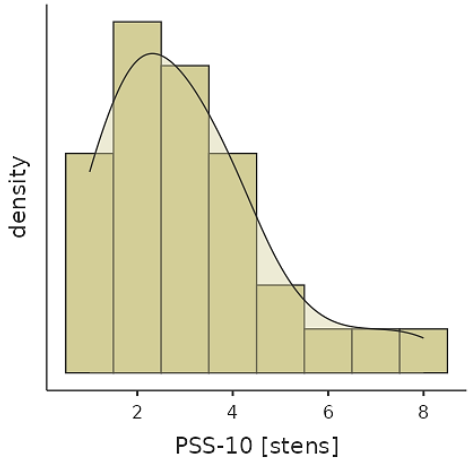

Figure 2. Histogram of the density of PPS-10 scores in the control group.

Source: own compilation based on *Jamovi*.

The histogram showing the results of the control group, on the other hand, shows that this group is primarily dominated by those experiencing low levels of stress, which also supports hypothesis one. The opposite trend can be observed here, which clearly indicates that the effect observed in the study group is the result of the procedure used. The results are complementary when examining the intensity of stress. As for the distribution, it is right skewed as shown not only by the histogram, but also by the result of the Shapiro-Wilk test, which is 0.893 ($p < 0.001$), meaning that the distribution is asymmetric with a clear trend. n addition to reinforcing hypothesis one, this may also provide a rationale for the conclusion that manual workers experience relatively low levels of stress. On the other hand, the results of the LBQ questionnaire will be considered slightly differently, because in this case, in order to find high levels of job burnout, it is necessary to find high scores on at least 3 of the 4 scales of this complex phenomenon. Therefore, as a simplification, this article will use a variable categorizing into low medium and high burnout. That is, if the person surveyed manifests 3 or 4 low sten scores for each scale, this will be included as a low level of job burnout, and similarly in the case of 3 or 4 This will be understood as a high level of job burnout. As part of the categorization in the following considerations, the level of low burnout will take the value of one average value of 2 and high burnout will take the value of 3. The remaining cases will be treated as medium level. At the same time, it should be emphasized that this is not equivalent to the state scale used for the first tool, since those are standardized and comparable for the entire population, and these represent a kind of statistical categorization. The following shows the results obtained in this respect (figure 3, figure 4, table 1, table 2).

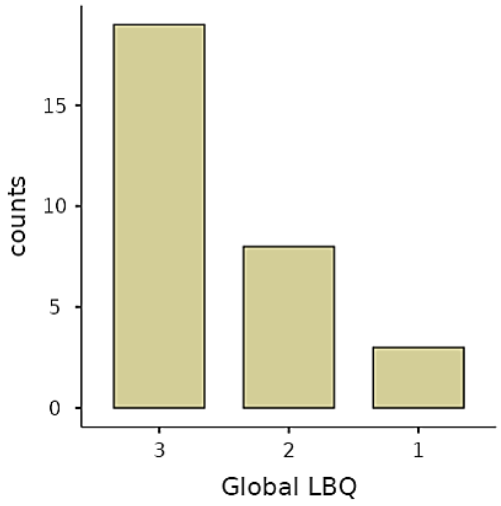

Figure 3. Graph with LBQ summary results for the research group.

Source: own elaboration based on *Jamovi.*

Table 1.
Global LBQ frequencies in the research group

Global LBQ	Quantities	% of the total	% accumulated
3	19	63.3%	63.3%
2	8	26.7%	90.0%
1	3	10.0%	100.0%

Source: own elaboration based on *Jamovi.*

Figure 3 shows that high levels of job burnout were most often observed among the study group. More than 60 percent of employees of representatives of the logistics industry, i.e. the majority according to the frequency table, show a high level of job burnout which confirms hypothesis two and suggests that there is a significant problem in this group. The results clarify quite homogeneously and provide an important premise for further analysis in this regard.

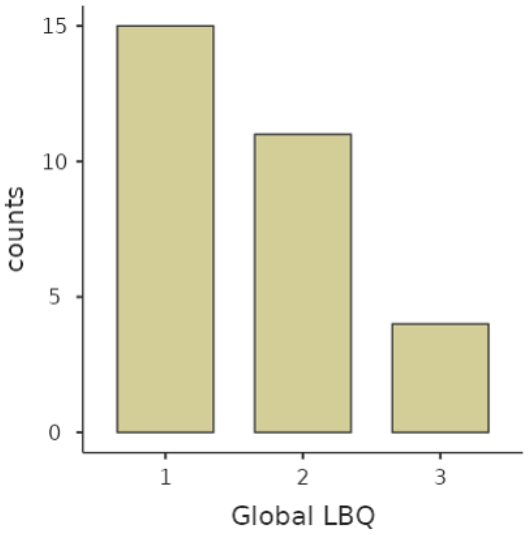

Figure 4. Graph with LBQ summary results for the control group.

Source: own elaboration based on *Jamovi.*

Table 2.
Global LBQ frequencies in the control group

Global LBQ	Quantities	% of the total	% accumulated
1	15	50.0%	50.0%
2	11	36.7%	86.7%
3	4	13.3%	100.0%

Source: own elaboration based on *Jamovi.*

Figure 4 on the other hand, shows an inverse relationship in the control group and, more specifically, the level of burnout among manual workers is overwhelmingly low. This is also confirmed in Table 2. of the frequency of categorized LBG, where the vast majority of the Respondents manifested a low or medium level of professional burnout. The results obtained in the control group using the questionnaire used reinforce the confirmation of hypothesis two. It seems that the control group, due to specific working conditions, is not as exposed to the risk of burnout. This could also be an interesting premise for further research. Below on the following graphs that is, on the fifth and sixth will be presented box plots which in turn will show whether hypothesis three is right.

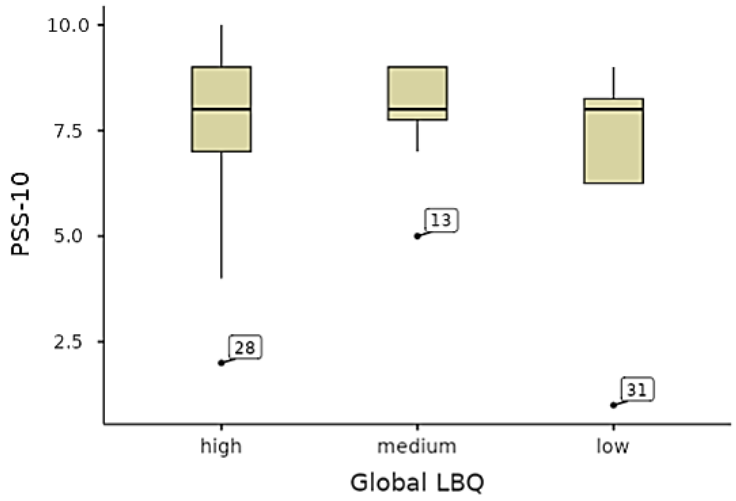

Figure 5. PSS-10 box plot for global LBQ in the research group.
Source: own elaboration based on *Jamovi.*

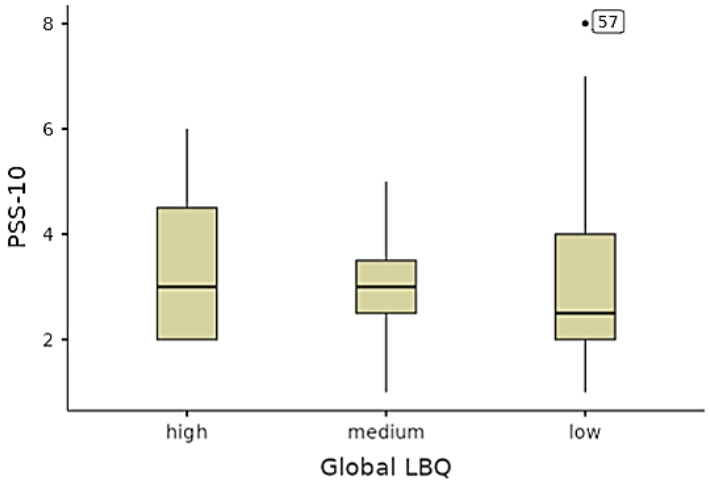

Figure 6. PSS-10 box plot for global LBQ in the control group.

Source: own elaboration based on *Jamovi.*

The box plot, the graph corresponding to the sixth graph, shows that those with high occupational burnout experience the highest level of perceived stress in addition to that their median stress score is high, and the scatterplot shows that most of them also have high stress. Based on this, it can be concluded that there is an actual trend that the higher the occupational burnout, the higher the level of perceived stress for those in the logistics industry. As for the sixth chart, there those with high job burnout experience medium or low levels of stress. These box plots show that there is a consistent relationship between burnout and stress in both groups, but the scale of stress in the research group is much higher. In order to complete the results and have confidence in them below in table three descriptive statistics were presented, for this a one-way non-parametric ANOVA was performed for both groups in table four, and then these results were compared pairwise using the DSCF method.

Table 3.
Descriptive satellites for the study and control group

Research group										
Descriptive statistics		N	M	SD	K	SEk	S	SEs	W	p
Global LBQ wobec PSS-10	high	19	8	2.10	2.19	1.01	-1.47	0.524	0.848	0.006
	medium	8	8.00	1.36	2.57	1.48	-1.54	0.752	0.809	0.036
	low	4	8.00	3.70	3.71	2.62	-1.90	1.01	0.737	0.029
Control group										
Descriptive statistics		N	M	SD	K	SEk	S	SEs	W	p
Global LBQ wobec PSS-10	high	4	3	1.19	-1.29	2.62	0.855	1.01	0.863	0.272
	medium	11	3.00	1.22	-0.109	1.28	-0.196	0.661	0.912	0.255
	low	14	2.50	2.13	0.702	1.15	1.19	0.597	0.859	0.029

Source: own elaboration based on *Jamovi.*

The table with descriptive statistics provides information that the research group is dominated by positive kurtosis and negative skewness, which indicates that the data is clustered at higher values, while the control group has negative kurtosis and less significant skewness, which suggests that the distributions are more dispersed and symmetrical. From the third table

itself, one can infer indirectly the existence of a relationship. It can be read from it that in the group of employees from the logistics industry indeed this level of stress is higher and also that they actually also have a higher level of job burnout. Taking into account the p-value and the Shapiro-Wilk test in both the control and research groups, it should be borne in mind that most distributions are not normal. Therefore, checking the relationship must be done on the basis of a non-parametric statistical test, in the case of this research it is the Kruskal-Wallis test shown below.

Table 4.
One-factor nonparametric ANOVA for both groups

Test Kruskal-Wallis						
	Research group			Control group		
	X^2	df	p	X^2	df	p
PSS-10	6.498	2	0.03	6.151	2	0.04

Source: own elaboration based on *Jamovi.*

Due to the fact that there is no normal distribution, it was necessary to check with the Kruskal-Wallis test whether there are statistically significant differences in the distributions of the dependent variable of the level of stress in the two groups.

Table 5.
Pairwise comparison by the method of DSCF

Pairwise comparisons – PSS-10					
		Research group		Control group	
		W	p	W	p
high	medium	1.389	0.005	1.345	0.004
high	low	1.236	0.003	1.879	0.003
medium	low	1.245	0.004	1.732	0.004

Source: own elaboration based on *Jamovi.*

Analyzing the results from the one-factor ANOVA and pairwise comparison, significant conclusions can be drawn first. Kruskal-Wallis test showed that the result in the research group and the control group is statistically significant ($p < 0.05$). On the other hand, a pairwise comparison of the results with post-hoc tests showed that in all 3 comparisons between pairs in the research group and the control group, statistically significant differences were found in the level of burnout in relation to perceived stress. Based on this, a general conclusion can be made regarding the statistical significance of the studies conducted that in both groups, a significant proxy for the level of professional burnout is the level of stress. Thus, all 3 stated hypotheses were confirmed.

6. Discussion

The empirical research conducted in this work on stress and burnout in the logistics and transportation management industry provided important insights in this regard. First, it was found that there are very high levels of stress among employees in this industry. Secondly, this group is also characterized by high levels of perceived burnout. And finally, the study shows that the higher the level of perceived stress, the higher the level of job burnout among supply chain workers as well. In the literature, one could find considerations of stress or job burnout, but so far the study and mutual correlation in this sector have not been investigated. What is important is that even despite such a small sample, the results of the study were statistically significant. That is, based on them, it can be assumed with a high degree of certainty that there is such a general trend in the logistics industry as a whole.

The literature on the subject highlighted the complex dynamics and quite exhaustive nature of this industry, this research is an important complement to this from the studies you could learn that work in the logistics sector is exhausting imposes very high pressure and is quite difficult due to which the workload of employees is significant (Lara-Calle, Prado, 2023) and that the stress that occurs there can have destructive effects (Ramlawati, 2019) and finally that the aforementioned stress leads in the long term to a decrease in employee motivation and commitment (Yener et al., 2014) This also made us assume that the level of job burnout due to the stress there may be high, and to what extent these phenomena may interact. It seems, therefore, that the results from this article are not only consistent with what can be found in other articles on the subject, but also send an alarming message, as the problem of stress and burnout in logistics must be somewhat downplayed if their levels are so high. This provides very important lessons for further research explorations in this area.

The conclusion of this article is clear the level of stress intensity in the group of employees associated with the logistics and transportation management industry is high, job burnout is also high. In addition, it is also known that stress is an important predictor of job burnout, as there is a relationship between these variables identified in this research. Indeed, the higher the level of perceived stress in logistics workers, the proportionally higher the level of job burnout in them. As was said at the beginning, it is very possible that this is influenced by some kind of specificity related to the challenges faced by employees in this industry (Fruscione et al., 2024). Therefore, it is important to develop methods of such stress management logistics to minimize the risk of professional burnout as much as possible, and this issue should be given due attention in scientific studies.

7. Summary

Identifying the intensity of stress levels and the intensity of job burnout levels and their possible correlation with each other in the logistics and transportation management industry was the utilitarian goal of this article. Taking into account the discourse of scientists, emphasizing the fact of high workload in this industry, as well as struggling with stress, the possibility of stress-related problems or job burnout in this group was taken into account. Based on the literature, it was hypothesized that the level of stress in the logistics industry will be high that the level of job burnout will be high, and that there is a relationship between the two in that the higher the level of stress, the higher the job burnout in the group. To test these hypotheses, a questionnaire study was conducted using the PPS-10 and LBQ measuring stress and job burnout, respectively, in two groups on 60 people in the SME sector. The first was the target group, or research group, were representatives but employees from the logistics and transportation management industry, and the control group were blue-collar workers not associated with the industry. The collected data were analyzed in detail statistically and eventually confirmed all three hypotheses. The results obtained in the work can be useful both in the context of human resource management before logistics and in the psychology of work and can contribute to the reflection on the question of how to properly manage stress among logistics employees so as not to lead to their professional burnout. Practical implications mainly focus on the need to develop methods for coping with stress and occupational burnout and their implementation in the logistics environment. For this purpose, certain methods and tools can be used, such as, for example, mindfulness, mindfulness meditation, wellness programs or EAPs (De Simone, Vargas, Servillo, 2021). This certainly provides an important rationale for further research, as well as for using the information obtained to develop methods and strategies to manage stress and counteract burnout.

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