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FACTORS OF WORKER HEALTH CONTROL AND IT SUPPORT IN MANAGEMENT AND USE OF AGRICULTURAL MECHANISM TO REDUCE RISK OF INJURIES AT WORK

Mila Popović [1*], Mrđan Čolović[2], Svetozar Đuranović[3], Dejan Sredojević[4], Ivan Arnautović[5], Marko Popović[6], Dragana Popović[7]

[1]University of Novi Sad, Faculty of Medicine in Novi Sad, Republic of Serbia*
[2]Academy of Business Economics, Čačak, Republic of Serbia
[3]Clinical Center of Vojvodina, Republic of Serbia
[4,7]High School of Modern Business, Belgrade, Republic of Serbia
[5]Faculty of Organizational Studies of Education, Belgrade, Republic of Serbia
[6,7]University of Novi Sad, Faculty of Economics, Subotica, Republic of Serbia

Abstract: Evaluation by owners and top management of medium-sized agricultural enterprises based on the influence of factors such as prevention factors based on noise and negative effects on the health of workers caused by the vibration of agricultural equipment in operation. It was found that there is a significant difference $p<0.0005$* in the evaluation of the IT system that serves the business of agricultural machinery by analyzing the factors: not submitting a report on the systematic review of workers, with submission, frequency of systematic review, additional health treatment of workers at the company's expense, the impact of agricultural equipment on the hearing of workers as well as the impact of vibrations on workers, i.e. treatment of workers in stationary institutions at the expense of the company. The innovative support of the IT system contributes to reducing the risk of injuries at work for all analyzed factors, which can affect the health status of workers in the work of medium-sized agricultural enterprises in terms of the use of agricultural equipment.

Keywords: *IT supports system, agricultural technology, risk.*

*Corresponding Author. E-mail: popovicmila1201@gmail.com
ORCID NUMBER: 0009-0007-8426-0246

INTRODUCTION

The standard performance of the main activity depends on the action of several management factors, which is of great importance in the work of medium-sized agricultural enterprises that actually operate with agricultural and other equipment [1-6].

Business operations within the main agricultural activity for which agricultural enterprises were established depend on the correctness, maintenance and other factors affecting agricultural equipment, which are the subject of analysis by owners and top managers who make management decisions by decision makers [7-11].

Monitoring of main agricultural equipment as a means of performing activities is not the only monitoring and subject of analysis [12-17].

In addition, there are influences such as control factors that are often supported by IT work within the overall management activity, both in the core and in the business of additional management activities [18-22].

Reducing the risk to the health of workers who operate daily agricultural machines refers to numerous influencing factors, among which the noise and vibration factors that occur in the operation of agricultural equipment have a strong influence, to which decision-makers must react in order to minimize the negative impact on the worker's ability to work [23-28].

MATERIAL AND WORK METHODS

In the paper, the authors used a survey conducted among 133 medium-sized agricultural enterprises, of which 56 entities used a standard IT support system in their business and 77 entities used a new or innovative IT system in their regular operations. The difference between these two systems was that the innovative system automatically delivers a report that includes important data on the health of workers and damage to agricultural equipment used in the business.

The survey was conducted from February 10 to March 10, 2026, and was completed by owners and managers, with a possible rating interval of 1-10, with the lowest reliability being rated 1 and the highest 10. 6 individual factors were analyzed, namely: operating without submitting reports on the health status of employees to top management, reporting on systematic examination of employees, frequency of systematic examination of employees, payment of additional costs for the treatment of employees by the company, the impact of noise and vibration of agricultural equipment on the health of workers, additional treatment of employees in spas whose costs are covered by the company, and their results.

All this was observed in the evaluation of top management and owners, taking into account all 6 factors according to the management assessment. The goal of such activities was to primarily reveal the potential impact of direct impact factors such as noise that can damage workers' hearing, but also the impact of vibrations in the operation of agricultural equipment, which would in the future serve as a basis for adopting risk reduction measures based on the use of agricultural equipment in the operation of medium-sized agricultural enterprises.

Statistical processing and data analysis were performed using IBM SPSS Statistical Package of Social Science version 25 software.

The t test was applied in the paper with the aim of determining the differences in the performance of two IT support systems in the correlation analysis of health factors that can affect the use of agricultural machinery in real business.

A level of 0.05 was used for the threshold value of significance.

RESEARCH RESULTS AND DISCUSSIONS

The results of the first part show the influence of the analyzed factors with a focus on the impact of noise and vibration of agricultural equipment operated by workers in the operations of medium-sized agricultural enterprises in relation to the type of IT support system used.

A t-test was used to examine differences in the use of IT support system.

The obtained results are shown in Table 1.

Table 1. Presentation of the evaluation of top management, i.e. the impact of worker health factors on agricultural equipment business

	Standard IT N=56	Innovative IT N=77	t	p
	Average value			
Without submitting a systematic review report	1.30 ± 0.46	2.14 ± 0.50	-9.782	<0.0005*
Report on the systematic examination of workers	1.51 ± 0.50	2.85 ± 0.50	-15.100	<0.0005*
Frequency of systematic review	2.33 ±0.76	4.59 ± 0.79	-16.344	<0.0005*
Additional treatment of workers at the company's expense	2.75 ± 1.35	5.72 ± 0.44	-15.860	<0.0005*
Noise and vibration of agricultural equipment	3.33 ± 0.76	5.27 ± 0.44	-16.842	<0.0005*
Treatment of workers in spas at the company's expense	4.42 ± 0.80	7.85 ± 0.50	-28.073	<0.0005*
Overall evaluation	2.61 ± 0.60	4.74 ± 0.14	-25.713	<0.0005*

Based on the results of the t test shown in Table 1, it can be seen that there are significant differences for all the individual analyzed health factors as well as their overall score per business in relation to the use of the IT support system impact model, where the use of innovative IT support systems has a significantly higher evaluation score for all factors compared to the use of standard IT support systems according to the manager's assessment.

The best-rated factor for the innovative IT support system is the treatment of workers in spas at the company's expense, while the worst-rated factor is not providing a report on the systematic examination of workers.

The results of the second part show the influence of worker health factors in relation to the used form of the IT support system.

Table 2. Presentation of the evaluation based on the damage caused to co-used agricultural equipment through the influence of health factors

	Standard IT N=56	Innovative IT N=77	t	p
	Average value			
Without submitting a systematic review report	5.39 ± 0.82	3.72 ± 0.44	13.719	<0.0005*
Report on the systematic examination of workers	3.87 ± 0.68	2.51 ± 0.82	10.325	<0.0005*
Frequency of systematic review	2.33 ± 0.76	1.81 ± 0.73	3.922	<0.0005*
Additional treatment of workers at the company's expense	2.42 ± 0.91	1.62 ± 0.48	6.013	<0.0005*
Noise and vibration of agricultural equipment	1.57 ± 0.59	1.31 ± 0.46	2.705	<0.0005*
Treatment of workers in spas at the company's expense	1.69 ± 0.46	1.32 ± 0.47	4.521	<0.0005*
Overall evaluation	2.88 ± 0.49	2.05 ± 0.30	11.199	<0.0005*

Based on the results of the t-test presented in Table 2, it can be seen that there are significant differences for all individual factors as well as the overall assessment of the impact of the analyzed factors on the working ability of workers who use agricultural equipment daily in relation to the use of forms of IT support systems.

In addition, the innovative IT support system has a significantly lower value for all analyzed factors compared to the use of a standard IT support system for agricultural equipment.

This indicates that the innovative support system provides a lower risk for workers who use agricultural equipment, which is especially visible in the factors of noise and vibration that arise when working with agricultural equipment used by workers in their business.

CONCLUSION

The study confirmed that there are two visible differences in the operations of medium-sized agricultural enterprises in the Republic of Serbia. First, in terms of the trust of owners and senior managers of medium-sized agricultural enterprises in the use of equipment and the existence of a significant impact on the health of workers $p<0.0005^*$ in the case of the standard and innovative IT support model. Second, the innovative IT support system has a strong impact on reducing risks in all analyzed factors, as significant differences are visible $p<0.0005^*$ compared to the standard form of support. This also applies to the noise and vibration factor suffered by workers in the operation of agricultural equipment of medium-sized agricultural enterprises. The study essentially drew attention to the importance of monitoring numerous factors from the point of view of their possible impact on risk reduction in the use of agricultural equipment in the operations of medium-sized agricultural enterprises in the Republic of Serbia.

Conflict of Interest

None is declared

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FAKTORI KONTROLE ZDRAVLJA RADNIKA I IT PODRŠKE KOD UPRAVLJANJA I UPOTREBE POLJOPRIVREDNE MEHANIZACIJE ZBOG SMANJENJA RIZIKA OD POVREDA NA RADU

Mila Popović[1], Mrđan Čolović[2], Svetozar Đuranović[3], Dejan Sredojević[4], Ivan Arnautović[5], Marko Popović[6], Dragana Popović[7]

[1]Univerzitet u Novom Sadu, Medicinski Fakultet u Novom Sadu, Republika Srbija
[2]Akademija za poslovnu ekonomiju, Čačak, Republika Srbija
[3]Klinički centar Vojvodine, Republika Srbija
[4,]Visoka škola modernog biznisa, Beograd, Republika Srbija
[5]Fakultet organizacionih studija EDUKA, Beograd, Republika Srbija
[6,7]Univerzitet u Novom Sadu, Ekonomski Fakultet Subotica, Republika Srbija

Apstrakt: Vrednovanje od strane vlasnika i top menadžmenta srednjih poljoprivrednih preduzeća po osnovu uticaja faktora kao što su faktori prevencije po osnovu buke i negativnosti po zdravlje radnika koje nastaju vibracijom poljoprivredne opreme u radu. Ustanovljeno je da postoji bitna razlika $p<0.0005$* u vrednovanju IT sistema koji opslužuje poslovanje poljoprivredne mehanizacije analizom faktora:
ne podnošenja izveštaja o sistematskom pregledu radnika, sa podnošenjem izveštaja, učestalosti sistematskog pregleda, dodatnog zdravstvenog tretmana radnika o trošku preduzeća, uticaja poljoprivredne opreme na čulo sluha radnika kao i uticaju vibracija iste na radnike, odnosno lečenja radnika u stacionarnim ustanovama na teret preduzeća.
Inovativna podrška IT sistema doprinosi smanjivanju rizika od povreda na radu za sve analizirane faktore, koji mogu uticati na zdravstveno stanje radnika u radu srednjih poljoprivrednih preduzeća po pitanju upotrebe poljoprivredne opreme.

Ključne reči: *IT sistem podrške, poljoprivredna tehnika, rizik.*

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