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The Role of Workers' Intentions for the Effectiveness of Ergonomic Interventions

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Abstract: Persisting pain complaints experienced by palm oil workers caused by manual material handling activities can be alleviated with an ergonomics intervention. However, its effectiveness greatly depends on workers' acceptance, whether to accept or reject the ergonomic programs. This study examines workers' intention to accept ergonomic interventions based on reason action theory and technology acceptance models. Other factors influencing workers' acceptance, namely perceived usefulness, ease of use, and trust, are also considered. The participants are workers on the process production in several palm oil mills in North Sumatra Province. The data were then modeled using Partial Least Squares Structural Equation Modeling and were analyzed using WarpPLS 3.0 – a data analyzing software. The correlation between perceived usefulness, ease of use, and trust towards ergonomics intervention was hypothesized to be fully mediated by workers' intention. The novelty of this research is the consideration of workers' perceptions to implement the ergonomics program effectively. The result shows that workers' intentions are significant enough to predict the effectiveness of ergonomics intervention ($\beta = 0.193$). However, workers' intention only partially mediates the correlation between perceived usefulness ($\beta = 0.063$) and perceived trust ($\beta = 0.063$) toward ergonomic intervention. It does not significantly mediate the correlation between perceived ease of use and ergonomic intervention ($\beta = 0.039$; $p=0.063$).

Keywords: perceived usefulness, perceived ease of use, perceived trust, workers' intentions, ergonomics intervention.

工人意图对人体工程学干预有效性的作用

摘要: 可以通过人体工程学干预来缓解棕榈油工人因手动材料处理活动而引起的持续疼痛。然而，它的有效性在很大程度上取决于工人的接受程度，是接受还是拒绝人体工程学程序。本研究基于理性行为理论和技术接受模型，考察了工人接受人体工程学干预的意愿。影响员工接受度的其他因素，即感知有用性,易用性和信任，也被考虑在内。参与者是北苏门答腊省几家棕榈油厂的流程生产工人。然后使用偏最小二乘结构方程建模对数据进行建模，并使用数据分析软件扭曲 PLS 3.0 进行分析。感知有用性,易用性和对人体工程学干预的信任之间的相关性被假设为完全由工人的意图调节。这项研究的新颖之处在于考虑了工人对有效实施人体工程学计划的看法。结果表明，工人的意图足以预测人体工程学干预的有效性（$\beta = 0.193$）。然而，工人的意图仅部分调节了对人体工程学干预的感知有用性（$\beta = 0.063$）和感知信任（$\beta = 0.063$）之间的相关性。它没有显着调节感知易用性和人体工程学干预之间的相关性（$\beta = 0.039$; 磷= 0.063）。

关键词: 感知有用性, 感知易用性, 感知信任, 工人意图,人体工程学干预。

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1. Introduction

Palm oil mills have the potential to grow big, such that they may be able to meet national energy needs and replace the use of fossil fuels completely. Such manual material handling activities still exist in some palm oil mills, and the most common activities are lifting, lowering, pushing, pulling, or carrying something [1]. For example, the process of moving fresh fruit bunches at the boiling station using a thresher machine must be assisted by workers to smoothen the production process. Sorting fresh fruit bunches and organizing boiling activities at the loading ramp and sterilizer stations and other activities are performed manually. Performing such manual work may cause workers to develop pain complaints after some time, so the work system must be improved. Severe pain experienced by workers indicates a strong relationship between the physical workload, work intensity, and ergonomic problems [2]. Supposedly, pain complaints can be alleviated using ergonomic program intervention, but workers have not fully accepted it yet. The reason may be due to a study stating that ergonomic intervention program does not improve workability. Instead, it reduces workability [3].

This study focuses on the role of the workers' intention in an ergonomics intervention in palm oil mills. Ergonomics intervention is one way to solve the problem of worker pain complaints. An ergonomics program means the implementation of technology in organizational systems to improve working conditions. Thus, ergonomics intervention can prevent injuries and increase company productivity. However, the ergonomics intervention should involve all relevant parties and be adjusted to risk factors in the workplace [4]. Active participation from workers is a prerequisite for successfully implementing ergonomics intervention to solve the problem. However, workers' perceptions toward intervention programs will influence their participation.

Nevertheless, ergonomic intervention programs have been implemented without considering their opinions. Workers' perceptions will affect the workers' intention, which will become the mediator between perceptions and the actions taken. Perceived usefulness, perceived ease of use, and perceived trust are factors that directly influence people's intentions to use technology [5]. Changes in workers' behaviors will occur in case of a continuous intention to utilizing something offered [6].

Previous studies on ergonomics intervention have included worker intention as a factor in utilizing technology to handle worker pain complaints. However, research on the effectiveness of technology acceptance, which is greatly influenced by workers' perceptions, has never been discussed, especially in palm oil mills. Hence, how workers accept the ergonomic intervention program is still unknown. Meanwhile, several previous studies have stated that perceived usefulness, ease of use, and trust are predictors of intention to behave [7]. However, studies have also found that perceived ease of use has the weakest effect on intention. Thus, understanding workers' perceptions and intentions are important to make workers willing to participate in an ergonomics program.

In particular, this study contributes to the field of ergonomics in three ways. Firstly, this study proposes a model that simultaneously displays perceived usefulness, ease of use, trust, workers' intention, and ergonomics intervention obtained by integrating findings from previous studies. This study will examine whether workers' perceptions affect intention in accepting ergonomics intervention. Secondly, this study will investigate whether workers' intention affects the success of ergonomics intervention. Thirdly, this study explores workers' intention as a mediator in its correlation between perception and effective ergonomic intervention programs.

This study uses the theory of reason action (TRA) [8] and the technology acceptance model version 3 (TAM3) [9] as their basis to explain that workers' perceptions influence the effective ergonomic intervention program through workers' intention. TRA aims to understand the voluntary behavior of workers who are highly dependent on intention. Attitudes and intentions are the basis for a person to act. Therefore, the decision to act is based on the expected result obtained from that action. This complies with TAM3, which states a causal relation between workers' perceptions of the applied technology and the action. It means that it is possible to predict whether workers' intentions will be involved in ergonomics intervention before implementing the technology. Thus, we assume that workers' perceptions of ergonomics intervention will affect the intention formed and increase the likelihood of an action being performed. When workers believe in the benefits of a soon-to-be-applied technology, workers' intentions will arise, and they will be willing to use it.

An ergonomic intervention program is a strategy of implementing technology designed to change the behavior of a population with the hope of improving health status. Intervention can be in the form of training programs, improving work facilities, or health promotion campaigns. Changes in behavior will not occur immediately without treatment given to a population, such as workers in palm oil mills. The readiness of workers to accept changes is critical to the success of implementing an ergonomics intervention. Therefore, our hypotheses are H1: Perceived usefulness, perceived ease of use, and perceived trust will positively affect workers' intention.

The intention is a plan to perform a certain behavior, thus affecting the action someone will take. The intention is shaped by an attitude towards an action to be taken and also by the trust. Awareness, initial

trust, compatibility, and possible risk may become obstacles in intention shaping and affect behavior. Workers' intention is an important element and closely related to behavior. Hence it can be used to predict or even change behavior [10]. In short, the intention is a predictor that influences behavior the most. With the help of a positive attitude and support from other people, the perception will strongly influence the intention to behave a certain way. Attitude towards behavior will influence intention.

Consequently, when someone positively appreciates an action, that person will have the willpower to perform that action. It means the more positive someone's attitude towards something, the stronger his intention willpower to perform that action. Understanding factors that influence workers' acceptance towards effective ergonomics interventions help reducing resistance that may occur during the program implementation. Therefore, our hypothesis is, H2: Workers' intention positively affects effective ergonomics intervention.

This study model places workers' intention as an intervening variable between perception against ergonomics intervention. TAM3 states a correlation between perception and action - this statement is supported empirically by previous studies. Workers' perceptions will influence intention in adopting technology that will be implemented [11]. TRA states that intention is a major psychological predictor of behavior, so the action will be performed if viewed as positive. In conclusion, workers' intention plays a decisive role, i.e., as an intermediary between perceived usefulness, ease of use, and perceived trust with acceptance of ergonomics intervention. Workers who perceive that the ergonomics intervention help improves performance will grow their intention to accept and implement the ergonomics intervention.

Workers' intention mediates the positive correlation between perception with ergonomics intervention because it is uncertain that workers will accept it. Although the acceptance of ergonomics interventions is preceded by intention formation, not every intent will be realized into an action. This fact is determined by the difference in intention intensity level, namely goal intent, target intent, and implementation intent [12]. Goal intent, which is more abstract and general, is formed first and followed by the more concrete and procedural implementation intent. Goal intent affects various ways to achieve the desired goal, though it does not guarantee that it can be achieved effectively.

Meanwhile, implementation intent is someone's aim to initiate behavior directed at a goal when he/she encounters a certain situation, allowing that person to translate his/her intention into action. For this reason, although there exists a strong intention commitment to make workers accept ergonomics interventions, implementation intent is still needed [13]. To date, no study places workstation as a mediator in the correlation between perception with worker acceptance of ergonomics interventions in palm oil mills. Based on this consideration, the conceptual framework model in this study includes three perceptions of workers, and workers' intention differently mediates the correlation between perceived usefulness, perceived ease of use, perceived trust, and ergonomics intervention. Therefore, our hypothesis is, H3: workers' intention positively mediates the correlation between perceived usefulness, perceived ease of use, perceived trust with the effective ergonomics intervention.

2. Material and Method

2.1. Participants

This study was conducted in 20 palm oil mills in North Sumatra Province, located in 14 different districts, and randomly selected. The population is workers in palm oil mills, namely at loading ramp stations, sterilizing stations, threshing stations, pressing stations, kernelly stations, and clarification stations. The next step was administering 300 questionnaires, consisting of demographic information and 58 question items on a Likert scale. There were 280 (93.33%) participants who fully participated during the data collection process. The data obtained show that all participants are male (100%), have a diploma and undergraduate degree (13.57%), or have a lower education level (86.43%). Workers were around 18 to 55 years old, with a mean of 37.94 years (SD = 10.06). Meanwhile, the years of service range from 1 to over 10 years (SD = 37.43).

2.2. Measures

This study uses a quantitative approach to collecting and analyzing data. The questionnaire used a five-point Likert scale to measure perceived usefulness, perceived ease of use, perceived trust, workers' intention, and ergonomics intervention, ranging from strongly disagree (1) to strongly agree (5). The researcher explained the objectives of the study and the relevant ergonomics terms to the participants. The questionnaire used in this study has constructs adapted from previous studies, i.e., exogenous constructs are perceived usefulness, perceived ease of use, perceived trust, and endogenous constructs are workers' intention and ergonomics intervention.

Perceived usefulness is measured by indicators of punctuality and results inaccuracy, which consists of four questions [14]. An example of a statement for timeliness indicator is "I feel the benefit of the ergonomics intervention in accelerating my work," and an example of a statement for accuracy indicator is "I feel the benefits of the ergonomics intervention in giving better results". The measurement results in perceived usefulness receiving a high scale of reliability (Cronbach's alpha = 92.4). Perceived ease of use is measured by indicators of convenience and suitability, which consist of three questions [15]. An example of a statement for ease of operation indicator

is “I feel that the ergonomics intervention makes my work easier,” and an example of a statement for suitability is “I feel the ergonomics intervention reduces fatigue”. The measurement results in perceived ease of use receiving a high scale of reliability (Cronbach’s alpha = 91.1). Perceived trust is measured by indicators of experience and satisfaction, which consist of three questions [16]. An example of a statement for experience indicator is “I believe that an ergonomics intervention will work best for my interests,” and an example of a statement for satisfaction is “I believe that management is competent in their area of expertise”. The measurement results in perceived trust receiving a high scale of reliability (Cronbach’s alpha = 85.5).

Workers’ intention is measured by indicators of benefit and involvement, which consist of four questions [17]. An example of a statement for a benefit indicator is “I intend to be involved in an ergonomics intervention because it benefits my work,” and an example of a statement for an engagement indicator is “I intend to be involved in an ergonomics intervention because it will be rewarded”. The measurement results showed workers’ intention receiving a good scale of reliability (Cronbach’s alpha = 91.6). Effective ergonomics interventions are measured by indicators of work safety, work comfort, work quality, and productivity, which consists of 4 questions [18]. An example of a statement for work safety is “In doing my job, I always pay attention to work safety”; an example of statement for work comfort is “My work productivity is greatly influenced by workplace comfort”; an example of statement for work quality is “I always prioritize work quality in achieving productivity”; an example of statement for productivity is “I feel confident that an ergonomics intervention will increase productivity”. The measurement results in ergonomics intervention receiving good scale reliability (Cronbach’s alpha = 92.9).

3. Results

3.1. Data Analyzes

Partial Least Squares Structural Equation Modeling (PLS-SEM) with WarpPLS3.0 software was used to analyze the variables of this study simultaneously [19]. The relevance of the proposed conceptual framework model, namely variables perceived usefulness, perceived ease of use, perceived trust, and workers’ intention toward effective ergonomics intervention, was then identified using that software. Next was simultaneously performing measurement model test and structural model test. Measurement model tests will prove the validity and reliability of constructs through convergent validity and discriminant validity.

3.1.1. Convergent Validity

The measurement model's convergent validity test is based on the factor loading value of the indicator and the average variance extracted (AVE) value. The correlation between a variable and its indicators is called a loading value. Perceived usefulness, perceived ease of use, perceived trust, workers’ intention, and ergonomics intervention are reflective variables, so their loading values must be greater than 0.7, and their p-significant value must be less than 0.05. The loading factor values, CA, AVE, and CR of each construct indicator satisfy the validity and reliability requirements as listed in Table 1. The overall CA value is greater than 0.6, while the AVE value and the overall CR value are greater than 0.7.

Table 1 Validity testing based on factor loading and average variance extracted (AVE) and reliability testing based on composite reliability (CR)

Variables	Indicators	Factor Loadings	Cronbach’s alpha (α)	AVE	CR
PU	PU1	0.922	0.924	0.814	0.946
	PU2	0.868			
	PU3	0.912			
	PU4	0.906			
PEOU	PEOU1	0.939	0.911	0.849	0.944
	PEOU2	0.933			
	PEOU3	0.891			
TST	TST1	0.856	0.855	0.775	0.912
	TST2	0.904			
	TST3	0.881			
W-INT	W-INT1	0.912	0.916	0.799	0.941
	W-INT2	0.884			
	W-INT3	0.894			
	W-INT4	0.885			
Erg-ITV	Erg-ITV1	0.918	0.929	0.824	0.949
	Erg-ITV2	0.881			
	Erg-ITV3	0.918			
	Erg-ITV4	0.913			

Note: PU = perceived usefulness; PEOU = perceived ease of use; TST = perceived trust; W-INT = workers’ intention; Erg-ITV = ergonomic interventions; AVE = average variance extracted; CR = composite reliability

3.1.2. Discriminant Validity

The discriminant validity test using the Fornell-Larcker approach shows that the square root of AVE is higher than the correlation between other latent variables. Table 2 shows that the discriminant validity of the perceived usefulness construct is 0.902 greater than 0.505, 0.471, 0.543, and 0.566. Likewise, the discriminant validity for the perceived ease of use, perceived trust, workers’ intention, and ergonomics intervention variables, which means that the condition for discriminant validity is met.

Table 2 Correlation among variables and the square root of AVE

Variables	PU	PEOU	TST	W-INT	Erg-ITV
PU	(0.902)				
PEOU	0.505	(0.921)			
TST	0.471	0.493	(0.880)		

W-INT	0.543	0.555	0.558	(0.894)	
Erg-ITV	0.566	0.598	0.565	0.615	(0.908)

Note: AVE's square root is the number in parentheses.

3.1.3. Hypotheses Testing Results

The theoretical correlation between exogenous variables and endogenous variables through mediator variables was tested using path analysis. The significance of the direct effect of perceived usefulness, ease of use, perceived trust toward workers' intention was tested through H1. Meanwhile, the direct effect of workers' intention on ergonomics intervention was tested through H2. The mediating role of workers' intention was also tested through H3.

The result of hypothesis testing, which can be seen in Table 3, shows that all three perceptions can significantly predict workers' intentions and ergonomics intervention. As well, workers' intentions can significantly predict effective ergonomics intervention. It can also be seen how workers' intention mediates the correlation between perceived usefulness, trust, and ergonomics intervention. However, workers' intention does not significantly mediate the correlation between perceived ease of use and effective ergonomics intervention (β=0.039), where the p-value is greater than 0.5.

Table 3 Result of hypothesis testing

Hypothesis	**Path coefficient**	**p-value**	**Supported?**
H1: PU → W-INT	0.325	< 0.001*	Yes
PEOU → W-INT	0.203		Yes
TST → W-INT	0.327		Yes
H2: W-INT → Erg-ITV	0.193	0.006*	Yes
H3: PU→W-INT→Erg-ITV	0.063	0.014*	Yes
PEOU→W-INT→Erg-ITV	0.039	0.063	No
TST→W-INT→Erg-ITV	0.063	0.026*	Yes

The mediation effect H3 was used to analyze the model in Figure 1. The correlation between perceived usefulness, ease of use, perceived trust toward effective ergonomics intervention was hypothesized to be fully mediated by workers' intention. The model was estimated using the PLS regression algorithm and resampling bootstrapping method.

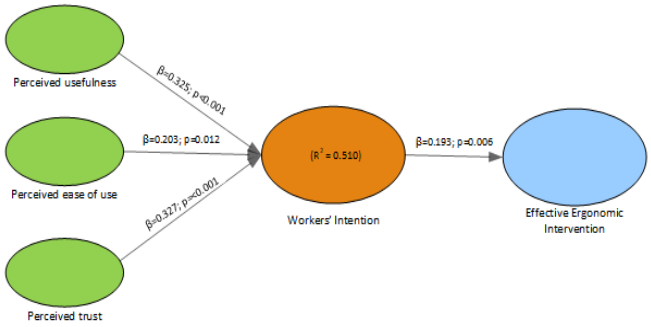

Fig. 1 The partial mediational model with standardized coefficients

The application of the indirect effect model shows that the results for all three show a decrease in the path coefficient value, yet still significant enough except for perceived ease of use toward ergonomics intervention with a p-value of 0.063. Thus, workers' intention partially mediates the relationship between perceived usefulness and perceived trust toward effective ergonomics intervention.

Perceived usefulness, ease of use, and trust contributed simultaneously to workers' intention with an R-squared value of 0.510, which means that all perceptions together can influence intention by 51%. The model shown in Figure 1 has predictive relevance with the Q^2 value on workers' intention of 0.506> 0

4. Discussion

This study explores the correlation between perceived usefulness, ease of use, trust, workers' intention, and the effectiveness of ergonomics intervention in palm oil mills to alleviate pain complaints experienced by workers. The tests conducted were direct and indirect correlations between workers' perception, intention, and ergonomics intervention. In this study, workers' intention plays a role as a mediator for the correlation between perceived usefulness, ease of use, perceived trust, and ergonomics intervention. Thus, the testing was also conducted on workers' intentions. Many studies have already examined the correlation between workers' perception and workers' intention and the correlation between workers' intention and the effectiveness of ergonomics intervention. However, there are no studies on the correlation between perceived usefulness, ease of use, perceived trust, and ergonomics intervention mediated by workers' intentions.

The test result shows that perceived usefulness, ease of use, and trust positively affect workers' intentions. Likewise, workers' intention affects the effectiveness of ergonomics intervention. However, some test results do not support the proposed hypothesis because workers' intention does not fully mediate the program effectiveness. Apparently, workers' intention only mediates some variables, i.e., it mediates the correlation between perceived usefulness and perceived trust with ergonomics intervention. Workers' intention

does not mediate the correlation between perceived ease of use and ergonomics intervention, as it is not statistically significant.

Additionally, no significant correlation between perceived ease of use and behavior was found in previous studies. The insignificant correlation between the intention to use technology and the behavior that arises is caused by habitual behavior. Workers' intention is not strong enough to move perceived ease of use to achieve the effectiveness of ergonomics intervention.

A significant contribution from this study is informing that workers' intention acts as a mediator in the correlation between perceived usefulness and perceived trust on the effectiveness of ergonomics intervention in palm oil mills. This is crucial since workers' perception has never been considered previously. The first empirical attempt is another substantial factor contributing to the correlation between perceived usefulness, ease of use, perceived trust, workers' intention, and effective ergonomics intervention in the mediation model. While previous studies only considered workers' intention in achieving the effectiveness of ergonomics intervention.

Ergonomics intervention is a complex process, as it aims to improve work conditions in palm oil mills, thus affecting the life quality of the workers. Comprehensive implementation of intervention accompanied by proper monitoring will achieve the desired results. So far, ergonomics intervention tends to focus on physical changes and work processes, even though workers are critical success factors. Management commitment and genuine employee participation greatly affect the success of implementing the intervention [20]. Because workers are an organization's most valuable asset, optimizing workers' actions will improve organization performance. Therefore, many aspects need to be reckoned properly before changing the system, work processes, procedures, and facilities. Successfully implementing ergonomics intervention in palm oil mills will improve workers' performance since they can work painlessly and more comfortably [21]. A successful ergonomics intervention will allow workers to work painlessly to be more comfortable and able to impact performance improvement.

Management of palm oil mills must pay greater attention to intentions due to the close correlation between workers' intentions and effective ergonomics intervention. Workers' intention is the intention in a person's heart to do something. Workers willing to be involved in various ergonomics programs implemented in the palm oil industry contribute to the effectiveness of ergonomics intervention. Their willingness to be involved will help facilitate intervention since they better understanding the processes happening on the production floor. The perceived usefulness, ease of use, and perceived trust of workers will improve during adoption duration - when workers interact with intervention, they have a chance to evaluate their first perception, which will form their intention. The correlation between workers' perception towards intention and behavior has already received empirical support from previous studies [11]. After a certain length of time, workers' decision to adopt or reject ergonomics intervention is formed.

Perceived usefulness is strongly influenced by workers' belief that the use of new technologies introduced by ergonomics programs will improve job performance [22]. Thus, the perceived usefulness strengthened by intention causes workers to be willing to get involved. This is the role of intention that encourages a certain behavior to arise for the effectiveness of ergonomics intervention in palm oil mills. A perceived trust also influences workers' intention to use a certain technology. Workers who believe in the benefits of ergonomics programs in palm oil mills will help form an intention to be actively involved. Perceived trust is strongly influenced by workers' experience, i.e., ergonomics programs implemented previously. Workers will be willing to implement the program, follow the stated schedule and rules, share their experiences, coordinate in workgroups, etc. Such active participation from workers will contribute to the effectiveness of ergonomics intervention. The higher the perceived trust level of workers towards technology, the larger workers' intention to be involved [5], [15].

Meanwhile, perceived ease of use is the perception of workers that leads to the belief that the technology adopted does not require much effort. Workers who think ergonomics program eases work will form their intention and cause a changed in behavior. However, this study finds that workers' intention does not significantly mediate the correlation between perceived ease of use and the effectiveness of ergonomics intervention. Although perceived ease of use influences intention, this workers' intention is not strong enough to make workers participate in ergonomics programs. The most probable reason is that workers' intention is still at the goal intent and has not reached the implementation intent. The intention to behave strongly correlates with action, though not all intentions will turn into action. Some behaviors are either not implemented or adapted to a change in circumstances. The gap that exists between intention and behavior can be approached with implementation intentions. Establishing an implementation intent means that people have to lay the foundation to achieve their goals. This implementation intent clarifies the time, place, and way to act, which becomes an effective intervention to monitor the expected behavior [23]. Workers can use implementation intent as an 'if-then' plan to translate intent into action. This approach helps to close the gap in behavioral intent and is proven effective in turning intent into action [24].

Workers tend to use technology that they believe will help them complete the job. The intensity of use and interaction of workers with the technology may indicate the ease of use. Despite using a technology that brings a great advantage in alleviating pain complaints, it must be easy to use. Technology that is used often implies that the technology is more familiar and easier to use. This can serve as a guideline for the technology that the ergonomics program will introduce

5. Conclusion

This study reveals a way to understand the effectiveness of ergonomics intervention on the production floor. For the time being, an ergonomics program is the most appropriate and effective approach to alleviate pain complaints experienced by workers. The success of the intervention is strongly influenced by a program that can be implemented integrated, and all organizational components actively participate in it. However, so far, the workers as the executor of the ergonomics program on the production floor have not been specifically studied. Workers' perceptions will greatly affect the effectiveness of ergonomics interventions. Workers' perceptions will influence the intention formed, which eventually will make them willing to accept and use the newly introduced technology. Therefore, it is necessary to consider workers' perceived usefulness, ease of use, and perceived trust in the technology used. The ergonomic intervention will be successful only if workers possess positive intent to behave as desired. The workers' behavior formed marks the effectiveness of ergonomics intervention.

The limitations of this study are in examining perceived usefulness, perceived ease of use, and perceived trust related to the effectiveness of ergonomic interventions. The implication of the results of this study is to achieve the effectiveness of ergonomic interventions in palm oil mills by understanding workers' perceptions regarding the technology applied.

References

[1] LUAN H. D. *et al.* Musculoskeletal Disorders: Prevalence and Associated Factors Among District Hospital Nurses in Haiphong, Vietnam. *BioMed Research International*, 2018, 1–9. https://www.hindawi.com/journals/bmri/2018/3162564/

[2] WAMI S. D., ABERE G., DESSIE A., and GETACHEW D. Work-Related Risk Factors and The Prevalence of Low Back Pain Among Low Wage Workers: Results from a Cross-sectional Study. *BMC Public Health*, 2019, 19(1):1-9. https://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-019-7430-9

[3] GUPTA N., WÅHLIN-JACOBSEN C. D., ABILDGAARD J. S., HENRIKSEN L. N., NIELSEN K., and HOLTERMANN A. Effectiveness of A Participatory Physical and Psychosocial Intervention to Balance The Demands and Resources of Industrial Workers: A Cluster-Randomized Controlled Trial. *Scandinavian Journal of Work, Environment & Health*, 2018, 44(1):58–68. https://www.jstor.org/stable/44709302

[4] DEHGHAN N., AGHILINEJAD M., NASSIRI-KASHANI M. H., AMIRI Z., and TALEBI A. The Effect of A Multifaceted Ergonomic Intervention Program on Reducing Musculoskeletal Disorders in Dentists. *Medical Journal of the Islamic Republic of Iran*, 2016, 30(1). https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5419222

[5] RAMOS F. L., FERREIRA J. B., DE FREITAS A. S., and RODRIGUES J. W. The Effect of Trust in The Intention to Use M-Banking. *Brazilian Business Review,* 2018,15(2):175–191. http://bbronline.com.br/index.php/bbr/article/view/26

[6] KABIR M. A., SAIDIN S. Z., and AHMI A. A Conceptual Framework on The Influence of Perceived Usefulness, Perceived Ease Use and Computer Self-Efficacy on The Intention to Use Electronic Collection System in Nigerian Federal Hospitals. *International Journal of Management Research and Review*, 2017, 7(3):259–266. https://aidi-ahmi.com/download/publication/ 2017_IJMRR_kabir_saidin_ahmi.pdf

[7] MOKSNESS L. and OLSEN S. O. Trust Versus Perceived Quality in Scholarly Publishing: A Personality-Attitude-Intention Approach. *College & Research Libraries*, 2018, 79(5): 671–684.https://crl.acrl.org/index.php/crl/article/view/16768

[8] AJZEN I. and MADDEN T. J. Prediction of Goal-Directed Behavior: Attitudes, Intentions, and Perceived Behavioral Control. *Journal of Experimental Social Psychology,* 1986, 22(5): 453–474. https://www.sciencedirect.com/science/article/abs/pii/0022103186900454?via%3Dihub

[9] VENKATESH V. and BALA H. Technology Acceptance Model 3 and A Research Agenda on Interventions. *Decision Sciences Journal*, 2008, 39(2): 273–315. https://onlinelibrary.wiley.com/doi/10.1111/j.1540-5915.2008.00192.x

[10] BALAU M. Exploring The Link Between Intention and Behavior in Consumer Research. *EIRP Proceedings*, 2018, 13: 134–141. http://www.proceedings.univ-danubius.ro/index.php/eirp/ article/ view/1864/2200

[11] RABAA 'I A. A. Extending The Technology Acceptance Model (TAM) to Assess Students' Behavioural Intentions to Adopt An E-Learning System: The Case of Moodle as A Learning Tool. *Journal of Emerging Trends in Engineering and Applied Sciences*, 2016, 7(1): 13–30. https://online-journals.org/index.php/i-jet/article/view/9732

[12] VAN GELDEREN M., KAUTONEN T., WINCENT J., and BINIARI M. Implementation Intentions in The Entrepreneurial Process: Concept, Empirical Findings, and Research Agenda, *Small Business Economics*, 2018, 51(4): 923–941. https://link.springer.com/article/10.1007%2Fs11187-017-9971-6

[13] KONEFKA D. S., SCHUMACHER D. J., BAKER K. H., CHARNIN J. E., and GOLLWITZER P. M. Changing Physician Behavior with Implementation Intentions: Closing The Gap Between Intentions and Actions. *Academic Medicine.*, 2016, 91(9):1211–1216. https://pubmed.ncbi.nlm.nih.gov/27008360

[14] BAKER-EVELETH L. and STONE R. W. Usability, Expectation, Confirmation, and Continuance

Intentions to Use Electronic Textbooks. *Behaviour & Information Technology*, 2015, 34(10): 992–1004. https://www.tandfonline.com/doi/full/10.1080/0144929X.2015.1039061
[15] DACHYAR M. and BANJARNAHOR L. Factors Influencing Purchase Intention Towards Consumer-To-Consumer E-Commerce. *Intangible Capital*, 2017, 13(5): 946–966. https://www.intangiblecapital.org/index.php/ic/article/view/1119/672
[16] MCKNIGHT D. H., CHOUDHURY V., and KACMAR C. Developing and Validating Trust Measures for E-Commerce: An Integrative Typology. *Information Systems Research*, 2002, 13(3): 334–359. https://pubsonline.informs.org/doi/abs/10.1287/isre.13.3.334.81
[17] ALI F., RYU K., and HUSSAIN K. Influence of Experiences on Memories, Satisfaction and Behavioral Intentions: A Study of Creative Tourism. *Journal of Travel and Tours*, 2016, 33(1): 85–100. https://www.tandfonline.com/doi/full/10.1080/10548408.2015.1038418
[18] KALKIS H. and ROJA Z. Strategic Model for Ergonomics Implementation in Operations Management, *Journal of Ergonomics*, 2016, 6(4) :1–5. https://www.longdom.org/open-access/strategic-model-for-ergonomics-implementation-in-operations-management-2165-7556-1000173.pdf
[19] HAIR J. F., BLACK W. C., BABIN B. J., and ANDERSON R. E. *Multivariate Data Analysis*. London: Seventh Ed., 2014: 16(1). https://www.pearson.com/uk/educators/higher-education-educators/program/Hair-Multivariate-Data-Analysis-Global-Edition-7th-Edition/PGM916641.html
[20] LIMERICK R. B. Participatory Ergonomics: Evidence and Implementation Lessons. *Applied. Ergonomics*, 2018, 68: 289–293. https://www.sciencedirect.com/science/article/pii/S0003687017302740?via%3Dihub
[21] RASMUSSEN C. D. N. *et al.*, Improving Work for The Body - A Participatory Ergonomic Intervention Aiming at Reducing Physical Exertion and Musculoskeletal Pain Among Childcare Workers (The TOY-Project): Study Protocol for A Wait-List Cluster-Randomized Controlled Trial. *Trials*, 2018, 19(1):1–14. https://trialsjournal.biomedcentral.com/articles/10.1186/s13063-018-2788-z
[22] TAHAR A., RIYADH H. A., SOFYANI H., and PURNOMO W. E. Perceived Ease of Use, Perceived Usefulness, Perceived Security and Intention to Use E-Filing: The Role of Technology Readiness. *Journal of Asian Finance, Economics and Business*, 2020, 7(9): 537–547. http://koreascience.or.kr/article/JAKO202026061031385.page
[23] HAGGER M. S. *et al.* Implementation Intention And Planning Interventions in Health Psychology: Recommendations from The Synergy Expert Group For Research and Practice. *Psychology & Health*, 2016, 31(7): 814–839. https://www.tandfonline.com/doi/abs/10.1080/08870446.2016.1146719?journalCode=gpsh20
[24] DAVIES K., ARMITAGE C. J., LIN Y.-L., MUNRO J., WALSH T., and CALLERY P. Development of An Implementation Intention-Based Intervention to Change Children's and Parent-Carers' Behaviour. *Pilot Feasibility Studies*, 2018, 4(1): 1–9. https://pilotfeasibilitystudies.biomedcentral.com/articles/10.1186/s40814-017-0171-6

参考文:

[1] LUAN H. D. 等。肌肉骨骼疾病：越南海防地区医院护士的患病率和相关因素。国际生物医学研究，2018，1-9. https://www.hindawi.com/journals/bmri/2018/3162564/
[2] WAMI S. D., ABERE G., DESSIE A. 和 GETACHEW D. 与工作相关的风险因素和低薪工人腰痛的流行：横断面研究的结果。BMC 公共卫生，2019，19(1): 1-9. https://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-019-7430-9
[3] GUPTA N.,WÅHLIN-JACOBSEN CD,ABILDGAARD JS,HENRIKSEN LN,NIELSEN K. 和 HOLTERMANN A. 参与性身体和心理社会干预对平衡产业工人的需求和资源的有效性：集群随机对照试验.斯堪的纳维亚工作,环境与健康杂志，2018，44（1）：58-68。https://www.jstor.org/stable/44709302
[4] DEHGHAN N., AGHILINEJAD M., NASSIRI-KASHANI M. H., AMIRI Z. 和 TALEBI A. 多方面人体工程学干预计划对减少牙医肌肉骨骼疾病的影响。伊朗伊斯兰共和国医学杂志，2016，30(1)。https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5419222
[5] RAMOS F. L., FERREIRA J. B., DE FREITAS A. S. 和 RODRIGUES J. W. 信任对使用移动银行的意图的影响。巴西商业评论，2018, 15(2): 175–191。http://bbronline.com.br/index.php/bbr/article/view/26
[6] KABIR M. A., SAIDIN S. Z. 和 AHMI A. 感知有用性,感知易用性和计算机自我效能感对尼日利亚联邦医院使用电子采集系统意图的影响的概念框架。国际管理研究与评论杂志，2017 年，7(3)：259–266。https://aidi-ahmi.com/download/publication/2017_IJMRR_kabir_saidin_ahmi.pdf
[7] MOKSNESS L. 和 OLSEN S. O. 学术出版中的信任与感知质量：个性-态度-意图方法。大学与研究图书馆，2018 年，79(5)：671–684.https://crl.acrl.org/index.php/crl/article/view/16768
[8] AJZEN I. 和 MADDEN T. J. 目标导向行为的预测：态度,意图和感知行为控制。实验社会心理学杂志，1986，22（5）：453-474。https://www.sciencedirect.com/science/article/abs/pii/0022103186900454?via%3Dihub
[9] VENKATESH V. 和 BALA H. 技术接受模型 3 和干预研究议程。决策科学杂志，2008，39（2）：273–315。https://onlinelibrary.wiley.com/doi/10.1111/j.1540-5915.2008.00192.x
[10] BALAU M. 在消费者研究中探索意图和行为之间的联系。企业资源计划会议录，2018，13：134–141。http://www.proceedings.univ-danubius.ro/index.php/eirp/article/view/1864/2200
[11] RABAA 'I A. A. 扩展技术接受模型 (谭) 以评估学生采用电子学习系统的行为意图：表情包作为学习工具的案例。工程与应用科学新趋势杂志，2016，7(1)：13–30。https://online-journals.org/index.php/i-jet/article/view/9732
[12] VAN GELDEREN M., KAUTONEN T., WINCENT J.

和 BINIARI M. 创业过程中的实施意图：概念,实证结果和研究议程，小企业经济学，2018，51(4)：923–941. https://link.springer.com/article/10.1007%2Fs11187-017-9971-6
[13] KONEFKA D. S., SCHUMACHER D. J., BAKER K. H., CHARNIN J. E. 和 GOLLWITZER P. M. 用实施意图改变医生行为：缩小意图和行动之间的差距。学术医学，2016，91（9）：1211-1216。https://pubmed.ncbi.nlm.nih.gov/27008360
[14] BAKER-EVELETH L. 和 STONE R. W. 使用电子教科书的可用性,期望,确认和继续意图。行为与信息技术，2015，34(10)：992–1004。https://www.tandfonline.com/doi/full/10.1080/0144929X.2015.1039061
[15] DACHYAR M. 和 BANJARNAHOR L. 影响消费者对消费者电子商务购买意愿的因素。无形资本, 2017, 13(5): 946–966。https://www.intangiblecapital.org/index.php/ic/article/view/1119/672
[16] MCKNIGHT D. H., CHOUDHURY V. 和 KACMAR C. 为电子商务制定和验证信任措施：综合类型学。信息系统研究，2002, 13(3): 334–359。https://pubsonline.informs.org/doi/abs/10.1287/isre.13.3.334.81
[17] ALI F., RYU K. 和 HUSSAIN K. 经验对记忆,满意度和行为意图的影响：创意旅游研究。旅游杂志，2016，33（1）：85-100。https://www.tandfonline.com/doi/full/10.1080/10548408.2015.1038418
[18] KALKIS H. 和 ROJA Z. 运营管理中人机工程学实施的战略模型，人机工程学杂志，2016 年，6(4): 1-5。https://www.longdom.org/open-access/strategic-model-for-ergonomics-implementation-in-operations-management-2165-7556-1000173.pdf
[19] HAIR J. F., BLACK W. C., BABIN B. J. 和 ANDERSON R. E. 多变量数据分析。伦敦：第七版，2014 年：16(1)。https://www.pearson.com/uk/educations/higher-education-educators/program/Hair-Multivariate-Data-Analysis-Global-Edition-7th-Edition/PGM916641.html
[20] LIMERICK R. B. 参与式人体工程学：证据和实施课程。应用。人体工程学，2018，68：289-293。https://www.sciencedirect.com/science/article/pii/S0003687017302740?via%3Dihub
[21] RASMUSSEN C. D. N. 等，改善身体工作 - 旨在减少育儿工作者的体力消耗和肌肉骨骼疼痛的参与式人体工程学干预（玩具项目）：等待名单集群随机对照试验的研究方案。试验，2018 年，19（1）：1-14。https://trialsjournal.biomedcentral.com/articles/10.1186/s13063-018-2788-z
[22] TAHAR A., RIYADH H. A., SOFYANI H. 和 PURNOMO W. E. 感知易用性,感知有用性,感知安全性和使用电子归档的意图：技术准备的作用。亚洲金融,经济与商业杂志，2020，7(9)：537–547。http://koreascience.or.kr/article/JAKO202026061031385.page
[23] HAGGER M. S. 等。健康心理学中的实施意图和规划干预：来自协同研究和实践专家组的建议。心理学与健康，2016，31(7)：814–839。https://www.tandfonline.com/doi/abs/10.1080/08870446.2016.1146719?journalCode=gpsh20
[24] DAVIES K., ARMITAGE C.J., LIN Y.-L., MUNRO J., WALSH T. 和 CALLERY P. 开发一种基于实施意图的干预来改变儿童和家长照顾者的行为。试点可行性研究，2018，4(1)：1-9。https://pilotfeasibilitystudies.biomedcentral.com/articles/10.1186/s40814-017-0171-6