



How to cite this article:

Sabri, N. S. A. & Azli, M. K. M. (2025). The relationship between attitude, knowledge, and musculoskeletal disorder awareness among construction workers. *Social Security Management Journal*, 2(2), 1-10. <https://doi.org/10.32890/ssmj2025.2.2.1>

## **THE RELATIONSHIP BETWEEN ATTITUDE, KNOWLEDGE, AND MUSCULOSKELETAL DISORDER AWARENESS AMONG CONSTRUCTION WORKERS**

**<sup>1</sup>Nurul Syazwani Ahmad Sabri, <sup>2</sup>Mohamad Khuzaimi Mohamad Azli**

<sup>1</sup>School of Business Management,

<sup>2</sup>Master of Science Student, Occupational Safety and Health Management Program  
Universiti Utara Malaysia, Malaysia

*<sup>1</sup>Corresponding author: [n.syazwani.ahmad@uum.edu.my](mailto:n.syazwani.ahmad@uum.edu.my)*

Received: 1/7/2025

Revised: 15/8/2025

Accepted: 30/8/2025

Published: 28/10/2025

### **ABSTRACT**

Musculoskeletal disorders (MSDs) are one of the major causes of occupational injuries and reduced productivity in the construction sector. Despite various safety regulations and ergonomic guidelines, the level of awareness regarding MSDs among construction workers remains low. Many workers continue to underestimate the risks of repetitive movements, awkward postures, and heavy lifting, which contribute to the persistent rise of MSD cases in the construction sector. Therefore, this study is conducted with the intention to investigate factors that might influence MSD awareness. The study tested two independent variables namely, attitude and knowledge against MSD awareness. A total of 132 questionnaire was distributed to foreign workers with response rate of 100%. In this study, hypotheses for direct relationship were tested using multiple regression analyses. Results showed that both attitude and knowledge were not related to MSD awareness. Interestingly, this study indicating that having positive attitude and high knowledge on safety do not increase the awareness on MSD. These findings provide new insight on the issues of creating awareness towards MSD especially involving foreign workers. The question of why attitude and knowledge do not influence MSD awareness by foreign workers in construction sector provide opportunity for future research to reconcile these explanations. It also highlights the importance of engaging different and ongoing approach in educate and train foreign workers to increase awareness and reduce the incidence of MSDs in the high-risk construction industry. These efforts can contribute to a safer working environment, fewer injuries, and improved productivity across the sector.

**Keywords:** attitude, knowledge, musculoskeletal disorders (MSDs), foreign workers, construction.

## INTRODUCTION

Musculoskeletal disorders (MSDs) are among the most prevalent occupational health issues globally, affecting workers across various sectors including healthcare, manufacturing, and education. For example, a national study in China highlighted a high prevalence of MSDs among nurses, particularly in the lower back, neck, and shoulders, primarily due to prolonged standing, awkward postures, and patient handling tasks (Zhang et al., 2021). These findings illustrate that MSDs are not limited to physically intensive jobs but are widespread across occupations with varying ergonomic demands. Nevertheless, the risks are particularly intensified in labor-intensive industries like construction, where workers are exposed to physically demanding tasks, harsh environmental conditions, and inconsistent application of ergonomic practices (Kashif et al., 2022; Soares et al., 2020; Deros et al., 2010; Bureau of Labor Statistics, 2024; Odebiyi & Okafor, 2023; Rahman & Sakamoto, 2024). In the Malaysian context, these challenges are exacerbated by the fact that majority of construction workers are foreign labourers who often face language barriers, lack formal ergonomic training, and may be hesitant to report discomfort or injury due to job insecurity (Lee, 2023; Qureshi, 2023). The transient nature of construction employment, combined with limited enforcement of safety standards, contributes to low prioritization of long-term musculoskeletal health. This highlights the urgent need for targeted, culturally sensitive ergonomic interventions and policies that address both the physical and systemic vulnerabilities in this high-risk sector.

The construction industry is globally recognized for its "3D" characteristics—dirty, dangerous, and difficult—which demand strenuous physical labor in hazardous environments, often under conditions that increase the risk of work-related MSDs (Kashif et al., 2022; Rahman & Sakamoto, 2024). These demanding conditions frequently involve repetitive tasks, awkward postures, heavy lifting, and prolonged exposure to environmental stressors, all of which contribute to a high risk of work-related MSDs (Kashif et al., 2022; Rahman & Sakamoto, 2024). In Malaysia, the Department of Occupational Safety and Health (DOSH) consistently ranks construction as one of the highest-risk sectors for workplace accidents, with many incidents attributed to ergonomic hazards and MSDs (DOSH, 2021). In response, regulatory frameworks such as the Occupational Safety and Health Act (Amendment 2022) have been introduced to strengthen workplace safety. However, ergonomic issues remain under-emphasized in implementation due to systemic issues such as limited enforcement resources, a shortage of trained ergonomic personnel, and the absence of ergonomics as a standard component in routine site-level safety audits (Khairul Anwar, 2023). As noted by Selamat et al. (2021), many Malaysian employees remain unaware of ergonomic principles, and organizations often conflate ergonomics with basic safety compliance, leading to poor integration of ergonomic strategies into daily work practices. This persistent gap between policy and execution contributes to unsafe work practices and continued MSD exposure in manual labor-intensive settings like construction. As a result, musculoskeletal disorder cases continue to rise. The Department of Statistics Malaysia (DOSM) reported 678 MSD-related cases in 2022 and 696 in 2023. Yet these figures likely underestimate the true burden, as many cases, especially among foreign workers, go unreported due to fear of job loss or deportation (DOSM, 2023; Yusuf, 2014).

Several studies highlight that MSD awareness among construction workers remains inadequate. This issue is particularly pronounced among foreign labourers, who often have limited understanding of occupational risks and receive minimal safety training due to language barriers and job insecurity (Zulkefle & Sheikh Ali, 2023; Mohamad, 2021). However, Malaysian workers are not exempt from these challenges. Studies have shown that even local workers frequently lack structured ergonomic

education and may underestimate long-term musculoskeletal risks, especially in the absence of consistent training and supervision (Selamat et al., 2021). As a result, both groups may normalize discomfort and fail to recognize early symptoms of MSDs, which delays intervention. Moreover, ergonomic training is either irregular or absent at many worksites, reflecting a gap between safety policy and practical implementation (Liao et al., 2023).

Attitude is another crucial factor influencing workers' behavior toward MSD prevention. It encompasses an individual's beliefs, values, and emotional responses toward safety measures and risk perception. Workers with a positive safety attitude are more likely to comply with ergonomic guidelines, report symptoms early, and take proactive steps to prevent injury. Conversely, negative, or indifferent attitudes may lead to risk-taking behavior, pain normalization, and intervention resistance (Lu et al., 2022). In high-risk environments like construction, attitudes are shaped not only by personal beliefs but also by peer influence, supervisory practices, and the organization's overall safety culture (Ephraim-Emmanuel et al., 2019; Xia et al., 2020). Additionally, research suggests that older workers often demonstrate more cautious attitudes due to accumulated experience and previous injury exposure, while younger workers may exhibit overconfidence and lower risk perception (Park & Jeong, 2021; Gyekye & Salminen, 2009). Despite its importance, attitude remains a relatively underexplored construct in Malaysian construction settings, warranting closer examination in the context of MSD awareness.

Knowledge plays a vital role in influencing preventive behaviors. Evidence suggests that structured education such as ergonomic briefings and supervisor engagement, can enhance risk perception and reduce MSD incidence (Hussain et al., 2020; Van Eerd et al., 2022). However, such initiatives are still uncommon in Malaysian construction settings, weakening efforts to foster a preventive safety culture (Jaafar & Ahmad, 2023). Age may also shape how workers perceive and respond to ergonomic risks. Older workers tend to exhibit stronger risk awareness due to accumulated experience but may also face physical decline that increases vulnerability to injury (Park & Jeong, 2021). Conversely, younger workers are generally more physically capable but may underestimate risk or display overconfidence, leading to unsafe behaviors (Gyekye & Salminen, 2009).

Although international research supports these dynamics (Caffaro et al., 2022), Malaysian studies that examine the combined influence of knowledge and attitude on MSD awareness among construction workers remain limited. This is especially relevant given the demographic diversity of Malaysia's construction workforce, where many foreign workers may be unfamiliar with national safety standards (Said and Zulkefle, 2024). Therefore, this study aims to examine the relationship between knowledge, attitude, and MSD awareness among construction workers in Malaysia.

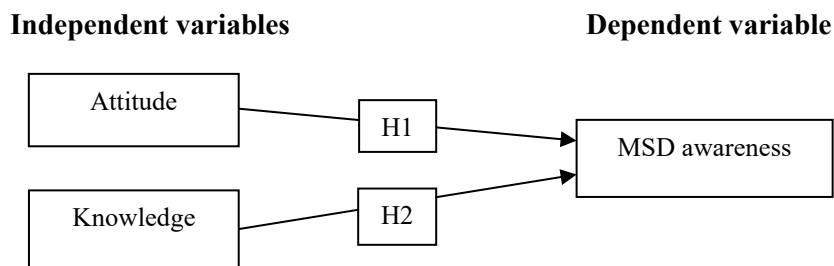
## **METHOD**

This study employed a quantitative method to examine the relationships between attitude, knowledge, and MSD awareness among foreign construction workers. A cross-sectional approach was chosen to obtain data at a single point in time, providing a snapshot of the respondents' awareness of MSDs. Quantitative methods were suitable as they allowed objective measurement and statistical analysis of the relationships among the study variables. The research was conducted at two construction sites in Kuala Lumpur, Malaysia. A total of 132 foreign construction workers who had worked at the sites for a minimum of six months was involved in the study.

The key variables in this study include attitude and knowledge as the independent variables, and MSD awareness as the dependent variable. Thus, two hypotheses were proposed: H1: There is a significant relationship between attitude and MSD awareness and H2: There is a significant relationship between knowledge and MSD awareness. These relationships are illustrated in Figure 1. The primary data were collected through the distribution of questionnaire. The questionnaire was divided into two parts, in which the first part gathered demographic information such as age, gender, nationality, job type, and work experience. The second section of the questionnaire consists of three adapted scales measuring attitude (14 items), knowledge (16 items), and MSD awareness (11 items), based on instruments originally developed by Nordin et al. (2018).

**Figure 1**

*Conceptual Framework*



A pilot study was conducted with 30 respondents to evaluate the internal reliability of the adapted instrument and to ensure its clarity and suitability for the target population. This preliminary step was important to confirm that the questionnaire items were understandable and appropriate for foreign construction workers. Cronbach's alpha values were 0.854 for knowledge, 0.763 for attitude, and 0.796 for MSD awareness, indicating acceptable reliability across all constructs. The actual data collection was carried out on-site, with questionnaires distributed during break time to minimize interference with work. Participants were briefed on the purpose of the study, and informed consent was obtained from each respondent before the data collection process. Data collected were analyzed using the Statistical Package for Social Sciences (SPSS) Version 29. Descriptive statistics were used to summarize respondent demographics, while multiple regression analysis assessed the relationships between attitude, knowledge, and MSD awareness.

## RESULTS

### Demographic Characteristics of the Participants

Table 1 presents the detailed descriptive statistics of the participants' demographic characteristics. The results indicate that 93.2% of participants in this survey were males. Out of 132 participants, 40.2% were age between 31 and 35 years. Majority of participants were from Bangladesh (69.7%). Most of the participants (41.7%) had a working experience between six to ten years. Finally, most of the participants (23.5%) do general work and others.

**Table 1**  
*Demographic Characteristics of the Participants (n=132)*

<b>Demographic</b>	<b>Frequency</b>	<b>Percentage</b>
<b>Gender</b>		
Male	123	93.2
Female	9	6.8
<b>Age</b>		
>20 years	0	0.0
21-25 years	4	3.0
26-30 years	38	28.8
31-35 years	53	40.2
36-40 years	31	23.5
>41 years	6	4.5
<b>Nationality</b>		
Bangladesh	92	69.7
Indonesia	32	24.2
Others	8	6.1
<b>Work Experience</b>		
1-5 years	31	23.5
6-10 years	55	41.7
11-15 years	37	28.0
>16 years	9	6.8
<b>Occupation</b>		
Carpenter	20	15.2
Steel fixer	28	21.2
Plasterer	26	19.7
Electrical work	5	3.8
Bricklayer	22	16.7
General work and others	31	23.5

### **Correlation Analysis**

Table 2 presents the means, standard deviations, and Pearson correlations of variables for the 132 participants. As shown in Table 2, there is significant positive relationship between attitude and MSD awareness ( $r = .174, p < .05$ ), suggesting that the higher the positive safety attitude, the higher the awareness towards MSD experienced by the participants. However, there was no significant relationship between knowledge and MSD awareness.

**Table 2**  
*Descriptive Statistics, and Correlations of Variables*

Variables	N	Mean	Std. Dev	1	2	3
1 Attitude	132	3.832	.078	1		
2 Knowledge	132	3.999	.157	.282**	1	
3 MSD Awareness	132	4.116	.618	.174*	.115	1

\*Correlation is significant at the 0.05 level (2-tailed)

\*\*Correlation is significant at the 0.01 level (2-tailed)

### Multiple Regression

As shown in Table 3, 3.5% ( $R^2 = 0.035$ ,  $F=23.117$ ,  $p<0.01$ ) of the variance in MSD awareness was significantly explained by attitude and knowledge. In the model, both attitude and knowledge were found not significant. Therefore, Hypotheses 1 and 2 were not supported. The results suggest that MSD awareness among foreign construction workers was not influence by positive safety attitude and knowledge.

**Table 3**  
*Multiple Regression Analysis*

Independent Variable	Dependent Variable (Awareness of MSDs) (Standardize coefficient) Beta	t	Significant (p)	Collinearity Statistics	
				Tolerance	VIF
Attitude	.154	1.712	.08	.920	1.087
Knowledge	.071	.789	.432	.920	1.087
F Value	2.345				
R <sup>2</sup>	.035				
Adjusted R <sup>2</sup>	.020				
Durbin Watson	1.979				

Note: \* $p<0.05$ , \*\* $p<0.01$

## DISCUSSION

### **Relationship Between Attitude and MSD Awareness**

In construction environment, having positive safety attitude is seen critical by the fact that construction sites are inherently high-risk environments. But interestingly, attitude was found not related to MSD awareness as expected and thus, not supported the hypothesis tested. Thus, the current finding does not support previous studies by Ephraim-Emmanuel et al. (2019) and Caffaro et al. (2022), which found that positive safety attitudes are associated with greater awareness and safer practices. They argued that attitude plays a crucial role in shaping how workers perceive and act upon potential hazards. To them, workers who value safety are more likely to observe guidelines, report early symptoms, and avoid risky behavior, even without supervision. This is further supported by Xia et al. (2020), who highlighted that attitude acts as an internal driver that motivates workers to self-regulate and engage in protective behavior.

One potential explanation for the lack of correlation between attitudes among foreign workers and MSD awareness in this study may be that the influence of attitude is constrained in environments where safety norms are weak or inadequately enforced. In such cases, even workers with a positive mindset may not be able to practice what they believe due to systemic constraints. The current findings indicate the need for a robust safety culture where organizational commitment, peer modelling, and supervisor reinforcement to be present to complement individual attitudes. As highlighted by Selamat et al. (2021), the lack of ergonomic integration at the site level in Malaysia further limits the ability of workers to act on their attitudes toward safety.

### **Relationship Between Knowledge and MSD Awareness**

It was predicted that knowledge would positively relate to MSD awareness, which in a sense that MSD awareness will increase when individuals have high knowledge on safety and health. However, the current findings prove the opposite. Surprisingly, in the context of foreign construction workers, knowledge does not increase MSD awareness. Thus, the present study does not support previous studies conducted by Jaafar and Ahmad (2023), Caffaro et al. (2022), and Rahat Hussain et al. (2020), where structured and targeted safety training enhances workers' ability to recognize ergonomic risks and respond appropriately. A possible explanation for the discrepancy may lie in how ergonomic knowledge is communicated. In Malaysian construction environments, the presence of foreign labourers with diverse linguistic and educational backgrounds can present barriers to effective knowledge transfer. This limits the likelihood that knowledge alone will be internalized or applied in practice.

Moreover, Van Eerd et al. (2022) argue that knowledge must be reinforced through repetitive and interactive learning formats for it to influence behavior. In the absence of consistent reinforcement, knowledge remains passive. This may explain why workers in this study demonstrated relatively high knowledge scores, yet this knowledge did not translate into higher awareness of MSDs. Therefore, training programs must move beyond simple information dissemination to include language-sensitive, practical, and scenario-based tools such as visual aids, participatory demonstrations, and regular toolbox meetings to enhance knowledge retention and application among workers with varied backgrounds.

### **Practical Implications**

The current findings offer several practical implications for safety practitioners and construction managers. Even though both attitude and knowledge are considered critical in creating awareness related to MSD, both are found not related when tested among foreign construction workers. Therefore, interventions that focus on improving foreign workers' attitudes and knowledge on safety and health must take into consideration the inclusivity and sensitivity of the working context, especially one that involve foreign workers who may face language barriers and limited formal education. Rahat Hussain et al. (2020) emphasized that training for migrant workers must be culturally and linguistically appropriate to ensure understanding and transfer of safety practices. Also, organizational support and peer influence play a critical role in sustaining positive safety attitudes. A strong safety culture supported by leadership commitment, clear protocols, and peer engagement has been shown to enhance safety compliance and awareness (Selamat et al., 2021; Van Eerd et al., 2022). These findings underline the importance of not only individual-level interventions but also systemic strategies to embed safety values into the organizational environment.

### **Limitations and Direction for Future Research**

This study has several limitations that should be acknowledged. First, the sample was limited to foreign construction workers from two sites in Malaysia, which may restrict the generalizability of the findings to the wider construction industry or local workers. Second, since this study adopting quantitative approach with cross-sectional design, this method offers limited information regarding why factors such as attitude and knowledge do not have any influence on MSD awareness. Perhaps, in the future, it may worth investigating the factors that contribute to MSD awareness using qualitative approach. Third, the data were collected through self-reported questionnaires, which may introduce social desirability bias, particularly in responses related to attitudes and safety behavior. Lastly, the study focused primarily on individual-level variables, without accounting for broader organizational and psychosocial factors such as management commitment, workplace safety climate, or peer influence, all of which may significantly shape workers' awareness and behavior. Thus, future research is needed to reconcile these explanations or to show that there are conditions in which MSD awareness can be increased especially among foreign construction workers.

### **CONCLUSION**

This study examines the influence of attitude and knowledge on MSD awareness among foreign construction workers. Though in past studies, both have empirically proven to be significantly important in creating MSD awareness, the current findings showed the opposite. In other words, MSD awareness among foreign construction workers was not contributed by their attitude and knowledge. These results highlight the importance of strengthening safety attitudes and delivering effective training strategies that engage foreign workers. The study contributes to ongoing efforts in occupational safety by offering insights into how individual and demographic factors interact to shape health and safety awareness in high-risk work environments.

### **ACKNOWLEDGMENT**

This research received no specific grant from any funding agency in the public, commercial, or not for profit sectors.

## REFERENCES

- Bureau of Labor Statistics. (2024, March 24). *Nonfatal injuries and illnesses resulting in days of job transfer or restriction, 1992–2022*. <https://www.bls.gov/opub/ted/2024/nonfatal-injuries-and-illnesses-resulting-in-days-of-job-transfer-or-restriction-1992-2022.htm>
- Caffaro, F., Roccatò, M., de Paolis, G., Cremasco, M. M., & Cavallo, E. (2022). Promoting farming sustainability: The effects of age, training, history of accidents and social-psychological variables on the adoption of on-farm safety behaviors. *Journal of Safety Research*, *80*, 371–379.
- Deros, B. M., Daruis, D. D. I., Ismail, A. R., Sawal, N. A. & Ghani, J. A. (2010). Work-Related Musculoskeletal Disorders among Workers' Performing Manual Material Handling Work in an Automotive Manufacturing Company. *American Journal of Applied Sciences*, *7*(8), 1087-1092. <https://doi.org/10.3844/ajassp.2010.1087.1092>
- Department of Occupational Safety and Health (DOSH). (2021). *Annual report: Occupational safety in construction sector*. Ministry of Human Resources Malaysia.
- Department of Statistics Malaysia (DOSM). (2023, March 24). *National occupational injury and disease statistics 2023*. <https://www.dosm.gov.my/portal-main/release-content/big-data-analytics-NOAS-2022>
- Department of Statistics Malaysia (DOSM). (2024, March 24). *National occupational injury and disease statistics 2023*. <https://www.dosm.gov.my/portal-main/release-content/big-data-analytics-national-occupational-injury-and-disease-statistics->
- Ephraim-Emmanuel, B. C., Ogbomade, R., Idumesaro, B. N., & Ugwoke, I. (2019). Knowledge, attitude and practice of preventing the occurrence of work-related musculoskeletal disorders among doctors in University of Port-Harcourt Teaching Hospital. *Journal of Medical Research and Innovation*, *3*(2), e000161.
- Gyekye, S. A., & Salminen, S. (2009). Age and workers' perceptions of workplace safety: A comparative study. *The International Journal of Aging and Human Development*, *68*(2), 171–184.
- Hussain, R., Pedro, A., Lee, D. Y., Pham, H. C., & Park, C. S. (2018). Impact of safety training and interventions on training-transfer: targeting migrant construction workers. *International Journal of Occupational Safety and Ergonomics*, *26*(2), 272–284. <https://doi.org/10.1080/10803548.2018.1465671>
- Jaafar, R., & Ahmad, M. A. I. (2023). The influences of occupational safety and health awareness factors among workers: A case study in a company in North Malaysia. *Journal of Techno-Social*, *15*(1), 98–104.
- Khairul Anwar, M. S. (2023). *Amendment to Occupational Safety and Health Act (OSHA): Relevant changes*. SSRN. <https://ssrn.com/abstract=4497209>
- Kashif, M., Albalwi, A., Raqib, A., Farooq, M., Ullah, R., Sakoor, M., & Kamran, Z. (2022). Work-related musculoskeletal disorders among Pakistani construction workers: Prevalence, characteristics, and associated risk factors. *Work*, *72*(1), 119–126.
- Lee, S. H. (2023). *Work-related musculoskeletal disorders among migrant construction workers: A study from Malaysia* [Master's thesis, Seoul National University]. S-Space.
- Liao, L., Liao, K., Wei, N., Ye, Y., Li, L., & Wu, Z. (2023). A holistic evaluation of ergonomics application in health, safety, and environment management research for construction workers. *Safety Science*, *165*, 106198. <https://doi.org/10.1016/j.ssci.2023.106198>

- Lu, M. L., Lowe, B. D., Howard, N. L., Meyers, A. R., Fox, R. R., Dong, R. G., & Baker, B. A. (2022). Work-related musculoskeletal disorders. In *Modern occupational diseases: Diagnosis, epidemiology, management and prevention* (pp. 287–353). Bentham Science Publishers.
- Mohamad, M. (2021). Thematic review on the safety and health measures of foreign workers in the construction sector in Malaysia. *Global Business and Management Research*, 13(4s), 983–999.
- Nordin, A. N., Rohani, J. M., Abidin, N. Z., Zein, R. M., & Zuki, A. A. M. (2018). Knowledge, attitude and practices of musculoskeletal disorder injuries from Malaysian industries employers' perspective. *International Journal of Engineering & Technology*, 7(3), 28–31.
- Odebiyi, D. O., & Okafor, U. A. C. (2023). Musculoskeletal disorders, workplace ergonomics and injury prevention. In Orhan K. (Ed). *Ergonomics—New insights*. IntechOpen. DOI: 10.5772/intechopen.106031
- Qureshi, M. O. (2023). *Occupational safety challenges among migrant construction workers in Hong Kong* [Doctoral dissertation, City University of Hong Kong]. Scholars Hub. <https://scholars.cityu.edu.hk/files/183412187/95800267.pdf>
- Rahman, M. S., & Sakamoto, J. (2024). The risk factors for the prevalence of work-related musculoskeletal disorders among construction workers: A review. *Journal of Applied Research on Industrial Engineering*, 11(2), 155–165.
- Selamat, M. N., Abd Aziz, S. F., Mukapit, M., Baker, R., & Jaaffar, A. H. (2021). The analysis of ergonomic task demand and psychosocial work factors towards occupational safety and health. *International Journal of Academic Research in Accounting, Finance and Management Sciences*, 11(3), 191–205.
- Soares, C. O., Pereira, B. F., Gomes, M. V. P., Marcondes, L. P., de Campos Gomes, F., & de Melo-Neto, J. S. (2020). Preventive factors against work-related musculoskeletal disorders: Narrative review. *Revista Brasileira de Medicina do Trabalho*, 17(3), 415 – 430. <https://doi.org/10.5327/z1679443520190360>
- Van Eerd, D., Irvin, E., Le Pouésard, M., Butt, A., & Nasir, K. (2022). Workplace musculoskeletal disorder prevention practices and experiences. *Inquiry: The Journal of Health Care Organization, Provision, and Financing*, 59, 00469580221092132. <https://doi.org/10.1177/00469580221092132>
- Waligóra, Ł. (2024). Exploring the impact of age diversity on organizational identification: A study of HR practices and perceived age discrimination climate. *Administrative Sciences*, 14(10), 243. <https://doi.org/10.3390/admsci14100243>
- Xia, N., Xie, Q., Hu, X., Wang, X., & Meng, H. (2020). A dual perspective on risk perception and its effect on safety behavior: A moderated mediation model of safety motivation, and supervisor's and coworkers' safety climate. *Accident Analysis & Prevention*, 134, 105350. <https://doi.org/10.1016/j.aap.2019.105350>
- Zhang, Y., Feng, X., Wu, S., Li, L., & Dai, J. (2021). The prevalence of musculoskeletal disorders and the associated risk factors in nurses: A systematic review. *International Journal of Nursing Studies*, 115, 103841. <https://doi.org/10.1016/j.ijnurstu.2024.104826>
- Zulkefle, S. R., & Sh Said, S.A.A. (2024). Construction health and safety implementation for the foreign workers in Malaysia. *Journal of Building Performance*, 14(1), 1-13.