Development Needs for Risk Assessment – A Case Study of Five Finnish Companies

Maria Lindholm, Minna Rantala, and Sari Tappura

Tampere University Tampere, 33014 Tampereen yliopisto, Finland

ABSTRACT

Occupational health and safety (OHS) risk assessment at work is vital for preventing accidents and injuries and fulfilling regulatory requirements. This study aims to add knowledge about the factors that affect risk assessment and the aspects of risk assessment that need to be developed in five large- and medium-sized Finnish companies. The qualitative research method was semi-structured interviews, which were analyzed and sorted into themes. The interviewees (n = 53) were either part of a risk assessment team or managers. The results indicate that the factors that affect risk assessment and need development are the risk assessment team, individuals' attitudes, experience and knowledge, resources, and communication. Further research is needed to focus specifically on these themes, study their relations with risk assessment in more depth, and develop effective intervention programs.

Keywords: Development, Hazard identification, Occupational health and safety, Prevention, Risk assessment, Risk evaluation

INTRODUCTION

Risk has multiple definitions (Aven, 2022), but two commonly used definitions present risk as 'a situation or event where something of human value (including humans themselves) is at stake and where the outcome is uncertain' (Rosa, 2003; Rosa, 1998) or as 'an uncertain consequence of an event or an activity with respect to something that humans value' (IRGC, 2005). Risk assessment consists of recognizing and identifying, analyzing, and evaluating the risks (ISO-31000:2018, 2018).

The prevention and early identification of risks promote occupational health and safety (OHS). Based on the Finnish OHS Act (23.8.2002/738, 2002) and European legislation (89/391/EEC, 1989), employers are responsible for ensuring their employees' health and safety, preventing occupational accidents and diseases, carrying out hazard identification, and eliminating hazards stemming from the work environment and the work itself. Hence, suitable and sufficient risk assessment, with effective use of the findings, is an integral part of OHS management (Gadd et al., 2004; Rydell et al., 2019).

The quality of risk assessments is affected by many factors, including hazard identification, the method and data used, the frequency and the consequence estimations, the initial assumptions, the risk assessment team,

resources, and consultation with and collaboration of the relevant stakeholders (Hrica and Eiter, 2020; Arunraj and Maiti, 2007; Pinto et al., 2013; Backlund and Hannu, 2002). In the literature, issues and mistakes have been recognized in conducting risk assessment in general and in OHS risk assessment. Incompleteness or inaccuracies in different risk assessment phases may lead to inappropriate results (Pinto et al.. 2013). The ability to identify hazards and strategies to control them vary (Bahn, 2013; Pandit et al., 2019). For example, psychosocial hazards, hazards due to exceptional circumstances, familiar and obvious hazards, and hazards of shared workplaces have been recognized as difficult to identify or manage (Nenonen et al., 2021). According to Jeelani et al. (2016), the reasons behind unrecognized hazards include selective attention or inattention to some of the hazard types, the potential hazard set being unknown, and a belief that particular hazards have low safety risk levels. The risk assessment team should include employees with practical knowledge and consultants to cover the relevant competencies needed and avoid biased results (Gadd et al., 2004; Pinto et al., 2013).

Risk matrices, which are commonly used in risk assessments, have received criticism. Ratings of the same hazard differ and can be opposite to each other based on the risk assessor conducting the assessment and are influenced by, for example, different worldviews and beliefs (Ball and Watt, 2013; Anthony Cox, 2008). On the other hand, the use of the risk matrices may also lead to identical ratings to quantitatively very different risks (Anthony Cox, 2008). The likelihood and consequence categories need quantitative or semi-quantitative definitions and guidance. Risk assessors should be trained and receive feedback about their assessments (Duijm, 2015). Finally, risk assessment should not be carried out to justify decisions already made (Gadd et al., 2004).

To reach the zero accident goal (ISSA, n.d.), prevent accidents and injuries, and fulfill regulatory requirements, risk assessment at work is vital. If risk assessment is conducted with an unfit method or otherwise inadequately, it may lead to ineffective safety prevention programs, inefficient use of resources, and criticism of risk assessment (Pinto et al., 2013). If decisions are based on incomplete or false results, significant sources of risks fail to be eliminated or reduced, which in turn leads to unsatisfactory safety levels (Bahn, 2012; Peace, 2017; Pinto et al., 2013). The many mistakes and issues in carrying out risk assessments indicate that risk assessments need to be improved and developed (Gadd et al., 2004). This study aims to add knowledge about the factors affecting OHS risk assessment and which aspects of OHS risk assessment need to be focused on in five Finnish companies.

MATERIALS AND METHODS

To identify factors affecting OHS risk assessment and the development needs of OHS risk assessment, semi-structured interviews (n = 41) (Gideon, 2012) were conducted during winter and spring 2021 in five companies. The companies represent manufacturing, electrical power generation, transmission, and distribution, transportation and storage, and other technical testing and analysis industries. Four companies are large, and one is medium-sized,

employing about 200 people. All except one of the companies have international operations or are part of larger international corporations. This study focuses on the companies' Finnish sites. These companies commonly use and apply checklists and risk matrices based on the framework and guidelines in the *Risk Assessment in Workplaces Workbook* published by the Finnish Ministry of Social Affairs and Health (2015).

The interviewees (n = 53) were either managers or part of a risk assessment team and comprised managers (n = 10), immediate supervisors (n = 15), employees (n = 20), and OHS managers or representatives (n = 8). All the interviews were conducted via Microsoft Teams as individual (n = 32) and group (n = 9) interviews. The average duration of an interview was 59 minutes (SD = 16). All the interviews were recorded except one, which the interviewee did not want recorded. The transcriptions resulted in 324 pages. In this study, the focus is on the following questions: What factors contribute to or weaken implementation of the risk assessment? What works or does not work in hazard and risk assessment? How should risk assessment be developed? What is the next step in risk assessment development?

The material was analyzed with Atlas.ti version 9 by applying the open-coding analysis approach, conceptualizing the written data into categories, and giving a name that represents the category (Strauss and Corbin, 1998). The coding was conducted by two researchers. After the preliminary coding, the researchers reassessed the material and the codes, removed unnecessary codes, and merged similar codes, resulting in 409 codes. The codes were then categorized into 104 themes with Whimsical SaaS. Because a single theme may contain more than one code, a particular theme may have more than one mention per interviewee. Questions that received clear and simple answers did not require thematic categorization and were processed numerically.

RESULTS

The analysis revealed that the risk assessment team's composition and activities, resources and preparation for risk assessment, individuals' attitudes, and experience and knowledge were the four most often mentioned themes, both contributing to and weakening the risk assessment implementation. The team's composition and activities referred, for example, to open communication, the importance of a competent risk assessor, the amount of participation in the risk assessment, and the number of participants in the risk assessment. Individuals' objective or subjective views, the level of understanding and knowledge about risk assessment and the assessed work and working conditions, becoming too accustomed, and their orientation and motivation were seen as either contributing to or weakening implementation of the risk assessment. In addition, having enough time to prepare for and conduct a risk assessment, clear instructions, and formal work plans to follow were seen as contributing to the risk assessment. Finally, OHS software did not provide enough guidance during the risk assessment, or the risk assessor did not know how to use all the options in the software.

Regarding plans and models for risk assessment, the interviewees were satisfied that they have them and that the models cover the risk assessment

phases well. Yearly plans, risk assessment forms, and lists ensure that the risk assessments are done similarly regardless of the assessor or the work site. The answers related to composition and activities of the team revealed that the interviewees were happy with their teams and felt that they are motivated, actively participate, and have a good balance of employees and experts with different backgrounds to find the risks. Daily activities referred, for example, to safety observations, daily discussions within the team, and using WhatsApp to communicate. To prevent unsafe activity, the interviewees mentioned that both management and employees can stop the work and ask for a new, safer work plan.

However, although the team's composition and activities was one aspect working well, individuals' attitudes and team activities emerged also when discussing what does not work well in hazard and risk assessment. Employees', risk assessment leaders', and management's attitudes received comments about them not being sufficiently invested or interested in the risk assessment. Furthermore, not all the interviewees were satisfied with participation in the risk assessment or with the understanding about the risks and rating the risk levels. Sometimes, risk assessment is done in a hurry to fulfill the company's bureaucratic demands before starting the work. Regarding communication, the interviewees mentioned that they do not receive feedback from the risk assessment and hence may feel like nobody cares how the assessments are done. Information about the results of the risk assessment does not reach all employees, nor does it move between different teams and departments. Even though the companies had plans and models for risk assessment, the answers revealed faults in the guidance because conducting the assessment is somewhat dependent on the person leading it. Because of the differences in knowledge levels and how the risk assessment is done, the customs and quality of the assessments vary between departments. The same factors are also reflected in the documentation and reporting, as the reports may not be understandable afterwards. Furthermore, the risk assessment software may feel too complicated to use, or it may not be possible to print short summaries from it. Finally, the interviewees felt that they have not received the resources to perform risk assessment even though the company demands it.

In developing a concerted way to act, the interviewees hoped, for example, for a shared and systematic way to perform risk assessment regardless of the department or person doing it and some way to confirm that the risks have been discussed with employees. Risk assessment software, forms, and checklists were mentioned as needing development, as well as orientation, education, and guidance. Communication, receiving overall feedback and positive feedback about successes, ensuring that employees are aware of the risks, and the need to hear about concrete actions to reduce risks arose from the answers. The interviewees suggest that it could be beneficial to discuss findings with other teams and departments and compare their own risk assessment with others' assessments. Because risk assessment is compulsory, the interviewees hoped that there would be clearly allocated time to prepare for the assessment and perform it with the thoroughness it deserves. The risk assessment team should include, among others, personnel familiar with the assessed work and

the necessary experts outside the specific work site. The interviewees also hoped to see that risk assessments would resolve issues that had not been solved before and that the results from the risk assessments would be more integrated into daily work and summarized into top risk lists.

When asked about the next step in risk assessment development, the interviewees chose developing and improving competence and knowledge, resources, and communication as the first targets. They mentioned benchmarking other's risk assessments, having enough time to perform the risk assessment, focusing on the most important development needs before moving forward to the next target, and clearly defined responsibilities. Developing both employees' and management's motivation and commitment, increasing orientation, education, and systematic communication, and focusing on the skills of the risk assessment leader came out of the answers.

DISCUSSION AND CONCLUSION

This research provides insights into factors affecting OHS risk assessment and development needs in the Finnish case companies. The results indicate that certain themes, such as the risk assessment team, individuals' attitudes, experience and knowledge, resources, and communication, emerged as themes affecting the risk assessment and needed development, regardless of the topic discussed. Further research is needed to focus specifically on these themes, to study their relations with risk assessment in more depth, and to develop effective intervention programs.

The results of this study are in agreement with those of previous studies. Aven and Krohn (2014) suggest that risk assessments could be carried out by professional analysts detached from decision makers or other stakeholders. Such analyses would still not be completely objective, as the assessment will always reflect the assessor's viewpoints, but are still less biased (Ball and Watt, 2013; Aven and Krohn, 2014). In this study, the interviewees commented on the composition and activities of the risk assessment team but did not say that the participants should be complete outsiders. They did, however, hope that they could collaborate more with other risk assessors and learn from each other's risk assessments.

In this study, individuals' experience and knowledge received attention. Likewise, it has been recognized in the literature that the ability to identify hazards and strategies to control them varies (Bahn, 2013; Pandit et al., 2019). Because of this variance, Bahn (2013) identifies the need to provide further training to both managers and employees. Albert et al. (2017) suggest that hazard recognition interventions could be targeted to commonly missed hazard sources. Furthermore, high-engagement training is associated with higher levels of hazard recognition compared to low-engagement training (Namian et al., 2016). Peace (2017) indicates that risk assessors also need training in the use of risk matrices. In this study, the interviewees recognized a lack of understanding of risk ratings. Like the criticisms presented in articles by Anthony Cox (2008) and Ball and Watt (2013), the interviewees felt that the results are somewhat dependent on the person leading the assessment. Finally, the participants hoped for more training, guidance, and feedback,

which is supported by, for example, Duijm (2015), who commented the use of risk matrices and recommended guidance, training, and feedback for risk matrices users. However, for example Ball and Watt (2013) discuss whether it is even possible to increase risk assessors' precision in using two-dimensional risk matrices with training. This indicates that training should not be organized just for the sake of training, but rather that the objectives and goals of the training should be carefully considered.

The limitations of this study include a fairly homogeneous research sample and a limited number of respondents. However, the backgrounds, education, and work experience of the interviewees varied, and the responses began to present similar issues, indicating that saturation was achieved. Interaction between the researcher and the interviewee may have affected the conduct of the interviews and the results. Semi-structured interviews ensured that all topics were discussed, giving the opportunity to discuss more freely and deeply when necessary (Gideon, 2012). Supporting the quality of the results, the coding was done by two researchers who discussed the meaning of the citations and codes and carried out the coding iteratively (Cascio et al., 2019).

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