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Limitations and improvements to the risk assessment process in Olive Oil Mills: the views of OSH practitioners

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ABSTRACT

Although most of the accidents occurred in Olive Oil Mill (OOM) resulted from “basic” risks, there is a need to apply adequate tools to support risk decisions that can meet the specificities of this sector. This study aims to analyse the views of Occupational, Safety & Health (OSH) practitioners about the risk assessment process in OOM, identifying the key difficulties inherent to the risk assessment process in these sector, as well as identifying some improvements to the current practice. This analysis was based on a questionnaire that was developed and applied to 13 OSH practitioners working at OOM. The results showed that the time available to perform the risk assessment is the more frequent limitation. They believe that the methodologies available are not an important limitation to this process. However, a specific risk assessment methodology, that includes acceptance criteria adjusted to the OOM reality, using risk metrics supported on the frequency of accidents and workdays lost, were indicated as being also an important contributions improve the process. A semi-quantitative approach, complemented with the use of the sector accident statistics, can be a good solution for this sector. However, further strategies should also be adopted, mainly those that can lead to an easy application of the risk assessment process.

Keywords: Occupational Safety; Olive Oil Mills; OSH Practitioners; Risk Assessment; Risk Decisions

1. INTRODUCTION

Olive Oil Mill (OOM) industry is one of the most important activity sectors in Spain, particularly in the region of Andalusia that holds 74% of the overall national production (Agencia de información Y Control Alimentar, 2014). In fact, Spain remains as the world leader producer of olive oil. Close to 23% of olive groves are located in Spain, which is responsible for about 47% of the olive oil in the world (Consejería de Agricultura, Pesca Y Medio Ambiente, 2013).

The risk management process at the OOM is not a straightforward process. These industries presented particularities that make this process more difficult to carry out. Most of the companies are small sized and the number of workers is irregular throughout the year (Parejo-Moscoso *et al.*, 2013). In addition, in most of the companies, the health and safety management system is undertaken by an external prevention service, which do not cover in some cases all the critical areas, such as the case of ergonomics (Parejo-Moscoso *et al.*, 2013). This can be a critical issue in a sector where most of the occupational accidents are related with excessive physical effort (Parejo-Moscoso *et al.*, 2012).

Despite most of the accidents occurred in this sector are considered as “basic” risks, such as excessive physical effort and fall-related injuries (Parejo-Moscoso *et al.*, 2012), a correct risk assessment need to be developed in order to provide supportive information to the companies managers, with a definition about the measures that are needed and adjusted to this type of companies’ reality. Therefore, there is a need to apply adequate tools to support risk decisions in this specific sector.

Accordingly, this study aims to analyse the views of Occupational, Safety & Health (OSH) practitioners about the risk assessment process in OOM, identifying the key difficulties inherent to the risk assessment process in these companies, as well as identifying some improvements to the current practices.

2. MATERIALS AND METHOD

An analysis of the views of OSH practitioners that deal with OOM about the actual limitations to the risk assessment process, as well as the identification of improvements to this process was performed. To this end, a questionnaire was developed and applied to 13 OSH practitioners.

The questionnaire was divided in two parts. The first part referred to the professional characterization, by asking the OSH practitioners about their qualification, academic background, years of experience and the number of years working with OOM. The second part comprised three questions. In the first question the inquired OSH practitioners were instructed to classify the level of limitation of four different factors to the risk assessment process in the OOM: (1) Accidents data available by the companies; (2) Risk acceptance criteria included in the risk assessment methodologies; (3) Risk assessment methods available; (4) Time spent with risk assessment process. At the end, they were asked to comment their options. The factors included in this question have been frequently mentioned in previous studies as important limitations to the risk assessment of occupational accidents in SMEs (Jacinto & Silva, 2010; Khanzode *et al.*, 2012). Despite the fact that the identified limitations may be linked to the risk assessment process, the quality of the process must be guaranteed and for that purpose some factors need to be considered. Pinto *et al.* (2013), for example, have noted some important factors for the quality of risk assessment process in the construction sector. Some of the identified factors were included in this study, according to their applicability to the OOM risk assessment. Therefore, in the second question OSH practitioners were asked about the importance of some factors for the quality of the risk

assessment process: (1) Accident reports; (2) Risk assessment methods adjusted to the needs of the OOM; (3) Risk assessment tools based on a quantitative approach; (4) Structured process for hazards identification; (5) Identification of the relationship between causes-effect; (6) Identification of the safety barriers; and (7) The support of risk decisions on acceptance criteria defined specifically for OOM. In the last question it was analysed how OSH practitioners view the applicability of different ways to carry out the risk assessment process in OOM, in order to give important insights to a new methodology to be developed: (1) The use of the accident reports from the sector; (2) Severity assessed as number of days lost; (3) Severity assessed as a qualitative scale; (4) Probability derived from the accident frequency; (5) Probability assessed as a qualitative scale; (6) The use of diagrams to establish the relationship between hazard, event, and consequence.

3. RESULTS AND DISCUSSION

The OSH practitioners had in average 12.4 years ($SD=5.3$) of experience with OSH duties and work with OOM in average for 9.9 years ($SD=5.5$).

The results showed that the main limitation identified by OSH practitioners to the risk assessment process in OOM is the time available to perform it (92.3%), followed by the criteria included in the risk assessment methodologies (30.8%) and the data of the companies available to support an objective risk assessment (30.8%). The risk assessment methods available were not seen as a problematic issue to the risk assessment process in OOM sector, because only 15.4% of the respondents had identified it as a limitation. In fact, considering that the inquired OSH practitioners are external consultants in the OOM sector, they do not have much time to spend with risk assessment process as an in-house practitioner, making difficult to develop a more objective analysis of the risk. Moreover, in Spain, the National Institute for Safety and Health at Work (INSHT) (www.insht.es) recommend a qualitative method to be used in small-sized and medium-sized enterprises (SMEs), which can be apply by the OSH practitioners (Carrillo-Castrillo *et al.*, 2014). This method is based on a risk matrix, where the likelihood of accidents and their expected severity are presented as categorical variables. Therefore, most of the OSH practitioners will perform the assessment of the occupational risks in a qualitative way, i.e., decisions about risk will be more based on the knowledge, perception and experience of the decision-makers (Hughes & Ferret, 2007) and the companies' accident reports will not be seen as a critical issue to the risk assessment process. However, it is important to note that some respondents considered the absence of accidents data by the companies as a limitation to the risk assessment process. In fact, with the use of this information, the subjectivity inherent to this process can be reduced and further important information can be provided. Furthermore, the criteria included in the risk assessment methodologies were also seen as a limitation by some respondents. Despite most of them consider the methodologies used adequate to the OOM sector, the criteria included on it may not be the most appropriate to their reality. Rodrigues *et al.*, 2014 discussed this issue, emphasizing the need to adjust the acceptance criteria included in the risk assessment methodologies to the companies' reality. Also Rodrigues *et al.* 2012, in a case study with Portuguese OSH practitioners found that a significant number of them adjust the acceptance criteria included in the methodologies, particularly when risk matrices are used.

The importance of some specific factors to the quality of the risk assessment process was also analysed and the results are presented in Figure 1. This information will be relevant to better understand the key issues to keep in consideration when designing a new risk assessment methodology for this specific sector.

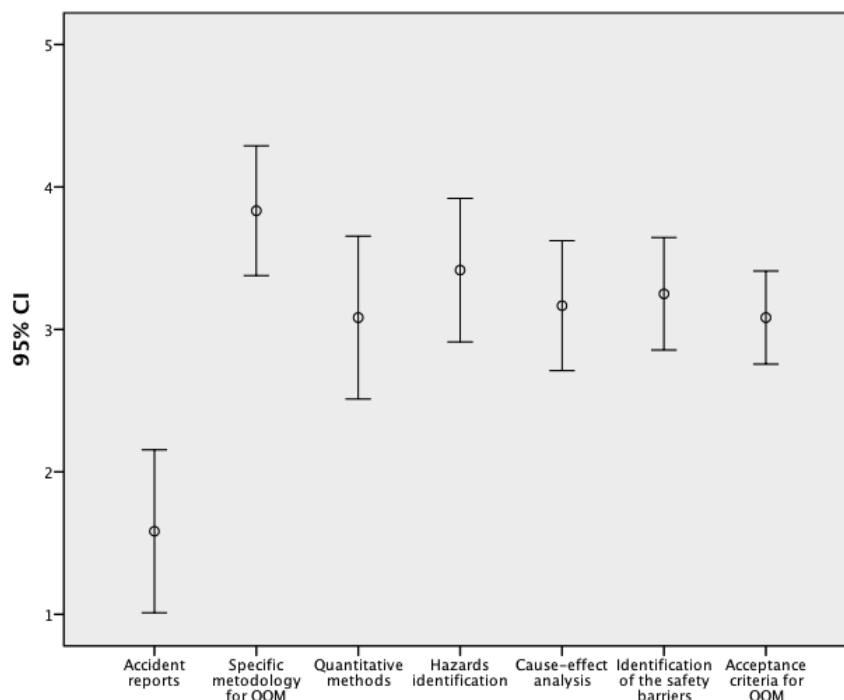


Figure 1 – 95% confidence interval for the importance of some factors to the quality of the risk assessment process.

According to the obtained results, most of the OSH practitioners consider that the use of accidents statistical reports to support a more objective risk assessment process is not an important issue. These results can be related with the current practices of OSH practitioners in Spain. Several Spanish practitioners may use the methodology proposed by the INSHT. Furthermore, the time available to spend with the risk assessment process is short, therefore it is possible that they believe that a more objective approach is difficult to apply to OOM sector. However, when they were asked about the use of quantitative measures for probability, as accidents frequency, and consequences, as the number of workdays lost, most of the respondents considered these measures a good alternative to improve the risk assessment process in the OOM sector (Frequency of accidents: 30.8% "applicable" and 69.2% "very applicable"; Days lost: 30.8% "applicable" and 61.5% "very applicable"). They also referred that the data of the sector could be a good solution to support risk decisions (30.8% applicable and 69.2% very applicable).

The results of the Figure 1 also show a high importance attributed by the respondents to a specific risk assessment methodology for the OOM sector, with specific acceptance criteria. These results were also found in a previous study by Rodrigues *et al.*, 2014. Furthermore, they believe that it is important to perform hazard identification in a systematic way, as well as the analysis of the cause-effect, analysing of the relationship between hazard, event, and consequence, and the analysis of the safety barriers to prevent or protect from the risks. These results indicate that there is a need of a methodology that ensure that all the important factors will be considered in the risk assessment process, particularly the probability and the severity of registered accidents. This kind of methodology is not a new approach in Spain, since Carrillo-Castrillo *et al.* (2014) had already proposed a method based on the concepts of task and accident mechanisms for an initial risk assessment by taking into consideration the prevalence and severity of the maintenance accidents reported.

4. CONCLUSIONS

Despite the low importance assigned to the companies' accidents reports to improve the risk assessment process, the results of this study support the need to develop a specific tool for risk assessment at the OOM sector. That tool need to include acceptance criteria adjusted to the OOM reality and to use risk metrics supported on the frequency of accidents and workdays lost as the measures to assess accidents' probability and severity respectively. Since time is an important limitation, a semi-quantitative approach could be a good solution to consider in this sector. This type of methodology, complemented with the use of the sector accident statistics, can turn the process more objective and easy to apply. However, further strategies are also need , mainly for ease this process and make it more quick.

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