A proposed web-based model for teaching risk assessment methods

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1. Introduction

During the last decades much research has focused on the association between work-related exposures and musculoskeletal disorders, and a number of risk assessment methods for physical ergonomics have been developed (Neumann 2007, Takala, Pehkonen et al. 2010).

However, recent studies have shown that the knowledge about these methods is very limited among ergonomists in the occupational health services (OHS). The ergonomists often assess risks in the work environment by sole observation, based on his/her own knowledge and experience, without the use of any specific method (K. Eliasson et al., manuscript). Further, a survey investigating the use of evidence based practice within the OHS concluded that there is a need for education and training in reliable and valid methods (Alipour, Nyman et al. 2012).

Although there already exist both shorter courses and master programs in ergonomics at university level, there is a lack of more informal, easy-to-access educational material on risk assessment methods.

Web-based education and training often allows self-directed, self-paced instruction and can be considered a good alternative to traditional learning methods for ergonomists wanting to increase their professional competence. However, there is a lack of studies investigating the pros and cons of using e-learning within this field.

The present study is part of the OBS-project, an on-going project with the overall purpose to evaluate six observational methods for assessment of biomechanical exposures. The six methods are: Assessment of Repetitive Tasks (ART) (Ferreira, Gray et al. 2009), Hand Arm Risk Assessment Method (HARM) (Douwes and de Kraker 2012), Model for assessment of repetitive work by the Swedish Work Environment Authority (SWEA) (The Swedish Work Environment Authority 2011), Occupational Repetitive Actions (OCRA) checklist (Occhipinti and Colombini 2006), Quick Exposure Check (QEC) (David, Woods et al. 2008), and Strain Index (SI) (Moore and Garg 1995).

The specific objective of this sub-study was to evaluate a web-based pedagogical model targeting OHS professionals aimed at facilitating the teaching and the dissemination of observational risk assessment methods.

2. Method

Twelve female OHS ergonomists with more than five years of experience of performing general ergonomic risk assessments took part in the web-based education. The model used a web-based platform originally developed for student-teacher communication in a university setting.

The web-based model consisted of: (1) a pre-recorded general lecture on risk assessment, (2) pre-recorded instruction videos which included “walk-through” examples where the methods were applied on different work tasks, and (3) self-supported training using a video library with film clips (two to six minutes long) of different work tasks. Each of these films were accompanied by written information on the work task; e.g. length of exposure, pause- and rests, weights of handled goods, ratings of force exertion, discomfort, and work demands.

Some of the work task films were filmed using one camera; however several of the films used three synchronized camera angles including close-up on hand and wrist movements. The manuals and the protocols for all methods were available for download on the website.

The ergonomists individually learned and trained on the methods during a three-week period. After completion, they were given evaluation questionnaires concerning general aspects of risk assessment and specific questions for each method. The questionnaires were used for designing group interviews concerning
both the usability of the methods and the web-based pedagogical model. Three group interviews (approximately 1-1.5 hours long) were conducted. After transcription of the interviews, summarization and interpretation was made using thematic content analysis.

3. Results

Four different themes were identified: (1) Lectures and instruction videos, (2) Interaction with teachers and other participants, (3) Content and technical aspects of the work task films, (4) Feasibility of implementing web based learning of risk assessment methods in the OHS.

The ergonomists were mainly positive towards the present web-based pedagogical model. Concerning the instruction videos, the participants appreciated the “walk-through” examples, and the possibility to follow "the expert" performing the risk assessment. However, the lack of interaction possibilities (synchronized as well as unsynchronized) with the teacher and the other participants was seen as a major drawback.

Regarding the film clips with the different work tasks, the interviewees preferred the films with three synchronized camera angles, which they thought gave a more comprehensive impression of the work tasks. The ergonomists all agreed that using e-learning as a pedagogical tool for continuous professional development within the OHS is highly feasible. However, the value of discussions with colleagues and experts within the field was highlighted throughout the interviews.

4. Discussion

E-learning as a pedagogical model is accessible, affordable for professionals (minimizing time away from work), and relatively easy to administer. However, in the design of such web-based training models, large emphasis needs to be put on increasing the interaction between participants (peer-learning), and feedback from teachers.

The present study did not investigate to what extent the education and training de facto increased the knowledge on risk assessment in general or the methods in particular. Neither did it compare the web-based model to traditional education. This is something which needs to be further explored in the future.

References


