

ABSTRACT

Purpose: The main objective of this study was to explore the management of occupational noise induced hearing loss (ONIHL) in the South African large-scale mines, from policy formulation to implementation and monitoring. Specific objectives included firstly reviewing current regulations, Acts, and policies regarding occupational noise-induced hearing loss in the South African mines. Secondly, establishing the extent to which these regulations, Acts and policies are observed, and/or implemented in hearing conservation programmes (HCPs) in South African mines. Thirdly, exploring factors influencing implementation of HCPs within the South African context. Lastly, exploring the role of audiologists in HCPs within the South African context.

Participants: Data were obtained from three sources. The first set of data were derived from six members of the Mine Health and Safety Council (MHSC) representing the State, Labour and the Employer; seven audiologists, two ventilation and occupational health engineers and one occupational hygienist. These participants were chosen from the websites of companies affiliated with the mining industry. Participants were contacted telephonically and via email to request their participation in the study.

The second source of data were obtained through document analysis of Acts, policies, regulations, and guidelines concerning occupational health and safety in the mining industry, particularly on ONIHL in the mining sector since 1994. These documents were selected through purposive sampling as it allowed the researcher to use data previously collected and readily available online. Websites of the companies affiliated with the mining industry were searched for the above-mentioned documents. This search yielded eight documents focusing on ONIHL and HCPs in the mining sector in South Africa.

Finally, data were collected from a systematic review of published studies on the management of ONIHL in the mining industry in Africa. This study utilised original pieces of scientific work and reports published in peer-reviewed scientific journals, conducted in the African mining sector between January 1994 and December 2016 and were published in English. These focused on the management of ONIHL in the mining sector in Africa. Various electronic bibliographic databases searched included Science Direct, PubMed, Scopus Medline, ProQuest and Google Scholar. The literature search yielded nine articles meeting inclusion criteria.

Design: The design used was a qualitative, cross sectional, non-experimental study, incorporating document analysis of policies, regulations, published articles, systematic review of literature and in-depth interviews with various stakeholders within the mining sector as well as a systematic review.

Data Analysis: A qualitative deductive content analysis approach was adopted for the current study. This allowed for a systematic and objective means to make valid inferences from verbal in-depth interviews with the stakeholders. It also allowed the use of written data from the analysis of Acts, policies, regulations, published studies and reports to describe the management of ONIHL within the South African mining sector.

Results: Findings of the current study revealed an overall lack of progress in minimising and/or eliminating ONIHL in South African mines. Based on the systematic review of literature on the management of ONIHL in the South African mining sector, current findings revealed that no single study has attempted to comprehensively or holistically address all the pillars of HCPs in the mining sector in South Africa. This was evidenced by the piecemeal fashion in which published studies post 1994 have been conducted; where individual pillars instead of comprehensive holistic HCP

have been targeted. Additionally, findings from these studies revealed only four pillars have been investigated in the last two decades.

Current findings also confirmed ONIHL remains a serious occupational health condition in South Africa. Such impairment interferes with quality of life and bears significant financial implications. This was revealed in stakeholders' views on the management of ONIHL in the South African mining sector. Factors such as lack of clearly defined action plans, as well as minimal collaboration among stakeholders were found to contribute to the failure of achieving desired outcomes in the elimination of ONIHL in the mining industry. Education and awareness training, as well as leading practice were highlighted factors contributing to progress in reducing ONIHL in the mining sector.

Findings from the analysis of policies, regulations and Acts revealed a flaw in the crafting, structuring and implementation of HCPs, particularly the 2003 and 2014 MHSC milestones on the elimination of ONIHL in the mining sector. These flaws speak to the fact that firstly, these targets focus upon only two aspects of noise conservation: hearing deterioration and noise source. Secondly, the sequencing of the milestones appears incongruent to the goal. Lastly, the time frame stipulated for reducing noise at the noise source increased from 5 years in 2003 to 8 years in 2014. Without a doubt, these flaws have an impact on achieving the desired outcomes.

Furthermore, in the South African mining sector, current findings have highlighted serious gaps in the role of occupational audiologists in the management of ONIHL and implementation of HCPs. Currently, occupational audiologists, whose scope of practice encompasses ONIHL, are minimally and peripherally involved in the development and execution of HCPs. Therefore, if this situation is not properly addressed, may result in the continuing lack of progress towards the elimination of ONIHL.

Lastly, the current study also revealed that access into the mining industry for research purposes is highly restricted. This has significant implications for objective and evidence-based HCPs in the South African mining industry.

Conclusions: Current findings attest to the complex nature of HCPs currently implemented in the South African mining industry. This author suggests HCPs should be viewed as complex interventions. Such a stance will assist in improving occupational health and safety at the individual, organisational, policy, and population levels of the mining industry. Therefore, as a way forward, the current study has successfully argued for HCPs to be viewed as complex interventions. Thereby, paving a way for mines to conduct realist reviews to better understand and contextual factors contributing to the successes and failures in implementing HCPs in the mining sector.

Furthermore, drawing from MHSC milestones on the elimination of ONIHL and the conceptual framework adopted in this study, an introduction of a feedback-based noise-monitoring model has been proposed as part of the current findings. Practically, this model can be used to estimate, monitor and provide quantitative information which can assist policy makers and mining administrators when making decisions regarding occupational health and safety in the mining industry. Thus, the impact of ONIHL in the mine could be reduced. Additionally, the model forms part of early intervention in the management of ONIHL in the workplace. This would result in significant savings in ONIHL compensation claims. As well, it would contribute to the quality of life of the people exposed to excessive noise in the workplace.

Key words: Access, Complex Interventions, Hearing Conservation Programmes, Mine Health and Safety, Mining Industry, Noise-monitoring tool, Occupational Audiology, Occupational Health and Safety, Occupational Noise Induced Hearing Loss, Policies, Realist Reviews, Stakeholders