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RESEARCH ARTICLE

A Global Bibliometric Analysis of Hearing Loss in Ship's Crew (2015-2024): Trends and Challenges

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ARTICLE INFO	ABSTRACT
	Workplace noise is an important risk factor for hearing loss in workers. About 82% of deafness cases are caused by occupational noise among workers in the manufacturing industry sector. One of the workers who have the risk of deafness or hearing loss is the ship crew. This study uses bibliometric analysis to determine how noise becomes a risk factor for hearing loss. Data on crew noise was obtained using the Dimensions database. This dataset includes many scientific papers, publication trends, lead authors, and key topics covered in the bibliometric analysis. Data was explored using the keywords "ship crew noise levels on hearing loss." This bibliometric analysis found that noise, health, safety, sea, and ship were the most discussed topics. This study also revealed that 4 out of 5 authors with the most documents came from South Korea, making South Korea the largest country in contributing documents related to "ship crew noise levels on hearing loss".
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INTRODUCTION

Noise is one of the problems that cannot be avoided due to technological advances. Based on data from the World Health Organization (2018), noise in the workplace is an important risk factor for hearing loss in workers, with 7% - 21% of hearing loss worldwide. According to The Centres for Disease Control and Prevention (CDC), in 2015, about 82% of deafness cases were caused by occupational noise that occurred among workers in the manufacturing industry sector. The data shows that noise is a risk factor for hearing loss.

Noise can be defined as a sound that can disturb comfort and health and cause deafness. Noise that occurs continuously with high intensity can unconsciously affect the health of the crew on duty on the ship. Noise exposure is more significant than 85 dB, and exposure for more than 8 hours will cause the risk of hearing loss (Wa'addulloh, M. et al., 2024).

The hearing loss experienced by crew members in the engine room of passenger ships is a significant occupational health issue. Engine rooms are identified as one of the noisiest environments on board, contributing to noise-induced hearing loss (NIHL). Noise-induced hearing loss is sensorineural deafness, which goes unnoticed at first, as it does not yet interfere with daily conversation. Risk factors for deafness include noise intensity, length of service, length of noise exposure in a day, and compliance with the use of Ear Protection Equipment (EPE) (Lumonang et al., 2015).

Hearing loss in ship crew members requires a bibliometric analysis to evaluate the existing literature. Through this method, researchers can identify publication trends, lead authors, and key topics covered in this study. Bibliometric analysis not only provides an overview of how much research has been done but also helps in finding gaps that need to be further explored (Sweileh, 2020).

METHOD

Data source

Data on ship crew members' noise-induced hearing loss was obtained through the Dimensions database. Dimensions is a platform that provides access to a rich database of information about publications, citations, and collaborations between researchers. The platform makes it easy to track the number of citations received by specific works, identify publication trends, and see how certain topics evolve. Dimensions also allow users to analyse networks between publications and authors, providing a clear picture of collaboration among scientists and institutions.

The data search was conducted on January 15, 2025, using the keywords "Ship's Crew Noise Levels on Hearing Loss." These keywords are used in the title, abstract, or keywords of scientific articles. Several criteria are required for the search: depth database literature, original research articles, articles published in 2015-2024, English language, and relevant topics.

Analysis data

The data obtained through Dimension is then saved in CSV format and visualized using the VOSviewer application. This application can be downloaded for free on the web at https://www.vosviewer.com/. The VOSViewer application can find the relationship between topics, with the main topic being the Ship's Crew Noise Levels and Hearing Loss.

RESULT AND DISCUSSION

Data searches through the Dimensions database obtained 38,249 documents on the ship's crew noise levels on hearing loss, with the following details (Figure 1).
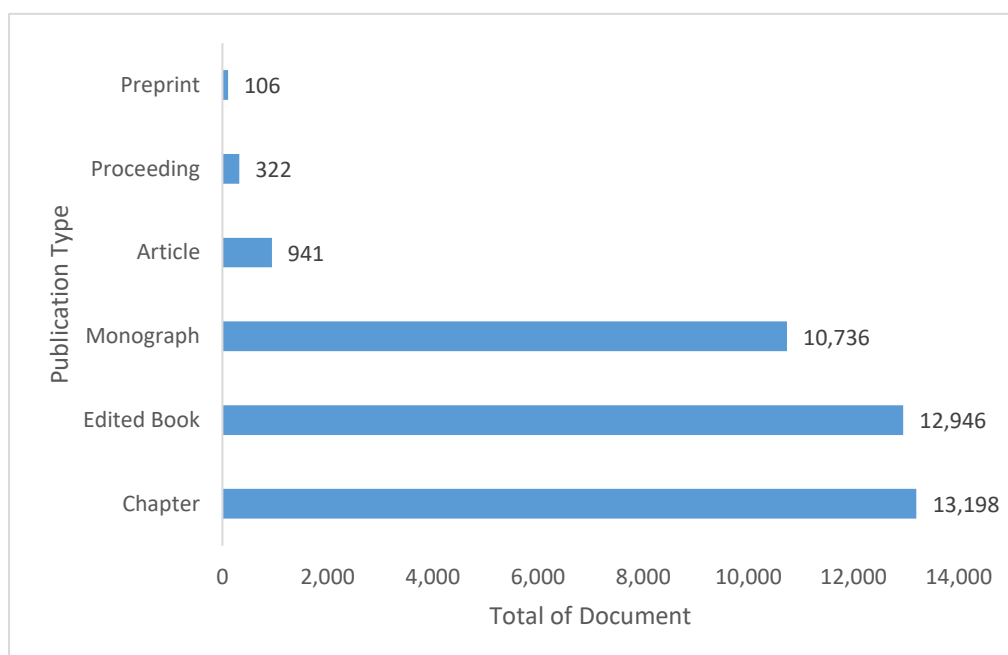

Figure 1: Total number of documents over 10 years (2015-2024)

Based on one of the criteria, namely research articles, 941 article documents were obtained that fit the criteria. Browsing research results shows that this topic is still an interesting topic to study (Figure 2).
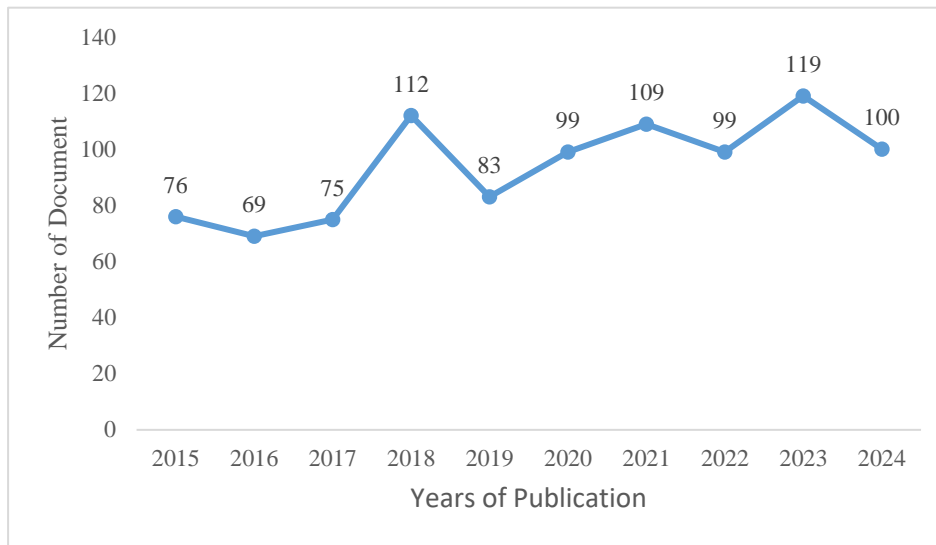

Figure 2: Number of documents per year

Figure 2 shows that the number of documents significantly decreased in 2019-2022, the year of the COVID-19 pandemic, which caused trade or transportation activities using ships to be stopped. In the following year, research on ship crew noise levels and hearing loss increased again as the COVID-19 pandemic subsided.

Figure 3: Countries with the most number of documents

In Figure 3, two countries contribute the most documents: the United States of America with 75 documents and South Korea with 70 documents. This is in line with Table 1, which shows that four out of five researchers with the most documents come from South Korea.

Table 1: Ship's crew noise levels on hearing loss researchers with the most documents

Author	Institution	Document	Citation
Yun-Chul Hong	Seoul National University, South Korea	36	11
Mi Na Ha	Dankook University, South Korea	24	18
Seung-Do Yu	National Institute of Environmental Research, South Korea	16	11
Ho-Jang Kwon	Dankook University, South Korea	15	5
Jinliang Zhang	Chinese Research Academy of Environmental Sciences, China	15	10

Some authors partner with other authors when making publications. In Figure 4, it can be seen that there is an extensive network between one author and another. The more often an author appears in publications on the same topic, the more the author concerned understands the topic they write about. Furthermore, the more understanding an author has, the more worthy the author is to be used as a reference for further research on related topics. (Nuraeni et al, 2022; Masniah et al, 2024).
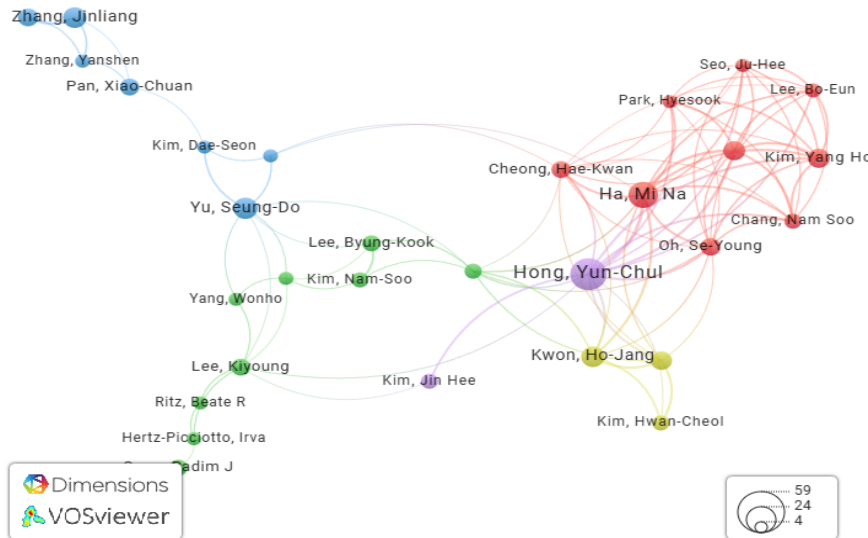

Figure 4: Author network with publications related to ship's crew noise research topic

In searching data with the Dimension database, several keywords and additional topics were found in research related to ship crew noise levels and hearing loss. Some supporting topics can be seen in Figure 5, including noise, health, safety, sea, and ship. This is in line with the topic of ship crew noise levels and hearing loss, which discusses the dangers of noise on the crew. Crew members exposed to noise for a long time can cause damage to the inner ear, so the ability to hear high-frequency sounds is lost. High-intensity noise that lasts for a long time, at least 5 years, will cause metabolic and vascular changes. Complaints can include hearing loss and ear ringing, which are slowly progressive (Marliyawati, 2020).
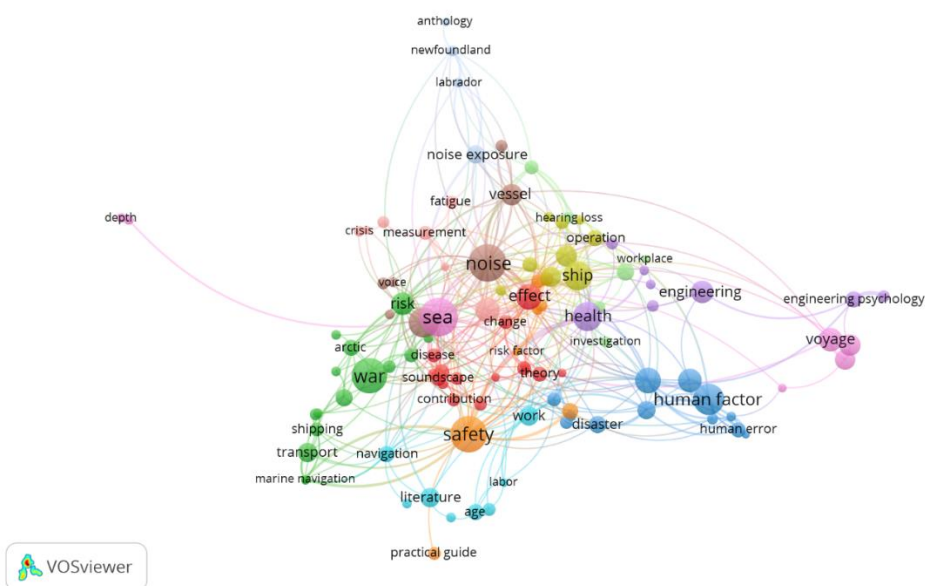

Figure 5: Research network related to ship's crew noise

In Figure 6, it can also be seen those keywords such as noise, health, safety, sea, and ship are much researched because they are topics that have a considerable depth of research and are widely carried out. Thus, these keywords can be a reference in further research when it comes to the topic of ship crew noise levels and hearing loss.
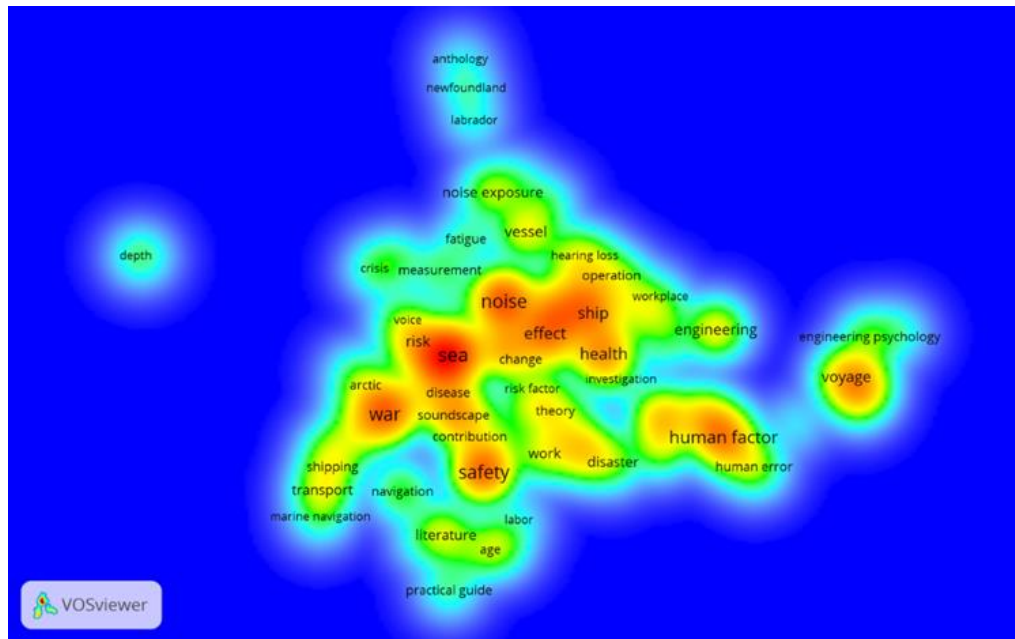

Figure 6: Visualization of research density trend

Keywords such as noise, health, safety, sea, and ship are appropriate because the crew's health is highly impacted in the future. Therefore, it is essential to understand occupational health and safety on board, given the working environment of crew members who work in the engine section with high noise levels (Österman, C et al., 2020).

Crew members can feel impacts from noise, including impaired concentration, irritability, sleeplessness, fatigue, decreased productivity, poor job morale, and high levels of sickness and absenteeism (Abidin, 2020). Other impacts include nausea, malaise, weakness, headache, and hypertension (high blood pressure).

CONCLUSION

The literature study related to ship crew noise levels on hearing loss using the bibliometric method found 38,249 documents, 941 of which fit the criteria. The theme of research on ship crew noise levels and hearing loss is a widely researched topic because, from 2015 to 2024, there has been an increase in the research trend. This bibliometric analysis found that noise can risk hearing loss. Based on data searches from the Dimension database, it is also known that the four authors with the most citations come from South Korea. This makes South Korea the country that contributes the most documents related to ship crew noise levels on hearing loss.

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