

BIBLIOMETRIC ANALYSIS: E-COUNSELING FOR FAMILIES OF ELDERLY INDIVIDUALS AT RISK OF FALLING

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ABSTRACT

This study employs a descriptive quantitative method with a bibliometric approach to analyze research trends related to fall prevention in the elderly. E-counseling, as an innovative approach to fall prevention, has not been widely explored in previous studies. Data indicate that approximately 30–40% of older adults experience falls each year, and 50% of them suffer recurrent falls, which may lead to serious injuries or even death. The bibliometric analysis was conducted to identify key keywords, research trends, and inter-topic relationships within the existing literature. The network visualization results show that topics such as “Prevention Program,” “Knowledge,” “Nurse,” and “Technology” are major focuses in this field of research. The role of technology and family support was also identified as a crucial factor in fall prevention strategies. The proximity of nodes in the network indicates that these keywords frequently co-occur in publications, reflecting strong interconnections among these topics in the context of fall prevention in the elderly. The importance of research on e-counseling for families of elderly individuals at risk of falling lies in its potential to provide emotional support and relevant information to help families manage fall risks. Through e-counseling, families can be better prepared to provide necessary care, enhance the safety of the home environment, and understand the specific risk factors faced by older adults. This study is expected to serve as a foundation for the development of more effective and targeted e-counseling programs, ultimately improving the quality of life and safety of the vulnerable elderly population.

Keywords: e-counseling, elderly family, fall risk, bibliometric analysis, fall prevention

INTRODUCTION

Data indicate that approximately 30–40% of older adults experience falls each year, and 50% of them experience recurrent falls, which can lead to serious injuries or even death. The decline in physical and health capacities with advancing age often increases the risk of falls among the elderly. Several factors have been identified as influencing fall risk in older adults, including socio-demographic attributes, home environment, level of physical activity, medication use, and health conditions (Kamel et al., 2013; Al-Ardhi & Atiyah, 2022). Understanding these factors is essential for developing effective prevention strategies tailored to the specific needs of elderly individuals.

The home environment plays a significant role in both the quality of life and fall risk among older adults. Factors such as home safety, accessibility, and environmental

hazards can contribute to an increased risk of falls (Hanapi et al., 2019). Moreover, an inadequate living environment may further heighten the incidence of falls in the elderly (Mahmoodabad et al., 2018). By assessing and modifying the home environment, fall risk can be minimized, thereby enhancing elderly safety.

Certain health conditions are also strongly associated with fall risk. For instance, lower urinary tract symptoms (LUTS) and dementia have been identified as significant risk factors for falls in older adults (Schimke & Schinike, 2014; Lim, 2017). Proper management of these health conditions is crucial in reducing the risk of falls and their potential negative consequences.

Community-based interventions, such as multicomponent primary care programs, have demonstrated effectiveness in preventing falls among community-

dwelling older adults (Marrocco, 2023). Additionally, innovative technologies like mobile robots powered by deep reinforcement learning have been proposed as tools to reduce fall risk in the elderly (Namba & Yamada, 2018). These approaches can complement traditional prevention strategies and enhance the overall effectiveness of interventions.

In this context, e-counseling offers great potential to provide appropriate support and preventive interventions for families of elderly individuals at risk of falling. Through a comprehensive understanding of various risk factors, e-counseling programs can be effectively developed to enhance the well-being and safety of vulnerable older adults.

Therefore, this study aims to analyze research trends in the field of e-counseling for families of elderly individuals at risk of falling, using a descriptive quantitative method with a bibliometric approach, to provide in-depth insights and strategic recommendations for fall prevention in older adults.

METHOD

This study employed a descriptive quantitative method with a bibliometric approach to analyze research trends concerning e-counseling for families of elderly individuals at risk of falling. Bibliometric analysis is a quantitative tool used to evaluate and understand the development of a research topic based on bibliographic data produced by academics through citations, collaborations, and publications (Zupic & Čater, 2015). In this study, bibliometric analysis was applied to evaluate the progress and trends of research related to elderly literacy, with a specific focus on e-counseling to reduce fall risk among older adults.

This research followed the four main steps of bibliometric analysis outlined by Donthu et al. (2021). The first step involved defining the objectives and scope of the study, aiming to describe research trends and distribution in the field of elderly literacy. The second step involved selecting

appropriate bibliometric techniques. This study applied the Co-Word technique from science mapping, which uses keywords in research titles and abstracts to identify and analyze topic trends.

The literature search was conducted in August 2024 using the PubMed, ScienceDirect, CINAHL, and ProQuest databases. The keywords used were aligned with Medical Subject Headings (MeSH) and combined using Boolean operators "OR/AND." The search terms included: "elderly" AND "family" AND "e-counseling" AND "fall risk" OR "fall prevention." The initial search yielded a number of relevant articles. To narrow the focus, a screening process was conducted by refining the keyword combinations, resulting in more relevant data.

The data collection continued with filtering articles based on specific criteria, namely: articles published in journals from 2019 to 2024, written in English, and focused on older adults as the study population. This process yielded a selection of articles suitable for further analysis.

Bibliometric analysis was conducted using VOSviewer software in the final stage, utilizing the co-occurrence feature to analyze and visualize the relationships between keywords in the selected articles. This method allowed for the identification of key trends and the structural landscape of research on the topic of e-counseling for families of elderly individuals at risk of falling.

RESULTS AND DISCUSSION

This bibliometric analysis aimed to explore the research trends related to e-counseling for families of elderly individuals at risk of falling. A total of 522 articles were identified from four databases: PubMed, ScienceDirect, CINAHL, and ProQuest. The analysis was conducted using VOSviewer software, focusing on keyword co-occurrence to identify dominant themes and research directions in the literature.

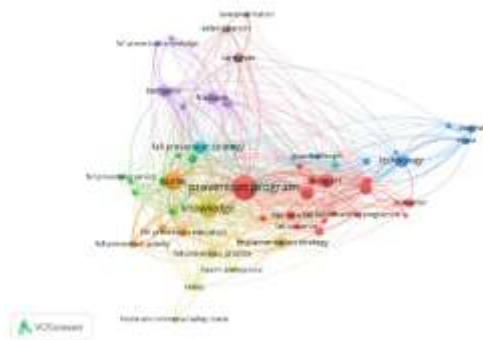


Figure 1. *Network Visualization*

Source: Processed Primary Data (2024)

Figure 1 presents a Network Visualization illustrating the number and interrelationships among keywords derived from 522 articles. Each coloured circle represents a keyword found in the dataset, with the size of the circle indicating the frequency of the keyword's appearance (Hamidah et al., 2020). Thus, the larger the circle, the more frequently the keyword appears in the collected data.

In Figure 3, two keywords “prevention program” and “knowledge” have the largest circles, indicating the highest frequency among all keywords. These two main topics are connected to various subtopics or sub-keywords, which can be observed through the connecting lines linking them to other terms. Keywords with different colours represent different clusters, reflecting thematic groupings within the dataset.

By setting a minimum occurrence threshold of 2, the analysis yielded 49 items, which are grouped into 8 clusters. Each cluster reflects a unique thematic focus and provides insights into how research in this area is distributed and interconnected.

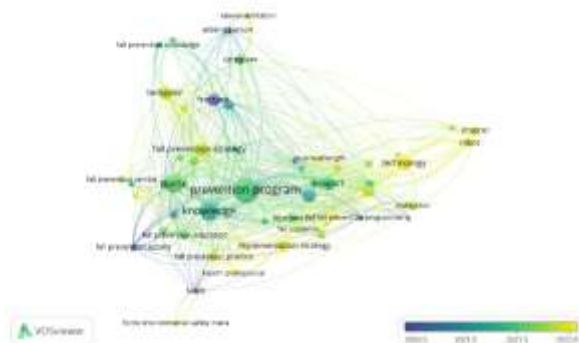


Figure 2. *Overlay visualizations*

Source: Processed Primary Data (2024)

The overlay visualization illustrates the temporal trajectory of publications within a particular research domain. Figure 2 shows that the topic “*prevention program*”, marked in blue, has been present since around 2020. On the other hand, research on *digital literacy in the elderly* has gained increasing popularity from 2020 to 2022. In this context, the topic of digital literacy among older adults is closely linked to other subtopics (showing connections with other items), such as the *digital gap*, the *ability to search for health information online*, *communication*, and various other related themes.

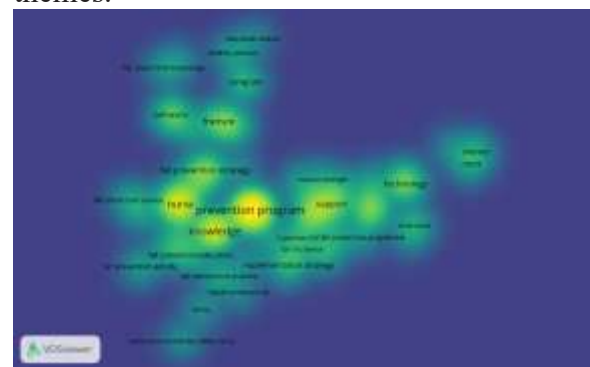


Figure 3. *Density Visualization*

Source: Processed Primary Data (2024)

In Figure 3, the brightest node represents the keyword “*Prevention Program*”. This reflects its high frequency and centrality in the network visualization, where numerous items are connected to the “*Prevention Program*” node. The figure depicts a network visualization of keywords related to research on fall prevention programs for the elderly, generated using VOSviewer, a software tool designed to create visual maps from bibliometric data. Each keyword is represented by a node in the figure, with the node's color indicating the density or frequency of that keyword's occurrence in the dataset. Yellow signifies high density, while green and blue indicate lower levels of frequency.

The main keywords in this figure include “*Prevention Program*,” which appears as one of the most prominent nodes, signifying that fall prevention programs are frequently discussed topics in elderly fall prevention research. Other keywords such as

“Knowledge” and “Nurse” are also relatively dominant, highlighting the importance of knowledge and the role of nurses in fall prevention efforts. Furthermore, the presence of the keyword “Technology” underscores the significance of technological aspects in fall prevention strategies, while “Family” and “Support” point to the critical role of family and social support in mitigating fall risks.

Nodes that are positioned closely in the visualization indicate that the corresponding keywords often co-occur in the literature. For example, “Prevention Program” and “Knowledge” are situated near each other, suggesting that these topics are commonly discussed together. Keywords such as “Technology” and “Robot” further indicate ongoing discourse on the use of advanced technology in fall prevention programs. The figure also reveals several clusters or groupings of closely related keywords, such as a cluster focused on “fall prevention strategy” and “implementation strategy,” as well as another cluster containing “internet” and “robot.”

This visualization map is valuable for identifying research trends, uncovering topic interrelationships, and determining areas that require further investigation or attention. Overall, the figure illustrates how various elements and factors such as technology, prevention programs, knowledge, and support from both families and healthcare professionals are interconnected in the body of research on fall prevention in the elderly.

CONCLUSION

The importance of research on e-counseling for families of elderly individuals at risk of falling lies in its potential to provide emotional support and relevant information to help families manage fall risks. Through e-counseling, families can be better prepared to deliver the necessary care, improve the safety of the home environment, and understand the specific risk factors affecting older adults. This study is expected to serve as a foundation

for the development of more effective and targeted e-counseling programs, which will ultimately enhance the quality of life and safety of the vulnerable elderly population.

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