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Improving Functional Status of Older Adults Through Health Literacy: A Literature Review

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Abstract: *Older age can be followed by an aging process that shows a decrease in physical function due to various degenerative problems that reduce immunity and therefore the older adults vulnerable to infectious diseases. Health literacy can improve the physical function of older adults to use self management agents, obtain social support, get access to health services, and to increase their quality of life. The paper aims to obtain evidence of the impact of health literacy on improving the health status and functional or physical well-being of older adults living in community and clinical settings. This paper used some databases Proquest databases: PubMed, Sage Journal, Scopus, Ebscohost, Science Direct, and Taylor & Francis. There are 11 articles published in 2014 and 2024 that were reviewed using the PRISMA method. This review found that there are different types of health literacy media (print and digital), and there are combinations of health literacy with physical activity interventions to deliver health information to older people. Standardized health literacy media in terms of readability and ease of use, such as video/web/electronic, game-based, digital, and mobile-based, and health literacy interventions combined with planned physical activities can increase knowledge, self-efficacy, cognitive function, quality of life, and reduce frailty scores, fall risk, and depression scores.*

Keywords: *Older adult, health literacy, health education, functional status*

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INTRODUCTION

The increasing age is followed by the aging process, which shows a decrease of physical function due to various non-communicable diseases or degenerative problems that reduce immunity; therefore, older adults become vulnerable to infectious diseases. The most popular diseases found in older people are hypertension, arthritis, stroke, Chronic Obstructive Pulmonary Disease (COPD) and Diabetes Mellitus (DM), and in 2021, 44.32% of older adults in Indonesia had complaints of physical and psychological pain (Kementerian Kesehatan Republik Indonesia, 2016; Badan Pusat Statistik, 2021).

The older people are facing social problems in the form of poverty, disability, neglect, or isolation because they have no relatives or family, or because of the inability of relatives to care for the older adults properly due to economic, social, or other problems. These problems are making older adults require residential services at social rehabilitation centers (Kementerian Sosial Republik Indonesia, 2021).

A cross-sectional study assessed the relationship between health literacy, physical function, mental health, and restricted activity, which allied to health among new Medicare enrollees. It suggests that low health literacy is directly associated with poor health. The people might not lack access to health services, yet the quality of their experiences is hampered due to ineffective communication in medical meetings, making worse by a lack of access to health information.

A study evaluated the relation between health status, social support, self-care agents, and health knowledge among older people in long-term care in Xinjiang, China. It mentioned that enhancing health literacy enables older people to use self-care services and social support appropriately in promoting their health status; therefore, health literacy assessment is important for older adults to be applied in nursing practice (Liu et al., 2018).

It was also mentioned in another study that, due to aging and loss of functional status, older adults are eager to gain knowledge relevant to health conditions (Sun, et al., 2020). Similarly, a systematic review looking at the impact of interventions based on technology on declining substance abuse among older adults found that participants in personalized education programs expressed great satisfaction with health education interventions using images, messages, and videos and voiced their determination to change their self-medicating behaviors (Kazemi et al., 2021).

Research conducted in the UK found that poor health literacy in older people in long-term units of care is an indicator of bad quality of life for older people (Panagioti et. al., 2018). Additionally, other research mentioned that older people with inadequate health literacy in Hong Kong have a higher risk of hospitalization, so health improvement programs for older people are required (Leung et al., 2016).

A randomized clinical trial research of the effects of an educational program based on the Health Literacy Index (HLI) on older adults self-management, which conducted an educational program in four sessions, 45–60 minutes in each session, for four weeks in groups of 8–10 older adults, demonstrated an increase in self-management skills and health promotion behavior (Ghalenow et al., 2022). Various health literacy programs for older adults were mentioned in a review in North America, where these health literacy programs were tailored to the necessities of the older adults, such as stroke information education programs, diabetes intervention information, increased knowledge of Alzheimer's disease, health information from websites, the ability to search for basic health data, and various program methods that support the advancement of health knowledge implemented by professionals and librarians (Manafo & Wong, 2012).

METHODS

Article searches were on an open access database, after we established the theme using the PICO model. The search engines used were Proquest, PubMed, Sage Journal, Scopus, Ebscohost, Science Direct, and Taylor & Francis. With keywords in the term MeSH, we search free text, medical subject, nursing subject, and public health subject to search the paper ("health literacy" OR "health education"), (AND Functional status AND older adult**)** and key words ("health literacy" OR "health education") AND ("functional status" OR "Health status") AND older adult, ("leaflet-based) AND (electronic-based) AND (web-based) AND (health literacy) AND (older adult")**.** The inclusion criteria for the literature search were: 1) full-text articles; 2) articles that were published from 2014 to 2024; 3) English articles; 4) older adult populations; 5) aging topics; and 6) research articles with a quasi-experiment design and a randomized control trial.

The exclusion criteria of 362 research papers are: 1) more than 10 years of published articles; 2) meta-analysis, systematic review, and literature review; 4) not full text articles; 5) wrong population, wrong outcomes, and wrong intervention. The literature search in this study was carried out in several steps. It started with searching using keywords in the seven databases, then selecting according to the inclusion and exclusion criteria that had been set, until articles that fit to the research objectives were obtained. Article selection was done using the flowgram of PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses), which has some stages such as identification, screening, eligibility, and inclusion.

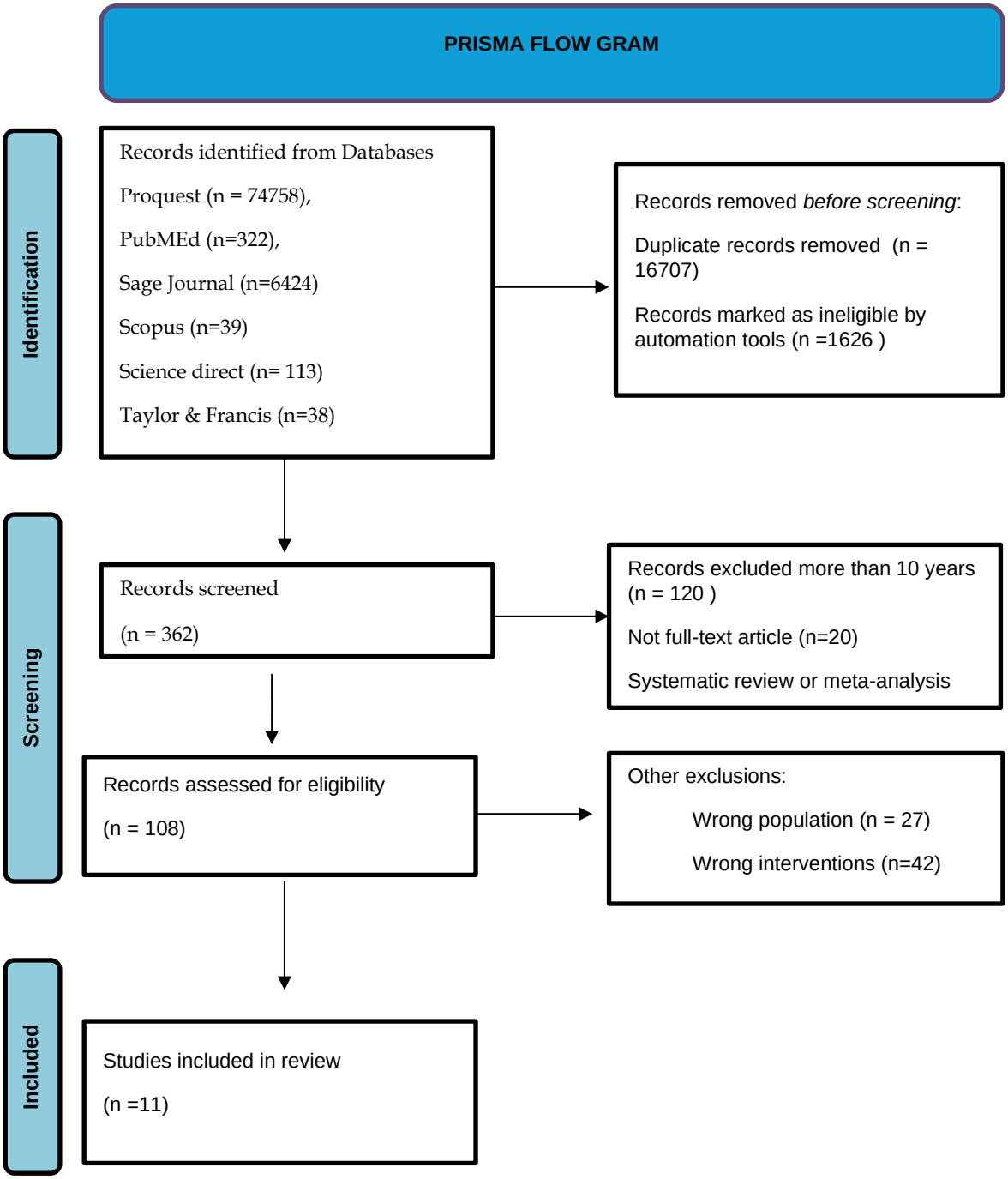

Figure 1. Prisma Flowgram

RESULTS

The results of the 11 articles that were systematically reviewed can be seen in the Table 1 and 2 as the following:

Table 1: Article Reviewed

Article Number	Title	Author (Year)
1	Easy to Read Health Education Material Improves Oral Health Literacy of Older Adults in Rural Community-Based Care Centers: A Quasi-Experimental Study	Sun, et al (2021)
2	The effects of a leaflet-based health guide on health literacy, self-efficacy, and satisfaction among older Japanese-Brazilian adults living in Brazil: A quasi- experimental study	Kanno, et al (2021)
3	Effect of a Digital Literacy Program on Older Adults' Digital Social Behavior: A Quasi-Experimental Study	Lee et,al (2022)
4	Effect of Pictograph-Based Discharge Instructions on Older Adults' Comprehension and Recall A Pilot Study	Choi (2016)
5	An education intervention to improve decision making and health literacy among older Australians: a randomised controlled trial	Smith et,al (2019)
6	Feasibility of a Sensor-Controlled Digital Game for Heart Failure Self-management: Randomized Controlled Trial	Radhakrishnan et al., (2021)
7	Comparison of multimedia and printed patient education tools for patients with osteoporosis: a 6-month randomized controlled trial	Lopez-olivo et,al (2020)
8	Effectiveness of mobile augmented reality–integrated oral health education for community-dwelling older adults: A randomized controlled trial	Romalee et al., 2024
9	Effectiveness of educational nursing home visits on quality of life, functional status and care dependency in older adults with mobility impairments: a randomized controlled trial	Buss et al., 2016
10	Effects of a multifactorial intervention comprising resistance exercise, nutritional and psychosocial programs on frailty and functional health in community-dwelling older adults: A randomized, controlled, cross-over trial	Seino et al., 2017
11	Effect of Health Literacy Intervention on Glycemic Control and Renal Function Among Thai Older Adults at Risk of Type 2 Diabetes Mellitus	Seangpraw et al., 2023

Table 2. Articles Outcome

Number of Article	*Outcome*
1	*A quasi-eksperimental study of* 124 participants showed significant differences in the effect of health education materials. EZ-to-read materials improve health literacy scores in older people community more than general text materials. Additionally, implementing the EZ-to-read concept expanded the field of education for the elderly and reduced the health knowledge gap due to illiteracy.
2	Leaflet-based health guidance only has a short-time effect in a quasi-experimental study of 21 older adult participants.
3	Digital literacy education increased the usage of smartphones, happiness, and cognitive function (p value = 0.05).
4	Pictograph-based instruction proved its effectiveness in advancing comprehension and recall in 42 elderly people with low reading skills after hip replacement surgery compared to the text-only group. It illustrates the importance of this approach in rehabilitation care settings.
5	In a randomized controlled trial of 153 elderly participants aged 65 years and over, the results indicate the usefulness of complementary medicine resources on decision-making self-efficacy and health literacy had no differences based on how the resources were delivered via video player, website, or booklet. Participants found the resources useful and rated the content as good or excellent.
6	This randomized controlled research showed that participants with Heart Failure who used Sensor-Controlled Digital Game felt satisfied with its ease of use, and they showed improvements in functional status (physical activity step with p value <.001) and in monitoring their daily weight (p value .04) which improved their quality of life, knowledge, and self-efficacy.
7	In a randomized controlled trial of post-menopausal older women, it was shown that neither multimedia tools nor printed booklets are effective in developing knowledge and reducing decision-making conflict. None of them showed a clear advantage in the long-term population. However, those with limited health knowledge would prefer printed material. Therefore, using printed materials only for this population may be more appropriate. Patient preferences and individual patient learning styles may be integral factors in determining the presentation format when educating patients with osteoporosis.
8	The randomized controlled parallel trial conducted oral health education with traditional-based lectures and the Mobile Augmented Reality (MAR) educational method with 61 participants. The research found that oral health status in both groups improved, but the MAR method group showed a better score in knowledge (p value .002) and self-efficacy (p value .001).
9	A randomized controlled trial was given to 48 participants, allocated into two groups: the intervention group, which was given educational nursing interventions about mobility and quality of life through counseling, information, training, and an instructor, and the control group, which was given usual care. After the intervention had been given, the intervention group showed better scores in functional status, quality of life, care dependency, cognitive, self-efficacy, and depression dimensions (p value 0.05) than participants who dropped out.
10	A randomized controlled trial of 77 older people with pre-frail and frail conditions was allocated into an immediate intervention group that got resistance exercise, education about nutrition, and psychosocial programs twice per week for about 3 months, and another group was a delayed intervention group that had no interventions. The group with multifactorial interventions had a lower score in frailty prevalence, walking test, and depression score, which indicates reduced frailty and better functional health.
11	A randomized controlled trial of 128 older people was divided into an intervention group and a control group. The intervention group got a planned activity program based on diet, exercise, weight management, and diabetes guidelines for 12 weeks with 180–240 minutes every session (lectures, demonstrations, games, singing, training, and group work). The outcomes of the intervention showed a higher score in health literacy and health behavior (p value <0.05), which was followed by an effect of the intervention on the HbA1c of the intervention, which was 0.57 times lower than the control group.

DISCUSSION

This review was conducted based on 11 studies that identified various types of health education for older adults (print-based, digital, electronic, or multimedia) in community settings and in hospitals or clinics, along with the advantages of education for older adults.

Three studies identified the use of print media as an educational medium. The printed media include guidebooks, leaflet-based and pictographs, which were made using the Easy to Read method; leaflets for Japanese-Brazilian using the native language of older adults; and print-based educational media using simple line drawings (Sun et al., 2021;Doi-Kanno et al., 2021& Choi, 2016). The three studies mentioned above use standardized font sizes, fonts, and pictograph shapes that can be read by participants with various levels of reading ability and have illustrations to make it easier to understand. This is in accordance with the Joint Commission recommendations, which state that health literacy materials meet the needs of patients by using readability tests. Complex information is divided into bullet points, and modified document fonts, layout, and design improve readability. The result was also supported by research on people with sensory impairments or difficulties reading the leaflet content; a large print with at least 14 points of font is needed, or there should be an audio version available. Another finding showed that using a leaflet-based education medium for patients with terminal illnesses can lead to misunderstandings in explaining the cause of diseases, so it needs other support interventions, i.e., psychosocial support, controlling symptoms, respecting the patient's view, etc (Otani et al., 2014).

Our review found some studies that use sensor-controlled digital game to improve self-management (Radhakrishnan et al., 2021), mobile augmented reality as an educational method (Romalee et al., 2024) and using smartphones to deliver digital literacy programs (Lee et al., 2022). These papers showed that smartphone game-based, and mobile-based increased knowledge, self-efficacy (Radhakrishnan et al., 2021 & Romalee et al., 2024), physical activity adherence (Radhakrishnan et al., 2021) and the expanded use of smartphones promotes happiness and cognitive capability (Lee et al., 2022). Patients with varying levels of self-care dependency wanted to use a health application if its functionality and user interface were simple and easy to understand (Wali et al., 2020). Other research supports the following results: older adults who obtained nutritional lectures traditionally and touch-screen tablet computer lessons of nutrition application with internet access felt fresh, happy, and had great achievement feelings; they also improved knowledge (p value 0.001) and self-efficacy (p value <0.05). This result gives an opportunity for health and behavioral change in older adults with or without internet experience (Chiu et al., 2019).

This literature review also found studies of educational media with video/web/electronic-based, and web-based education or DVD in older adults (Lopez-Olivo et al., 2020; Smith et al., 2019). The outcome of these studies refers to the fact that multimedia/web-based learning increased knowledge and decreased conflict in decision-making, but there were no significant changes in participant self-efficacy in disease management between the intervention and control groups. Also, this study shows that there was no significant difference in any medium of information delivered by web/video player and booklet versus only booklet material, suggesting that no particular format was more effective than another. Research conducted by (Hall et al., 2015) support that whether an older adult uses resources or not, there is no significant difference in self-efficacy in making medical decisions. A qualitative study presented about older adults' perceptions of multimedia health tutorials shows that older people might need help using devices, but there will be opportunities and challenges in developing the devices. According to Chin et al., (2017), designing learning experiences for older people needs to be less demanding in terms of process capability, i.e., education material with clear concepts and less difficulties in search and reorganization processes are pivotal.

Finally, this review also found some studies that combine educational programs with physical activities or exercise to improve the functional status of older adults. The educational programs were transferred through lectures, demonstrations, counseling, instructors, and physical activities through exercise or training (Buss et al., 2016; Seino et al., 2017 & Seangpraw et al., 2023). All three studies

showed that older people who had an educational program and physical exercise had a higher score in health literacy, a reduced frail score, a better score in functional status, and quality of life, and a lower depression score. Research conducted by Wang et al., (2022) also supported these findings that high health literacy and regular physical training were protective factors of frailty. Limited health literacy has strong associations with morbidity, mortality, the use of healthcare services, and cost, but higher health literacy has a stronger association with the functional status of older people than medication use (Magnani et al., 2018).

The strength of this study is that the papers that we reviewed were articles about health literacy and health educational programs with a quasi-experimental and randomized controlled trial method. This review not only compared the types of educational material (printed and digital-based) but also the combination of educational programs for transferring health literacy. However, the papers we reviewed are heterogeneous and come from many different studies, making it difficult to compare the results. This meant the literature we reviewed could have biases. The authors believe that this limitation gives space for more studies with various interventions for low health literacy among older adults living in long-term care with or without caregiver availability. The reviewed process will be particularly critical for researchers to bring out more future research on health education programs for older adults, as it will improve the method with less bias.

It is noteworthy to highlight that even though studies have shown a significant association between physical health status and adequate health literacy, some studies only evaluate health literacy in older adults based on their reading skills and their ability to process information. Improving health literacy needs proper assessment, evidence-based intervention, and a multidisciplinary working team in healthcare to build health information literacy skills for older adults.

CONCLUSION

Our review of the effectiveness of health education media in improving the functional status and self-management of older adults gives a broad overview of providing health information to older adults living in hospital-based and community-based services. Health information and intervention should be delivered optimally through printed media with reading standards, digital/web/video devices, game-based, mobile-based, and through comprising the educational program with exercise or physical training. These results reduced frailty and care dependency, low fall risk, improved functional status, quality of life, self-efficacy or management, and cognitive function in older adults.

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