

Effectiveness of Video-Assisted Learning on Knowledge and Attitude Regarding Prevention and Management of Selected Health Problems Among Older Adults in a Rural Community, Coimbatore, Tamil Nadu, India.

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Abstract:

Background: A quasi-experimental study was conducted to evaluate the effectiveness of a structured video-assisted learning programme in improving knowledge and attitude regarding the prevention and management of selected health problems among older adults in rural communities. Older adults frequently experience chronic conditions such as hypertension, diabetes mellitus, arthritis, cataract, and fall-related complications, and limited access to structured health education contributes to inadequate knowledge and unfavourable attitudes toward preventive care.

Methods: A quantitative quasi-experimental pre-test–post-test control group design was adopted. Sixty participants from rural communities of Coimbatore district were selected using purposive sampling and allocated into experimental (n = 30) and control (n = 30) groups. Baseline assessment was conducted using a structured knowledge questionnaire and a 5-point Likert attitude scale. The experimental group received a 30-minute structured video-assisted educational intervention, while the control group received no intervention. Post-test assessment was conducted after the intervention. Data were analysed using paired t-test, unpaired t-test, and chi-square test.

Results: A statistically significant improvement was observed in the experimental group. The mean knowledge score increased from 8.5 ± 2.8 to 13.9 ± 4.8 ($t = 13.0$, $p < 0.05$), and the mean attitude score increased from 13.9 ± 6.0 to 43.9 ± 4.9 ($t = 16.0$, $p < 0.05$). The control group did not show a statistically significant change ($p > 0.05$). Post-test knowledge was significantly associated with occupation and follow-up medication practices ($p < 0.05$).

Conclusion: Structured video-assisted learning is an effective strategy for improving knowledge and fostering positive attitudes regarding the prevention and management of selected health problems among rural older adults.

Keywords: Video-assisted learning; Older adults; Rural health; Knowledge; Attitude; Preventive care

1. Introduction

Population ageing is increasing globally, and India is experiencing a steady rise in the elderly population. With increasing life expectancy, older adults frequently suffer from chronic non-communicable diseases such as hypertension, diabetes mellitus, arthritis, cataract, and fall-related complications. These conditions adversely affect independence, productivity, and quality of life, particularly in rural areas where healthcare access and health literacy remain limited.

In rural communities, inadequate awareness regarding preventive strategies, early warning signs, medication adherence, and lifestyle modifications contributes to late diagnosis and preventable complications. Conventional lecture-based health education methods may not be effective among older adults, especially those with limited literacy.

Video-assisted learning integrates visual and auditory components, making information easier to understand and retain. While multimedia approaches have shown effectiveness in urban and institutional settings, limited evidence exists regarding their impact among rural elderly populations. Therefore, the present study was undertaken to evaluate the effectiveness of video-assisted learning on knowledge and attitude regarding the prevention and management of selected health problems among older adults.

2. Need for The Study

Non-communicable diseases account for a substantial proportion of illness and disability among older adults. A large percentage of individuals aged 65 years and above live with one or more chronic conditions. In rural areas of India, conditions such as hypertension, metabolic disorders, visual problems, and musculoskeletal issues are often diagnosed at a later stage and remain inadequately controlled due to limited awareness and restricted access to professional guidance.

Insufficient knowledge about early warning signs, risk reduction strategies, medication adherence, and healthy lifestyle practices contributes to disease progression and preventable complications. Fall-related injuries and sensory impairments further increase dependency and add to the emotional and financial burden on families.

As the elderly population continues to grow, there is an urgent need for practical, cost-effective, and easily implementable community-based educational strategies. Video-assisted learning offers a structured and standardized method of delivering information in a format that is simple, engaging, and culturally adaptable. Strengthening health literacy among rural older adults may encourage self-care practices and promote healthier ageing.

3. Objectives

1. To assess the knowledge and attitude regarding the prevention and management of selected health problems among older adults in both experimental and control groups.
2. To evaluate the effectiveness of video-assisted learning on knowledge and attitude in the experimental group.
3. To compare post-test knowledge and attitude scores between the experimental and control groups.
4. To determine the association between post-test knowledge and attitude scores and selected demographic variables.

4. Hypotheses

H1: There will be a significant difference between pre-test and post-test knowledge scores in the experimental group.

H2: There will be a significant difference between pre-test and post-test attitude scores in the experimental group.

H3: There will be a significant difference in post-test knowledge and attitude scores between the experimental and control groups.

H4: There will be a significant association between post-test knowledge and attitude scores and selected demographic variables.

5. Conceptual Framework

The study was guided by **Ernestine Wiedenbach's Helping Art of Clinical Nursing Theory (1964)**, which describes nursing as a purposeful, goal-directed activity involving three key components: identifying the need for help, providing appropriate assistance, and evaluating the outcomes. This theory is relevant to the present study as it emphasizes systematic assessment, planned intervention, and evaluation—core elements of the research process. It is particularly applicable to educational interventions aimed at improving knowledge and attitudes toward health-promoting behaviours.

Identification of Need for Help:

The need for intervention was identified through a pre-test that assessed participants' knowledge and attitudes regarding common chronic conditions and their prevention. The results indicated inadequate knowledge and less favourable attitudes, highlighting the necessity for structured educational support.

Providing the Needed Help:

Based on the identified needs, a 30-minute video-assisted teaching programme was implemented for the experimental group. The content included disease prevention, early symptom recognition, lifestyle modifications, medication adherence, and fall prevention strategies. The session was facilitated by the researcher to ensure clarity and understanding.

Evaluation of the Help Provided:

The effectiveness of the intervention was evaluated through a post-test using the same assessment tools. The observed improvement in knowledge and attitude scores among participants demonstrated the effectiveness of the programme and supported the assumptions of Wiedenbach's theory.

6. Review of Literature

Several studies have explored the role of multimedia and video-based education in improving health outcomes among older adults. Research conducted in various settings has demonstrated that audiovisual teaching methods enhance comprehension, retention of information, and self-management behaviors among individuals with chronic conditions.

In the Indian context, community-based educational programmes have shown positive effects on increasing awareness of chronic disease prevention in rural populations. Studies conducted in rural South India have reported improved post-intervention knowledge scores among elderly participants following structured video-assisted teaching sessions. Some investigations have also highlighted improvements in fall-prevention awareness and adoption of safer practices.

However, many existing studies primarily focused on knowledge outcomes and provided limited evaluation of attitudinal changes. Moreover, there remains a scarcity of quasi-experimental research in rural areas of Tamil Nadu assessing both knowledge and attitude simultaneously. The present study was therefore designed to address this gap and generate context-specific evidence on the effectiveness of video-assisted learning among rural older adults.

7. Materials And Methods

Study Design

A quantitative approach with a quasi-experimental pre-test–post-test control group design was adopted to evaluate the effectiveness of the video-assisted learning programme.

Study Setting

The study was conducted in two selected rural communities of Coimbatore District, Tamil Nadu. Bodipalayam was assigned as the experimental group setting and Seerapalayam as the control group setting to avoid contamination of the intervention.

Study Duration

The study was conducted over a period of two months, from January 2025 to February 2025.

Study Population

The study population comprised older adults aged 60 years and above residing in the selected rural communities.

Sampling Technique and Sample Size

A non-probability purposive sampling technique was used to select the participants. A total of 60 older adults who met the inclusion criteria were selected and equally allocated into experimental ($n = 30$) and control ($n = 30$) groups.

Inclusion Criteria

- Older adults aged 60 years and above
- Diagnosed with at least one selected chronic condition (hypertension, diabetes mellitus, arthritis, cataract, or history of falls)

- Able to understand and communicate in Tamil
- Willing to participate and provide informed consent

Exclusion Criteria

- Older adults with severe cognitive impairment
- Critically ill individuals
- Those unwilling to participate

Intervention:

A structured 30-minute video-assisted educational programme was developed based on a literature review and expert guidance, covering the prevention and management of hypertension, diabetes mellitus, arthritis, cataract, and fall prevention. The video included simple explanations, visual demonstrations, lifestyle modifications, medication adherence, and warning signs. It was administered to the experimental group after the pre-test, while the control group received no intervention.

Data Collection Tools:

Section A: Demographic proforma including age, gender, education, occupation, income, religion, marital status, number of children, health services, medication practices, physical activity, assistive device use, and existing health problems.

Section B: Structured knowledge questionnaire with 30 multiple-choice questions (score range: 0–30).

Section C: A 5-point Likert attitude scale with 10 statements (score range: 10–50).

Content validity was established by seven experts, and necessary modifications were made.

Reliability:

The knowledge questionnaire (split-half, $r = 0.85$) and attitude scale (Cronbach’s alpha, $r = 0.82$) demonstrated good reliability.

Statistical Analysis:

Data were analysed using the Statistical Package for the Social Sciences (SPSS) version 25. Descriptive statistics such as frequency, percentage, mean, and standard deviation summarized demographic and study variables. Inferential statistics, including paired t-test, unpaired t-test, and chi-square test, assessed effectiveness and associations between variables. A p-value of < 0.05 was considered statistically significant.

8. Results

Table 1: Baseline Demographic Characteristics of Older Adults in Experimental and Control Groups (N = 60)

Variable	Category	Experimental (n=30) n (%)	Control (n=30) n (%)
	60–65	7 (23%)	5 (17%)

Age (years)	66–70	6 (20%)	11 (37%)
	71–75	10 (34%)	8 (26%)
	≥76	7 (23%)	6 (20%)
Gender	Male	18 (60%)	13 (43%)
	Female	12 (40%)	17 (57%)
Educational	No formal education	13 (43%)	9 (30%)
	Primary	10 (34%)	12 (40%)
	Secondary	4 (13%)	6 (20%)
	Graduate	3 (10%)	3 (10%)
Occupation	Unemployed	16 (53%)	20 (67%)
	Self-employed	8 (27%)	5 (17%)
	Private employed	4 (13%)	4 (13%)
	Government employed	2 (7%)	1 (3%)
Monthly Income	Below ₹5000	18 (60%)	19 (63%)
	₹5001–₹10000	6 (20%)	7 (23%)
	₹10001–₹20000	5 (17%)	2 (7%)
	≥₹20001	1 (3%)	2 (7%)
Religion	Hindu	13 (43%)	16 (53%)
	Muslim	8 (27%)	4 (13%)
	Christian	6 (20%)	8 (27%)
	Others	3 (10%)	2 (7%)

Table 1 shows that most participants in both groups were aged 66–75 years, with males predominant in the experimental group and females in the control group. The majority had low educational status, were unemployed, and had a monthly income below ₹5000, with Hindus forming the largest group. Overall, both groups were comparable at baseline.

Table 1a. Socio-Demographic and Health-Related Characteristics of Older Adults in Experimental and Control Groups (N = 60)

Variable	Category	Experimental (n=30) (%)	Control (n=30) (%)
Marital Status	Married	14 (46%)	16 (54%)
	Unmarried	5 (17%)	4 (13%)
	Separated/Divorced	6 (20%)	4 (13%)
	Widow/Widower	5 (17%)	6 (20%)
Number of Children	1	7 (23%)	5 (17%)
	2	13 (44%)	10 (33%)
	3	6 (20%)	9 (30%)
	>3	4 (13%)	6 (20%)
Available Health Services	Government	21 (70%)	19 (63%)
	Private	6 (20%)	9 (30%)
	Others	3 (10%)	2 (7%)
Follow-up Medication	Regular	20 (66%)	18 (60%)
	Irregular	8 (27%)	8 (27%)
	None	2 (7%)	4 (13%)
Regular Physical Activity	Walking	15 (50%)	13 (43%)
	Exercise	5 (17%)	4 (13%)
	Yoga	3 (10%)	5 (17%)
	None	7 (23%)	8 (27%)
Use of Assistive Devices	Spectacles	14 (47%)	16 (53%)
	Walking stick	8 (27%)	6 (20%)

	Hearing aid	4 (13%)	3 (10%)
	None	4 (13%)	5 (17%)
Health Problems Present	Hypertension	9 (30%)	10 (33%)
	Diabetes Mellitus	11 (37%)	10 (33%)
	Arthritis/ Joint pain	5 (16%)	6 (20%)
	Cataract	3 (10%)	3 (10%)
	Fall history	2 (7%)	1 (4%)
	Others	0 (0%)	0 (0%)

Table 1a presents the socio-demographic and health-related characteristics of participants in both groups. The majority were married, had two children, relied on government health facilities, and reported regular follow-up medication. Walking was the most common physical activity, and spectacles and walking sticks were commonly used assistive devices. Hypertension and diabetes mellitus were the most prevalent health problems. Overall, the similarities indicate that the experimental and control groups were comparable at baseline. This comparability suggests that any observed differences in outcomes can be attributed to the intervention rather than pre-existing differences. It also enhances the internal validity of the study findings.

Table 2: Distribution of Knowledge Levels Before and After Intervention (N = 60)

Knowledge Level	Experimental (n = 30)		Control (n = 30)	
	Pre (%)	Post (%)	Pre (%)	Post (%)
Inadequate	18 (60%)	0 (0%)	24 (80%)	20 (67%)
Moderate	12 (40%)	10 (33%)	6 (20%)	8 (27%)
Adequate	0 (0%)	20 (67%)	0 (0%)	2 (6%)

At baseline, most participants in both groups had inadequate knowledge. After the intervention, 67% of the experimental group achieved adequate knowledge with no participants remaining inadequate, indicating a marked improvement, while the control group showed minimal change. This demonstrates the effectiveness of the video-assisted learning programme in enhancing knowledge levels.

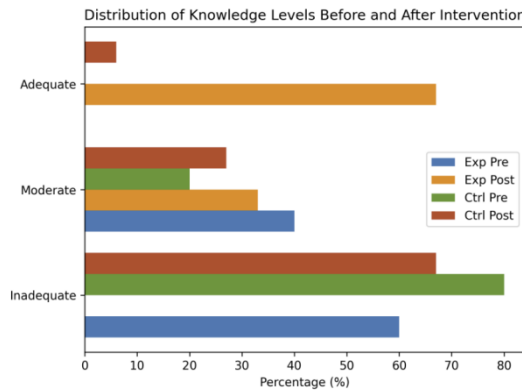


Figure 2: Distribution of Knowledge Levels Before and After Intervention (N = 60)

Table 3. Comparison of Mean Knowledge Scores (Pre- and Post-Test)

Group	Pre-test Mean \pm SD	Post-test Mean \pm SD	t-value	p-value
Experimental (n = 30)	8.5 \pm 2.8	13.9 \pm 4.8	13.0	P < 0.05*
Control (n = 30)	8.1 \pm 3.2	6.4 \pm 3.2	1.7	p > 0.05

*Significant at $p < 0.05$

A statistically significant increase in knowledge scores was observed in the experimental group following the intervention. No statistically significant difference was observed in the control group between pretest and post-test scores. This indicates that the improvement in knowledge can be attributed to the intervention. It further confirms the effectiveness of the video-assisted learning programme.

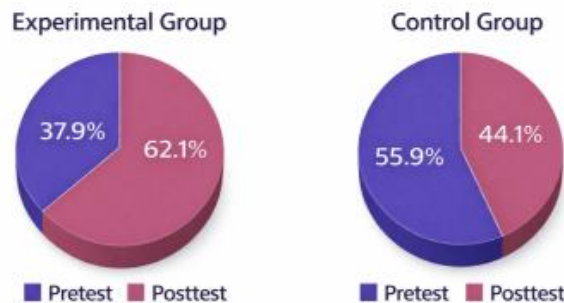


Figure 3: Comparison of Post-Test Mean Knowledge Scores Between Experimental and Control Groups

Table 4: Distribution of Attitude Levels Before and After Intervention (N = 60)

Attitude Level	Experimental (n=30)	Control (n=30)

	Pre n (%)	Post n (%)	Pre n (%)	Post n (%)
Unfavourable	16 (53.3%)	0 (0%)	19 (63.3%)	17 (56.7%)
Moderately Favourable	14 (46.7%)	2 (6.7%)	11 (36.7%)	13 (43.3%)
Favourable	0 (0%)	19 (63.3%)	0 (0%)	0 (0%)
Extremely Favourable	0 (0%)	9 (30.0%)	0 (0%)	0 (0%)

A marked shift toward favourable attitudes was observed in the experimental group after the intervention, while the control group showed minimal change. This indicates that the video-assisted learning programme was effective in improving attitudes and promoting positive health behaviours among older adults.

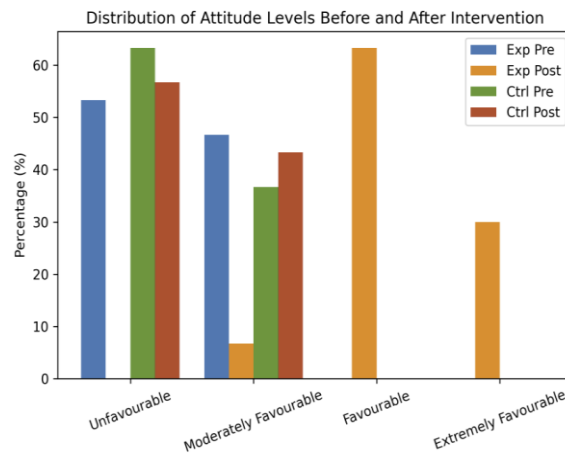


Figure 4: Distribution of Attitude Levels Before and After Intervention (N = 60)

Table 5: Comparison of Mean Attitude Scores (Pre-test and Post-test)

Group	Pre-test Mean ± SD	Post-test Mean ± SD	t-value	p-value
Experimental (n = 30)	13.9 ± 6.0	43.9 ± 4.9	16.0	P < 0.05*

Control (n = 30)	21.0 ± 3.2	22.5 ± 2.3	1.6	P > 0.05
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*Significant at $p < 0.05$

A statistically significant improvement in mean attitude scores was observed in the experimental group following the video-assisted learning intervention ($p < 0.05$), indicating a strong effect and substantial improvement in attitude levels. In contrast, the control group showed no statistically significant difference between pre-test and post-test attitude scores ($p > 0.05$). This indicates that the intervention was effective in enhancing positive attitudes toward the prevention and management of selected health problems among older adults. The improvement suggests increased awareness and a more favourable outlook toward preventive practices, highlighting the role of structured audiovisual education in influencing attitude and promoting health behaviours.

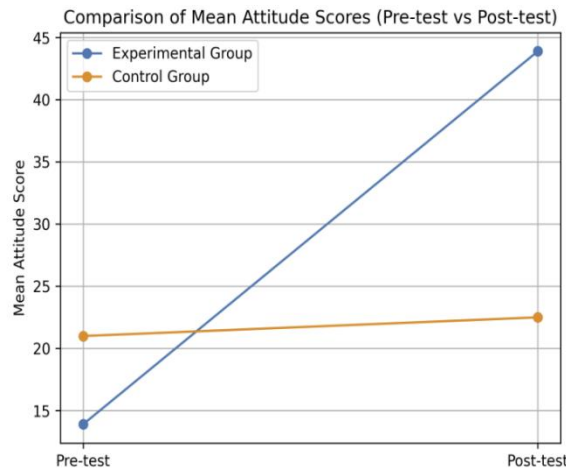


Figure 5: Comparison of Mean Attitude Scores Before and After Intervention (N = 60)

Table 6. Association Between Post-test Knowledge and Demographic Variables (Experimental Group, n = 30)

Variable	df	χ^2	Significance
Occupation	3	9.469	Significant*
Follow-up Medication	2	6.412	Significant*
Other Variables	—	—	Not Significant

*Significant at $p < 0.05$

Table 6 shows the association between post-test knowledge scores and selected demographic variables in the experimental group. Occupation and follow-up medication practices were associated with post-test knowledge scores in a statistically significant manner.

No other demographic variables showed a significant association. This indicates that occupation and medication follow-up may have influenced knowledge acquisition after the intervention.

Table 7. Association Between Post-test Attitude and Demographic Variables (Experimental Group, n = 30)

Variable	df	χ^2	Significance
All Variables	—	—	Not Significant

Interpretation

Table 7 presents the association between post-test attitude scores and selected demographic variables. No significant associations were found between post-test attitude scores and any of the demographic variables. This suggests that the improvement in attitude was observed across participants regardless of their background characteristics.

Discussion:

The present study showed that the structured video-assisted learning programme significantly improved knowledge and attitude among older adults in the experimental group, while no significant change was observed in the control group. These findings are consistent with Kim and Park (2019) and Zhang et al. (2021), who reported improved knowledge through multimedia and video-based education. The improvement may be attributed to simple visual explanations, which enhanced understanding, especially among participants with low educational levels, as supported by Chesser et al. (2022).

A positive shift in attitude from unfavourable to favourable levels indicates that structured interventions can promote preventive health behaviours, which aligns with findings by Alghamdi and Alqahtani (2023). In contrast, minimal change in the control group highlights that unstructured information is insufficient. The slight, non-significant decline in knowledge may be due to response variability or lack of reinforcement during the study period.

Conclusion

The present study concludes that video-assisted learning is an effective educational strategy for improving knowledge and developing positive attitudes regarding the prevention and management of selected health problems among rural older adults. Incorporating structured audiovisual education into community health programmes may enhance preventive practices and contribute to healthier ageing in rural settings. It also supports the integration of innovative teaching methods in geriatric health education.

Nursing Implications

Nursing Practice

Video-assisted teaching can be incorporated into community outreach programmes and geriatric health services. Nurses can use audiovisual tools during health education sessions to reinforce preventive practices.

Nursing Education

Community health nursing curricula should emphasize the use of multimedia teaching methods. Students should be trained to develop culturally appropriate educational materials.

Nursing Administration

Healthcare administrators may consider providing audiovisual resources in primary health centres. Structured video education programmes can be included in routine geriatric services.

Nursing Research

Future studies may examine long-term behavioural outcomes and clinical indicators. Comparative studies evaluating different digital education formats may also be undertaken.

Limitations

The study had certain limitations. The sample size was relatively small and selected using a non-probability purposive sampling technique, which limits the generalizability of the findings. The quasi-experimental design without randomization restricts the ability to establish a strong cause-and-effect relationship. Additionally, the study assessed outcomes over a short duration, and long-term retention of knowledge and sustained behavioural change were not evaluated.

Further studies with larger samples, randomization, and longer follow-up periods are recommended to strengthen the evidence.

Recommendations

Further research with larger samples and extended follow-up periods is recommended. Comparative studies between rural and urban populations may provide a broader understanding. Future investigations may also evaluate the long-term impact of digital health education strategies. Additionally, studies should assess the cost-effectiveness and scalability of these interventions across different healthcare settings. Including diverse age groups and cultural contexts will help determine generalizability and inform culturally sensitive program design.

Abbreviations

VAL -Video-Assisted Learning

NCDs- Non-Communicable Diseases

IEC - Institutional Ethics Committee

Conflict of Interest

The authors declare no conflict of interest.

Source of Support

The authors declare that no financial support or external funding was received for this study.

Ethical Approval

Ethical clearance for the study was obtained from the Institutional Ethics Committee before data collection. Written informed consent was obtained from all participants before enrollment in the study.

Acknowledgement

The authors express their sincere gratitude to the study participants for their cooperation. The authors also thank the community leaders and health workers of the selected rural areas for their valuable support during data collection.

References

1. Kim H, Park SY. Effects of multimedia health education on disease self-management among older adults. **J Clin Nurs.** 2019;28(21–22):4056–4064.
<https://doi.org/10.1111/jocn.14959>
2. Mohamed A, Nguyen HV. Technology-assisted health education in elderly populations. **BMC Geriatr.** 2020;20:315.
<https://doi.org/10.1186/s12877-020-01702-4>
3. Zhang Y, Wu X, Luo S. Video-based educational interventions for improving medication adherence. **Patient Educ Couns.** 2021;104(9):2238–2245.
<https://doi.org/10.1016/j.pec.2021.03.021>
4. Chesser AK, Burke A, Reyes J, Rohrberg T. Navigating the digital divide: eHealth interventions in older adults. **J Med Internet Res.** 2022;24(4):e32166.
<https://www.jmir.org/2022/4/e32166>
5. Silva AR, Santos M, Cortez-Dias N. Multimedia education to enhance healthy ageing. **Int J Environ Res Public Health.** 2023;20(6):4892.
<https://doi.org/10.3390/ijerph20064892>
6. World Health Organization. **Global status report on noncommunicable diseases 2023.** Geneva: WHO; 2023.
<https://www.who.int/publications/i/item/9789240060788>
7. United Nations. **World Population Ageing 2023 Highlights.** New York: United Nations; 2023.
<https://www.un.org/development/desa/pd/content/world-population-ageing-2023>
8. Li J, Theng YL, Foo S. ICT-based health education interventions among older adults. **Int J Med Inform.** 2022;159:104655.
<https://doi.org/10.1016/j.ijmedinf.2021.104655>
9. Park JY, Lee Y. Digital health literacy interventions in elderly populations. **BMC Public Health.** 2022;22:1894.
<https://doi.org/10.1186/s12889-022-14275-3>
10. Chen Y, Wang Q, Li X. Multimedia education and fall prevention awareness. **Geriatr Nurs.** 2021;42(5):1152–1158.
<https://doi.org/10.1016/j.gerinurse.2021.06.007>
11. Alghamdi SM, Alqahtani JS. Video-based health education and medication adherence. **Healthcare (Basel).** 2023;11(3):402.
<https://doi.org/10.3390/healthcare11030402>
12. Kumar S, Preetha GS. Health promotion among rural elderly populations. **J Family Med Prim Care.** 2021;10(8):3021–3027.
<https://journals.lww.com/jfmpc/fulltext/2021/10080>
13. Smith ML, Bergeron CD, Hochhalter AK. Community-based health education programs for older adults. **Gerontologist.** 2020;60(5):e278–e288.
<https://doi.org/10.1093/geront/gnz120>
14. Allender JA, Rector C, Warner KD. **Community and Public Health Nursing.** 9th ed. Philadelphia: Lippincott Williams & Wilkins; 2014.
<https://shop.lww.com/Community-and-Public-Health-Nursing/p/9781975111698>

15. Black JM, Hawks JH. **Medical-Surgical Nursing: Clinical Management for Positive Outcomes.** 10th ed. St. Louis: Elsevier; 2019.
<https://www.elsevier.com/books/medical-surgical-nursing/black/978-0-323-64099-6>
16. Kozier B, Erb G, Berman A, Snyder S. **Fundamentals of Nursing: Concepts, Process, and Practice.** 11th ed. Boston: Pearson; 2018.
<https://www.pearson.com/en-us/subject-catalog/p/kozier-and-erbs-fundamentals-of-nursing/P200000003482>
17. Polit DF, Beck CT. **Nursing Research: Generating and Assessing Evidence for Nursing Practice.** 11th ed. Philadelphia: Lippincott Williams & Wilkins; 2021.
<https://shop.lww.com/Nursing-Research/p/9781975110646>
18. Burns N, Grove SK. **Understanding Nursing Research: Building an Evidence-Based Practice.** 7th ed. St. Louis: Elsevier; 2017.
<https://www.elsevier.com/books/understanding-nursing-research/burns/978-0-323-67498-4>
19. Kothari CR, Garg G. **Research Methodology: Methods and Techniques.** 4th ed. New Delhi: New Age International; 2019.
<https://www.newagepublishers.com/servlet/nagetbiblio?bno=001334>
20. Gupta SP. **Statistical Methods.** 46th ed. New Delhi: Sultan Chand & Sons; 2019.