

EFFECTIVENESS OF A FAMILY-CENTERED AUDIOVISUAL EDUCATION INTERVENTION ON DELIRIUM KNOWLEDGE AND PREVENTION IN INTENSIVE CARE UNITS: A QUASI-EXPERIMENTAL STUDY

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ABSTRACT

Background: While family involvement is essential for mitigating ICU complications like delirium, limited caregiver knowledge often hinders effective participation. Audiovisual-based health education has emerged as a promising strategy to enhance understanding through engaging and accessible learning modalities.

Purpose: This study aimed to examine the effectiveness of audiovisual-based health education in improving knowledge among family caregivers of intensive care unit (ICU) patients.

Methods: A quasi-experimental study with a pre-test–post-test control group design was conducted involving 72 participants. Respondents were assigned to either an intervention group receiving audiovisual-based education or a control group receiving standard care. Knowledge levels were measured using a structured questionnaire before and after the intervention. Data were analyzed using the Wilcoxon signed-rank test for within-group comparisons and the Mann–Whitney U test for between-group differences.

Results: The intervention group demonstrated a significant increase in knowledge scores from 7.86 ± 2.55 to 16.19 ± 3.46 ($Z = 4.949$, $p < 0.001$), indicating a large effect size ($r = 0.70$). In contrast, the control group showed a non-significant improvement from 4.56 ± 1.78 to 6.28 ± 2.19 ($Z = 1.732$, $p > 0.05$). Between-group analysis revealed a significantly greater improvement in the intervention group ($\Delta = 8.33$) compared to the control group ($\Delta = 1.72$) ($Z = 7.062$, $p < 0.001$; $r = 0.99$).

Conclusion: Audiovisual-based health education is highly effective in improving caregiver knowledge and represents a practical, scalable strategy for enhancing family engagement in ICU care.

Keywords: Audiovisual Education; Delirium; Family Caregivers; ICU; Knowledge

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BACKGROUND

Delirium is a common and serious neuropsychiatric complication among critically ill patients, particularly in intensive care units (ICUs), and remains a significant global healthcare concern. It is characterized by acute disturbances in attention, awareness, and cognition that develop rapidly and fluctuate over time. The prevalence of delirium in ICU settings is reported to exceed 50% of critically ill patients, and it is strongly associated with adverse clinical outcomes, including prolonged hospitalization, increased mortality, and long-term cognitive impairment (Callahan et al., 2024). Beyond patient-related consequences, delirium also affects family members, contributing to psychological distress and increasing the risk of post-intensive care syndrome–family (PICS-F), thereby emphasizing the importance of a family-centered care approach in critical care settings (Krewulak et al., 2020).

Recent advances in critical care emphasize the integration of family engagement as part of evidence-based delirium management strategies. Current guidelines recommend non-pharmacological interventions, such as reorientation, sleep optimization, and early mobilization, which can be supported by family involvement (Vater et al., 2025). In this context, educational interventions targeting family caregivers have emerged as a promising approach to enhance their participation in delirium prevention and management. Studies over the past five years highlight that structured education particularly using multimedia or audiovisual methods can improve comprehension, retention, and consistency of information delivery, aligning with modern adult learning theories and digital health innovations (Krewulak et al., 2020).

Despite these advancements, empirical evidence indicates that family caregivers often have insufficient knowledge about delirium, limiting their ability to effectively contribute to patient care. Research shows that many caregivers are unable to recognize delirium symptoms or understand appropriate preventive strategies, which reduces their potential role as partners in care (Jung et al., 2021). At the same time, family members are uniquely positioned to detect subtle behavioral and cognitive changes due to their familiarity with the patient. Furthermore, recent studies demonstrate that involving family caregivers in delirium management can improve patient outcomes and reduce caregiver anxiety, reinforcing the clinical significance of enhancing caregiver knowledge (Lange et al., 2022).

However, existing research reveals several gaps. Most studies on delirium education have primarily focused on healthcare professionals, particularly nurses, rather than family caregivers as the main target population. Additionally, while some studies have explored caregiver education, there remains limited use of standardized, validated tools and controlled study designs to rigorously evaluate intervention effectiveness. Moreover, although audiovisual-based education has shown feasibility and potential benefits, evidence regarding its effectiveness in improving family knowledge in ICU settings especially in developing healthcare contexts remains insufficient and underexplored (Wheeler et al., 2023).

Therefore, this study introduces a novel approach by implementing a structured audiovisual health education intervention specifically designed for family caregivers of critically ill patients. Using a quasi-experimental design with a control group and a validated instrument, the Caregiver ICU Delirium Knowledge Questionnaire (CIDKQ). The findings are expected to contribute to the development of evidence-based, family-centered educational strategies in critical care nursing practice and to support the optimization of delirium prevention and management outcomes.

OBJECTIVE

to evaluate the effectiveness of audiovisual education in improving family knowledge of delirium.

METHODS

Study Design

This study employed a quantitative research approach using a quasi-experimental design with a non-equivalent control group. The design involved two groups: an intervention group receiving audiovisual health education and a control group receiving standard care without the intervention. Both groups were assessed using a pre-test and post-test design to evaluate changes in knowledge before and after the intervention. This design is appropriate for evaluating the effectiveness of educational interventions in real clinical settings where randomization is not feasible.

Setting and Participants

The study was conducted in the Intensive Care Unit (ICU) of RSD K.R.M.T Wongsonegoro, Indonesia, in May 2025. The target population consisted of family members of critically ill patients admitted to the ICU. Participants were eligible if they were aged ≥ 18 years, able to read and write, had been present in the ICU for at least one day, and had a significant relationship with the patient (e.g., spouse, child, parent, or relative). Exclusion criteria included family members with sensory impairments (hearing or vision problems) or those unwilling to participate

Sample Size and Sampling Technique

Sample size was determined *a priori* using G*Power (version 3.1.9.7), based on an independent samples *t*-test (two-tailed). Assuming a medium effect size ($d = 0.5$) in accordance with Cohen's (1988) conventions, a significance level of $\alpha = .05$, and a desired statistical power of 80% ($1 - \beta = 0.80$), the minimum required sample was calculated at 64 participants (32 per group). To account for potential attrition and non-response, the sample size was inflated by approximately 25%, yielding a final total of 80 participants, equally allocated to the intervention group ($n = 40$) and the control group ($n = 40$).

Participants were recruited using purposive sampling, whereby individuals who met the predetermined eligibility criteria were selected during the designated data collection period. This approach ensured that the sample was theoretically relevant and capable of providing meaningful data pertinent to the study objectives.

Intervention

Intervention Procedure

This study employed a quasi-experimental design with a non-equivalent control group pre-test/post-test approach. The intervention procedure was carried out in three sequential phases: preparation, implementation, and evaluation.

Phase 1: Preparation

Prior to data collection, ethical approval was secured from the Research Ethics Committee of RSD K.R.M.T. Wongsonegoro Hospital (Ref. No. 069/Kom.EtikRSWN/III/2025), and institutional research permission was obtained (Ref. No. KH.03.03/F.XXII.10.a/101/2025). Participant eligibility was determined through systematic screening based on predefined inclusion and exclusion criteria. All eligible participants were approached individually, provided with a verbal and written explanation of the study's purpose, procedures, and their rights as participants, including the right to withdraw at any time without consequence. Written informed consent was obtained from each participant prior to enrollment.

Phase 2: Implementation

Following informed consent, participants were assigned to either the intervention group ($n = 36$) or the control group ($n = 36$). Baseline knowledge was assessed in both groups using the validated Caregiver ICU Delirium Knowledge Questionnaire (CIDKQ), administered digitally via a QR-linked Google Form, prior to any intervention (pre-test).

The intervention group received a structured audiovisual health education program on ICU delirium, lasting approximately 20 minutes, delivered via a purpose-developed video media.

The educational content was developed and validated by ICU clinical experts and nursing faculty, and systematically covered: (1) the operational definition and pathophysiology of delirium, (2) predisposing and precipitating risk factors in critically ill patients, (3) clinical manifestations and subtypes of delirium, (4) evidence-based non-pharmacological prevention strategies, and (5) the role and responsibilities of family members as active partners in delirium prevention and management. The audiovisual format was selected based on its demonstrated superiority in dual-channel information processing, integrating visual and auditory modalities to enhance comprehension, engagement, and knowledge retention in non-clinical populations (Mayer, 2009). Participants in the intervention group were permitted to use their own personal devices to view the educational video under direct researcher supervision, ensuring consistent delivery conditions across sessions.

The control group received no educational intervention and was maintained under standard care conditions throughout the study period. Both groups completed the post-test assessment using the same CIDKQ instrument immediately following the intervention period, ensuring temporal consistency in measurement.

Phase 3: Evaluation

Upon completion of data collection, all questionnaire responses were reviewed for completeness and consistency. Data were entered and coded in SPSS for Windows for subsequent statistical analysis. Confidentiality was maintained throughout all phases of data handling in accordance with the ethical principles of beneficence, non-maleficence, autonomy, and justice.

Instruments and Data Collection

Knowledge of ICU delirium among family caregivers was measured using the Caregiver ICU Delirium Knowledge Questionnaire (CIDKQ), a 21-item multiple-choice instrument (yes/no/don't know) originally developed by Bull et al. (2015) (Karla D. Krewulak et al., 2020) and adapted for ICU settings by (Krewulak et al., 2020). The questionnaire covers three domains risk factors (items 1–10), management actions (items 11–16), and signs and symptoms (items 17–21) with total scores ranging from 0 to 21, categorized as no knowledge (0), low (1–7), moderate (8–14), or good (15–21). Prior to use, the instrument underwent forward and back translation into Bahasa Indonesia, expert content validation by two ICU charge nurses and a critical care nursing faculty member, and pilot testing on 35 caregivers; construct validity was confirmed via Pearson correlation ($r = 0.336–0.659$, all items $p < 0.05$, r -table = 0.334), and internal consistency was acceptable (Cronbach's $\alpha = 0.778$). The original CIDKQ has also demonstrated strong psychometric properties in the literature, with a scale-level content validity index of 0.86 and overall Cronbach's $\alpha = 0.77$ (Krewulak et al., 2020; Xue et al., 2022). Data were collected digitally via a QR-linked Google Form at two time points immediately before (pre-test) and after (post-test) the intervention in both groups, with the researcher present throughout to ensure standardized administration while maintaining participant confidentiality in accordance with established bioethical principles.

Variables

The independent variable in this study was the audiovisual health education intervention, while the dependent variable was the level of knowledge of family members regarding delirium. Knowledge levels were assessed quantitatively based on questionnaire scores and categorized into levels (e.g., low, moderate, and high) according to predefined criteria.

Data Analysis

Data analysis was performed using statistical software. Descriptive statistics were used to summarize participant characteristics and knowledge scores. Inferential statistics included the Wilcoxon Signed-Rank Test to analyze within-group differences (pre-test vs. post-test) and the Mann–Whitney U Test to compare differences between the intervention and control groups. A p -value of <0.05 was considered statistically significant.

Ethical Considerations

This study was conducted in accordance with established ethical standards for human research. Ethical approval was obtained from the Research Ethics Committee of RSD K.R.M.T. Wongsonegoro Hospital (Ref. No. 069/Kom.EtikRSWN/III/2025). All participants were provided with comprehensive information regarding the study objectives, procedures, potential risks, and benefits prior to participation. Written informed consent was obtained from all participants. Confidentiality and anonymity were strictly maintained throughout the study, and participants were assured of their right to withdraw at any time without any consequences to the care received.

RESULTS

A total of 72 participants were included in this study. The sample was predominantly middle-aged, with the largest proportion aged 45–59 years (45.8%), followed by 18–44 years (36.1%) and 60–75 years (18.1%). Female participants comprised the majority (66.7%). In terms of educational attainment, most participants had completed tertiary education (38.9%), while the remainder had primary (20.8%), secondary (19.4%), and higher education (20.8%). Regarding employment status, homemakers represented the largest group (36.1%), followed by entrepreneurs (23.6%) and other occupations (25.0%), whereas only a small proportion were unemployed (5.6%). With respect to relationship to the patient, most respondents were children (37.5%), followed by siblings (25.0%) and others (23.6%). Overall, the sample reflects a predominantly female, middle-aged, and relatively well-educated caregiving population with diverse socioeconomic roles that may influence health-related experiences (Table 1).

The effect of audiovisual-based health education on knowledge scores is presented in Table 2. A substantial and statistically significant improvement was observed in the intervention group, where mean knowledge scores increased from 7.86 ± 2.55 at baseline to 16.19 ± 3.46 post-intervention ($Z = 4.949$, $p < 0.001$), corresponding to a large effect size ($r = 0.70$). In contrast, the control group demonstrated only a modest and non-significant increase from 4.56 ± 1.78 to 6.28 ± 2.19 ($Z = 1.732$, $p > 0.05$), with a small effect size ($r = 0.24$).

Between-group analysis further confirmed the superiority of the intervention. The mean improvement in knowledge scores was markedly greater in the intervention group ($\Delta = 8.33$) compared to the control group ($\Delta = 1.72$), with a statistically significant difference ($Z = 7.062$, $p < 0.001$) and a large effect size ($r = 0.99$).

Taken together, these findings demonstrate that audiovisual-based health education yields both statistically significant and clinically meaningful improvements in knowledge. The magnitude and consistency of the effect underscore its potential as an effective educational strategy to enhance family understanding in clinical settings.

Table 1. Participant characteristics (n= 72)

Variable	n (%) or mean \pm SD
Age, years	
Age groups, years	1.81 \pm 0.72
18-44	26 (36.1)
45-59	33 (45.8)
60-75	13 (18.1)

Variable	n (%) or mean ± SD
Gender	
Male	24 (33.3)
Female	48 (66.7)
Educational attainment	
Primary	15 (20.8)
Secondary	14 (19.4)
Tertiary	28 (38.9)
Higher	15 (20.8)
Relationship to the patient	
Spouse	3 (4.2)
Parents	7 (9.7)
Sibling	18 (25)
Child	27 (37.5)
Other	17 (23.6)
Employment status	
Unemployed	4 (5.6)
Merchant	6 (8.3)
Entrepreneur	17 (23.6)
Homemaker	26 (36.1)
Healthcare profesional	1 (1.4)
Other	18 (25)

Note. Values are n (%) unless otherwise stated. Continuous variables are presented as mean±SD, SD, standard deviation

Table 2. Effect of Audiovisual Health Education on Knowledge Scores

Variable	Group	Pre test	Post test	Mean Difference	Z value	p-value
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		Mean ±SD	Mean ±SD			
Knowledge score	Intervention	7.86 ±2.55	16.19 ±3.46	8.13	4.95	<0.001
Knowledge score	Control	4.56 ±1.78	6.28 ±2.19	1.72	1.73	>0.05
Comparison between group	Intervention vs control	-	-	8.33 vs 1.72	7.06	<0.001

Note : Data are presented as mean ± standard deviation (SD). Within-group comparisons (pre-test vs post-test) were analyzed using the Wilcoxon signed-rank test, while between-group differences were assessed using the Mann–Whitney U test. A p-value of <0.05 was considered statistically significant. The intervention group demonstrated a substantially greater improvement in knowledge scores compared to the control group, indicating the effectiveness of audiovisual-based health education.

DISCUSSION

This study demonstrates that audiovisual-based health education is highly effective in improving knowledge among family caregivers, with both statistically significant and clinically meaningful effects. The substantial increase in knowledge scores observed in the intervention group, accompanied by a large effect size, indicates that the intervention produced robust and practically relevant outcomes. In contrast, the minimal and non-significant improvement in the control group suggests that conventional educational approaches may be insufficient to facilitate meaningful knowledge acquisition, consistent with prior evidence highlighting the limitations of passive learning strategies (Cook et al., 2011).

The effectiveness of audiovisual media can be explained through the Cognitive Theory of Multimedia Learning, which posits that individuals learn more effectively when information is delivered through both visual and auditory channels (Bali et al., 2026). By integrating narration, images, and structured content, audiovisual interventions enhance cognitive processing, attention, and retention. Previous studies have demonstrated that multimedia-based education significantly improves knowledge and comprehension compared to traditional methods in healthcare settings (Wang et al., 2025). These findings support the present results, where participants exposed to audiovisual materials achieved markedly higher knowledge gains.

Furthermore, this study aligns with Social Cognitive Theory, particularly the concept of self-efficacy (Bandura, 1991). Although self-efficacy was not directly measured, improved knowledge may contribute to increased confidence in managing health-related situations. Evidence suggests that educational interventions can enhance caregiver competence and engagement by strengthening knowledge and perceived control (Li et al., 2025). In the context of delirium care, improved understanding may enable caregivers to recognize early symptoms, respond appropriately, and participate actively in patient management.

Sociodemographic characteristics may also have influenced the outcomes. The predominance of middle-aged, female, and relatively well-educated participants reflects a caregiving population that is actively engaged and potentially more receptive to educational interventions. Previous studies have shown that higher educational attainment is associated with better health

literacy and information processing, which may enhance the effectiveness of structured education programs (Alliston et al., 2024). However, variability in employment and family roles suggests the need for flexible and accessible educational approaches, such as audiovisual media, that can accommodate diverse caregiving contexts.

From a clinical perspective, the findings underscore the importance of integrating technology-based education into routine care. Audiovisual interventions provide a scalable and standardized approach that ensures consistent information delivery while allowing repeated access for reinforcement (Verville et al., 2021). This is particularly relevant in busy clinical environments where time constraints may limit direct education by healthcare professionals.

Nevertheless, several limitations should be acknowledged. The quasi-experimental design limits causal inference, and the relatively small sample size may reduce generalisability. In addition, the study focused on knowledge outcomes without assessing behavioural changes or patient-related outcomes. Future studies should adopt longitudinal and interventional designs to examine whether improved knowledge translates into better caregiving practices and patient outcomes. Incorporating psychosocial variables such as self-efficacy, caregiver burden, and anxiety would also provide a more comprehensive understanding of intervention mechanisms (Guo et al., 2025; Kocabaş et al., 2025).

CONCLUSION

Audiovisual-based health education is an effective intervention for improving knowledge among family caregivers of ICU patients. The findings demonstrate significant and clinically meaningful improvements in knowledge scores, with a large effect size compared to standard care. This highlights the potential of audiovisual education as a practical, scalable, and engaging strategy to enhance family involvement in delirium prevention and management. Integrating such interventions into routine clinical practice may contribute to improved caregiving quality and patient outcomes in critical care settings. Furthermore, the intervention was delivered only once, preventing evaluation of long-term knowledge retention and sustainability. The use of self-report questionnaires with closed-ended items may not fully capture deeper understanding or cognitive processing. Finally, potential confounding factors, such as prior exposure to health information and informal support systems, were not controlled. Future studies should employ randomized designs, larger samples, and longitudinal approaches to strengthen evidence and assess long-term impact.

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CONFLICTS OF INTEREST

The authors declare that there are no conflicts of interest related to this study. This research was conducted independently without any financial or commercial relationships that could be construed as a potential conflict of interest.

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