MSC Journal Of Medical Surgical Concerns
ISSN 2797-8400 (Print)
ISSN 2797-8419 (Online)
Doi: 10.56922

NOMOR 286/DST/C3/HM.01.00/26

ARTICLE INFORMATION
Received: June, 15, 2026
Revised: June, 25, 2026
Available online: June, 30, 2026
at: https://e-jurnal.iphorr.com/index.php/msc

Leaflet and digital poster education to improve family knowledge and attitudes toward pediatric fall prevention

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Abstract

Background: Falls are preventable patient-safety events that can cause injury, prolong hospitalization, and increase the burden on children, families, and healthcare services. Family caregivers require clear and accessible education to participate effectively in fall-prevention practices during pediatric hospitalization.
Purpose: To compare the effects of education using a leaflet plus a digital poster with education using a leaflet alone on family caregivers' knowledge and attitudes toward pediatric fall prevention.
Method: This quasi-experimental study used a pretest-posttest control-group design. Eighty-eight family caregivers of pediatric inpatients were recruited through purposive sampling and allocated to an intervention group (n = 44) or a control group (n = 44). The intervention group received education using a leaflet and a digital poster, whereas the control group received leaflet-based education. Knowledge and attitude scores were assessed before and after the intervention. Within-group changes were analyzed using paired-samples t tests, and between-group differences were examined using an independent-samples t test.
Results: Knowledge and attitude scores increased in both groups after education, with larger improvements in the combined-media group. In the intervention group, the mean knowledge score increased from 44.03 to 87.64 and the mean attitude score increased from 55.87 to 87.69. In the control group, the corresponding scores increased from 43.47 to 70.17 and from 53.41 to 73.39. All within-group changes were statistically significant ($p < 0.05$), and the post-intervention difference between groups was also significant.
Conclusion: Education combining a leaflet and a digital poster produced greater improvements in family caregivers' knowledge and attitudes toward pediatric fall prevention than leaflet-based education alone. The combined approach may be incorporated into family-centered patient-safety education in pediatric inpatient settings.

Keywords: Digital Poster; Family Education; Knowledge; Leaflet; Pediatric Fall Prevention.

INTRODUCTION

Falls are a major cause of unintentional injury and remain an important patient-safety concern. Children are particularly vulnerable because developmental curiosity, increasing mobility, and limited hazard recognition can increase exposure to unsafe situations. In hospital settings, a fall may result in bruising, fracture, head injury, emotional distress, prolonged hospitalization, and additional healthcare costs (World Health Organization, 2021; Schaffer, Daraiseh, Daum, Mendez, Lin, & Huth, 2012; Adhelna, Jannah, Yusuf, Putra, & Yullyzar, 2024).

Pediatric fall prevention requires more than risk identification. Effective programs commonly combine risk assessment, environmental safeguards, visual alerts, staff practices, and the participation of patients and families (Stubbs & Sikes, 2017; LeLaurin & Shorr, 2019). A systematic review of pediatric inpatient

DOI: https://doi.org/10.56922/msc.v6i2.3579

programs found substantial variation in intervention content and limited experimental evidence, highlighting the need for practical and standardized approaches that can be implemented consistently in clinical care (Kim, Kim, & Lim, 2021).

Family caregivers are central to pediatric safety because they frequently remain at the bedside and assist children with mobility, toileting, play, and daily activities (Zulviani & Ariyani, 2024). Their knowledge and attitudes may influence whether safety measures are followed, including maintaining bed rails, requesting assistance, supervising mobility, and keeping the bedside environment free from hazards. Patient- and family-engaged fall-prevention strategies have been associated with improved alignment between assessed risk and preventive actions (Dykes, Burns, Adelman, Benneyan, Bogaisky, Carter, & Bates, 2020).

Education is therefore an essential component of hospital fall-prevention programs (Haines, Hill, Hill, Brauer, Hoffmann, Etherton-Beer, & McPhail, 2013; Alxenia, Wulandari, Elasari, & Kurniawan, 2024). Evidence from hospital settings suggests that well-designed education can improve knowledge, risk awareness, and engagement in preventive behaviors, particularly when messages are tailored and supported by appropriate educational resources (Heng, Jazayeri, Shaw, Kiegaldie, Hill, & Morris, 2020; Hill, Francis-Coad, Vaz, Morris, Flicker, Weselman, & Hang, 2024). A systematic review and meta-analysis also identified patient and staff education as one of the few hospital interventions associated with significant reductions in falls (Morris, Webster, Jones, Hill, Haines, McPhail, & Cameron, 2022).

Printed leaflets are inexpensive, portable, and suitable for repeated reading, while digital posters can reinforce key messages through concise text and visual cues. The effectiveness of these media depends on content, design, delivery, and the learner's opportunity to engage with the information. Combining media may provide stronger reinforcement than using a single printed format alone (Hasanica, Ramic-Catak, Mujezinovic, Begagic, Galijasevic, & Oruc, 2020; Houts, Doak, Doak, & Loscalzo, 2006; Sustersic, Gauchet, Foote, & Bosson, 2017).

At Adventist Hospital Bandar Lampung, fall-prevention education for families had primarily relied on leaflets, while digital posters had not been routinely incorporated. The study therefore compared leaflet-plus-digital-poster education with leaflet-only education to determine whether combined media produced greater improvements in family caregivers' knowledge and attitudes toward fall prevention among pediatric inpatients.

RESEARCH METHOD

This study used a quasi-experimental pretest-posttest control-group design and was conducted in the pediatric inpatient ward of Adventist Hospital Bandar Lampung. Eighty-eight family caregivers of hospitalized children were recruited through purposive sampling. The intervention group included 44 participants who received leaflet and digital poster education, while the control group included 44 participants who received leaflet education only.

The intervention group received a printed leaflet and a digital poster containing information on pediatric fall risk, environmental hazards, supervision, bed-rail use, safe mobilization, toileting assistance, and communication with nursing staff. The control group received the same core information through a printed leaflet without the digital poster component.

Knowledge and attitude were measured using study questionnaires administered before and after the educational intervention. Higher scores indicated better knowledge and more favorable attitudes toward pediatric fall prevention.

Descriptive statistics were used to summarize participant characteristics and outcome scores. Normality was assessed using the Kolmogorov-Smirnov test. Within-group pretest-posttest changes were examined using paired-samples t tests, and post-intervention differences between groups were examined using an independent-samples t test. Statistical significance was set at $p < 0.05$.

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RESEARCH RESULTS

Table 1. Characteristics of Family Caregivers and Pediatric Patients (N = 88)

Variable	Results
Caregiver age (years)	
Mean ± SD (range)	31.32 ± 7.66 (17–45)
17–25	24/27.3
26–35	34/38.6
36–45	30/34.1
Gender	
Male	10/11.4
Female	78/88.6
Educational Level	
Primary school	15/17.0
Junior high school	19/21.6
Senior high school	28/31.8
Higher education	26/29.6
Employment status	
Homemaker/not employed	65/73.9
Laborer/farmer	3/3.4
Self-employed	9/10.2
Private-sector employee	8/9.1
Civil servant/military/police	3/3.4
Child's age (years)	
5–7	64/72.7
8–10	24/27.3

Table 1 shows that the mean age of the family caregivers was 31.32 ± 7.66 years (range, 17–45 years). The largest age group was 26–35 years (n = 34, 38.6%), and most caregivers were female (n = 78, 88.6%). Most respondents were homemakers or not formally employed (n = 65, 73.9%), and most hospitalized children were aged 5–7 years (n = 64, 72.7%).

Inferential Analysis of Knowledge and Attitude Scores

Before inferential analysis, the Kolmogorov–Smirnov test was used to assess the distribution of the knowledge and attitude scores. All normality-test p values exceeded 0.05, indicating that the scores in the intervention and control groups were approximately normally distributed and met the assumptions for parametric testing.

Table 2. Comparison of Knowledge and Attitude Scores Before and After Education

Outcome and group	Pretest, mean ± SD	Posttest, mean ± SD	Within-group p value	Between-group p value
Knowledge score				
Intervention (n = 44)	44.03 ± 6.25	87.64 ± 7.81	0.008	< 0.001
Control (n = 44)	43.47 ± 7.81	70.17 ± 7.81	0.012	—

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Attitude score				
Intervention (n = 44)	55.87 ± 9.90	87.69 ± 5.21	0.001	< 0.001
Control (n = 44)	53.41 ± 13.54	73.39 ± 5.21	0.002	—

Table 2 shows that both educational approaches were associated with higher knowledge and attitude scores. In the intervention group, the mean knowledge score increased from 44.03 ± 6.25 to 87.64 ± 7.81 (p = 0.008), while the mean attitude score increased from 55.87 ± 9.90 to 87.69 ± 5.21 (p = 0.001). In the control group, the mean knowledge score increased from 43.47 ± 7.81 to 70.17 ± 7.81 (p = 0.012), and the mean attitude score increased from 53.41 ± 13.54 to 73.39 ± 5.21 (p = 0.002). Postintervention scores differed significantly between the groups for both knowledge and attitude (both p < 0.001), with higher scores in the combined-media intervention group.

DISCUSSION

This study found that education improved family caregivers' knowledge and attitudes toward pediatric fall prevention in both groups, with larger gains among participants who received the leaflet plus digital poster. The findings support the use of multimodal educational resources to reinforce safety messages during pediatric hospitalization.

The participant profile was dominated by women and caregivers aged 26-35 years. This pattern is consistent with the practical caregiving role commonly assumed by mothers and other female family members during pediatric hospitalization. Because caregivers remain close to the child and frequently assist with daily activities, their understanding of fall-prevention measures is directly relevant to bedside safety.

The increase in knowledge following education is consistent with evidence that hospital fall-prevention education can improve awareness of risk factors and preventive actions. Educational materials are most useful when they provide concise, actionable instructions and are delivered at a time when patients or caregivers are able to engage with the information (Heng et al., 2020; Hill et al., 2024).

The improvement in attitude suggests that the intervention influenced not only factual understanding but also caregivers' readiness to participate in prevention. Positive attitudes are important because family members must translate information into practical behaviors, such as maintaining bed rails, supervising mobility, requesting nursing assistance, and reducing environmental hazards. Patient- and family-centered tools that link identified risks to specific actions can strengthen participation in fall prevention (Dykes et al., 2020).

The greater improvement in the combined-media group may reflect reinforcement through complementary formats (Surastiningsih, Ulfa, & Aprillia, 2025). The leaflet allowed caregivers to review the information repeatedly, while the digital poster emphasized key points visually. Previous research has shown that the design and mode of educational delivery affect engagement and learning outcomes, and that combining written and visual strategies may be more effective than relying on a single medium (Hasanica et al., 2020; Heng et al., 2020; Wulandari & Elasari, 2025).

The findings should be interpreted in the context of pediatric fall-prevention evidence. Programs for hospitalized children often include family education, risk alerts, environmental safeguards, and staff practices, but the available evidence remains heterogeneous (Kim et al., 2021). The present study contributes local evidence that combined educational media can strengthen caregiver knowledge and attitudes, although further research is needed to determine whether these changes reduce actual fall events (Mu'alifah, Usastiawaty, & Kusumaningsih, 2025).

This study has limitations. The purposive sample was drawn from a single hospital, and outcomes were measured over a short period using self-reported questionnaire scores. The study evaluated knowledge and attitudes rather than observed prevention behaviors or fall incidence. Future studies should use validated instruments, longer follow-up, and behavioral or clinical outcomes.

CONCLUSION

Education using either a leaflet alone or a leaflet combined with a digital poster improved family caregivers' knowledge and attitudes toward pediatric

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fall prevention. The combined-media intervention produced greater improvements than leaflet education alone, indicating that visual reinforcement may strengthen family-centered patient-safety education in pediatric inpatient care.

SUGGESTION

Future studies should evaluate the intervention in multiple hospitals, use validated knowledge and attitude instruments, and assess whether improvements are sustained over time and translated into observable preventive behavior and lower fall rates (Anggraeni & Susanti, 2025). Studies should also compare alternative digital formats and identify the most effective timing, duration, and method of education delivery for family caregivers.

ACKNOWLEDGMENTS

The authors thank the participating family caregivers, the pediatric ward staff, and Adventist Hospital Bandar Lampung for their support during the study.

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