e-ISSN : 2597-6052

MPPKI MEDIA PUBLIKASI PROMOSI KESEHATAN INDONESIA

Research Articles Open Access

Enhancing Health Literacy and Family Competency in Post-Stroke Care Through Health Education: A Community-Based Intervention

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ARTICLE INFO

Manuscript Received: 29 Apr, 2025
Revised: 13 Jul, 2025
Accepted: 20 Jul, 2025
Date of Publication: 12 Aug, 2025
Volume: 8
Issue: 8
DOI: 10.56338/mppki.v8i8.7937

KEYWORDS

Health Education;
Knowledge;
Skills;
Post-Stroke Care;
Family

ABSTRACT

Introduction: The lack of knowledge and skills among family members in caring for post-stroke patients can prolong the recovery time and increase the risk of complications. Health education is essential to enhance understanding and optimize caregiver skills. This study examines the effect of structured health education on the knowledge and caregiving skills of families caring for post-stroke patients at the Poncokusumo Community Health Center, Malang.
Methodology: This research employed a pre-experimental design with a total population of 35 families with the post stroke patients at Poncokusumo Community Health Center , from which 32 participants were selected using purposive sampling. The research instrument consisted of a questionnaire, and data were analyzed using the Wilcoxon test.
Results: The results show that before the health education intervention, half of the participants had a moderate level of knowledge (16 people, 50.0%). After the intervention, nearly all participants demonstrated good knowledge (28 people, 87.5%). In terms of skills, before the intervention, the majority of participants had poor caregiving skills (19 people, 59.4%). After the intervention, most participants improved to a moderate skill level (19 people, 59.4%). There was a significant effect of health education on family knowledge regarding post-stroke care at Poncokusumo Community Health Center, with a p-value of 0.000 (<0.05).
Conclusion: Health education is effective in improving family knowledge and skills in caring for post-stroke patients. With structured education, families understand how to care for patients, from mobilization and complication prevention to psychosocial support. Direct training and educational media help them apply skills with more confidence. This increased understanding contributes to better quality of care, accelerates patient recovery, and reduces the risk of complications.

Publisher: Fakultas Kesehatan Masyarakat Universitas Muhammadiyah Palu

INTRODUCTION

Stroke is a neurological condition that results in partial or complete paralysis and may lead to death due to the disruption of blood flow in the brain, ultimately causing cerebral tissue damage (1-3). It is clinically defined as a sudden loss of brain function with symptoms lasting more than 24 hours or leading to death, primarily due to vascular causes such as thrombosis or hemorrhage (4). The pathophysiology of stroke involves obstruction or rupture of blood vessels that supply oxygen to the brain, resulting in hypoxic damage to regions responsible for voluntary motor control (5). Globally, stroke remains the leading cause of long-term disability and the second most common cause of mortality after ischemic heart disease (6,7). However, it is estimated that approximately 90% of stroke cases are preventable through adequate management of modifiable risk factors such as hypertension, smoking, unhealthy diet, physical inactivity, diabetes mellitus, and atrial fibrillation (8-11).

According to the 2023 Indonesian Health Survey (SKI the national prevalence of stroke reached 8.3 per 1,000 individuals aged over 15 years. Yogyakarta Province reported the highest prevalence at 11.4 per 1,000 population, followed by North Sulawesi with 11.3 and DKI Jakarta with 10.7 per 1,000. West Java and East Kalimantan recorded identical rates at 10.3 per 1,000, all exceeding the national average (12) In the local context, preliminary data from the Poncokusumo Community Health Center documented 36 new stroke cases in 2023 (0.56%), which increased to 41 new cases (0.95%) within the first seven months of 2024, indicating a rising trend (13). A formative survey conducted in the same area involving 10 family members of post-stroke patients revealed that 8 participants reported insufficient knowledge regarding home care, while 2 expressed disinterest in acquiring such information (14-16). Post-stroke patients are highly dependent on the people around them, particularly family members, who often serve as the primary caregivers. Family plays a pivotal role in the recovery process due to their proximity, familiarity with the patient's condition, and continuity of care (17). Stroke not only affects the patient but also profoundly impacts family dynamics—often resulting in role disruption and increased psychosocial burden. Unfortunately, many family members receive minimal education during hospitalization regarding appropriate stroke care. Nurses often lack the time or structured protocols to provide comprehensive discharge education, leaving caregivers underprepared. As a result, families frequently return home without adequate knowledge or skills to assist the patient, particularly when only one person bears the responsibility of care (18).

Given these challenges, health education becomes essential. Stroke survivors typically require assistance with activities of daily living (ADLs), including bathing, dressing, feeding, and mobility**.** Families must be equipped with the competencies necessary to prevent complications and support the patient's functional recovery. Health education is defined as a planned process that enables individuals or groups to improve knowledge and adopt behaviors that promote health. For caregivers, the provision of tailored, interactive education using appropriate techniques and media such as counseling and leaflets has been shown to increase both understanding and confidence (18).

Based on these considerations, this study aims to examine the effect of health education on family knowledge and caregiving skills in post-stroke care. The results are expected to inform future strategies to empower families in supporting patient rehabilitation and improving quality of life outcomes.

METHOD

Design

This study applied a pre-experimental research method with a one-group pretest-posttest design, which is commonly used to assess the effect of an intervention by comparing outcomes before and after the treatment within the same group. This design was selected due to its feasibility in real-world health service settings and its appropriateness for evaluating the impact of educational interventions without requiring a control group. In this design, participants were observed at two time points: before the health education intervention (pretest) and after its completion (posttest). This approach allows for the measurement of changes in participants' knowledge and skills regarding post-stroke care, attributing improvements to the health education provided. Although this design lacks randomization and control comparison, it remains a valid method for preliminary investigation and community-based intervention studies, especially when ethical or logistical constraints limit the use of more rigorous experimental designs.

Participants

The target population consisted of 35 families with post-stroke patients registered at the Poncokusumo Community Health Center. A total of 32 families who met the inclusion criteria and agreed to participate until the study was completed were selected as the sample using purposive sampling. The inclusion criteria included: (1) family members aged 18 years or older, (2) those living in the same household as the post-stroke patient, (3) primary caregivers who were directly involved in daily patient care activities, and (4) those who were willing and able to participate in the education sessions and complete the questionnaires.

Intervention

The intervention in this study consisted of structured health education sessions designed to improve the knowledge and caregiving skills of family members responsible for post-stroke patient care. The educational content was developed based on standard post-stroke rehabilitation guidelines and focused on four key domains: (1) daily care activities (e.g., bathing, dressing, feeding), (2) prevention of complications such as pressure sores, aspiration, and joint contractures, (3) safe mobilization techniques including repositioning and assisted ambulation, and (4) provision of emotional and psychosocial support to promote the patient's mental well-being. Health education was delivered through individual counseling sessions, supported by visual media (leaflets and illustrated modules) to enhance comprehension and retention. Each session lasted approximately 30 to 45 minutes and was conducted face-to-face by trained health educators at the Poncokusumo Community Health Center. Family members were encouraged to ask questions and demonstrate learned caregiving tasks under supervision to ensure the transfer of knowledge into practice. The intervention was implemented over a single visit, but included follow-up reinforcement through brief home visits or telephone counseling when needed, to monitor application of skills in real settings. This intervention strategy was chosen to accommodate the availability and literacy levels of caregivers while maximizing relevance to real-life caregiving challenges. The structured format aimed to ensure consistent delivery of key messages and promote caregiver confidence and autonomy in managing post-stroke recovery at home.

Statistical Analysis

Data were collected using structured and validated questionnaires designed to assess participants' levels of knowledge and caregiving skills related to post-stroke patient care. Pretest measurements were taken prior to the health education intervention, and posttest measurements were conducted afterward to evaluate changes attributable to the intervention. The collected data were entered, cleaned, and analyzed using IBM SPSS Statistics version 26. Descriptive statistics, including frequencies and percentages, were used to summarize respondent characteristics and distributions of knowledge and skill levels before and after the intervention. To assess the effectiveness of the intervention, the Wilcoxon Signed-Rank Test was applied as a non-parametric alternative to the paired t-test, appropriate for ordinal data and non-normally distributed variables. The level of statistical significance was set at $p < 0.05$. This analytical approach enabled the researchers to identify significant differences in knowledge and skills pre- and post-intervention, thereby evaluating the impact of the health education provided to caregivers.

Ethics Approval

This study was conducted in accordance with the principles of the Declaration of Helsinki and adhered to ethical standards in research involving human participants. Ethical approval was obtained from the Health Research Ethics Committee of Universitas Strada Indonesia, with registration number 001875/EC/KEPK/I/3/2024, dated August 3, 2024. Prior to data collection, informed consent was obtained from all participants after they were given an explanation regarding the study objectives, procedures, potential benefits, and their rights to withdraw at any stage without penalty. Confidentiality of the participants' identities and responses was strictly maintained. All data were anonymized and used solely for research purposes. The researchers ensured that participation was voluntary and that no coercion or undue influence was involved during recruitment.

RESULTS

Respondent Characteristics

Table 1. Respondent Characteristics

Age	Frequency	Percent (%)
17 - 25 years	3	9.4
26 – 35 years	7	21.9
36 – 45 years	7	21.9
>45 years	15	46.9
Education		
Elementary school	1	3,1
Junior high school	6	18.8
Senior high school	19	59.4
Bachelor	6	18.8
Job		
None	3	9.4
Housewife	15	46.9
Farmer	4	12.5
Enterpreuner	7	21.9
Retired	3	9.4

Based on table 1 above, it is known that most of the respondents were > 45 years old as much as 15 (46.9 %), it is known that most of the respondents were senior high school as much as 19 (59.4 %), Based on table 1 above, it is known that most of the respondents were housewife as much as 15 (46.9 %).

Table 2. Characteristics of respondents' knowledge level based on before and after health education conducted at Poncokusumo Community Health Center

Knowledge	Before		After	
	Frequency (F)	Percent (%)	Frequency (F)	Percent (%)
Less	4	12.5	0	0.00
Moderate	16	50.0	4	12.5
Good	12	37.5	28	87.5
Total	32	100	32	100

Based on table 2, it is known that almost all respondents before being given health education moderate knowledge level as much as 16 (50%) than after being given health education had a good level of knowledge as much as 28 (87.5%).

Table 3. Characteristics of respondents' Skill level based on before and after health education conducted at Poncokusumo Community Health Center

Skill	Before		After	
	Frequency (F)	Percent (%)	Frequency (F)	Percent (%)
Less	19	59.4	0	0.00
Moderate	12	37.5	19	59.4
Good	1	3.1	13	40.6
Total	32	100	32	100

Based on table 3, it is known that almost all respondents before being given health education less skill levels as much as 19 (59.4%) than after have a moderate skill level as much as 19 (59.4%).

Table 4. Analysis of knowledge and skill at Poncokusumo Community Health Center

Variable	Knowledge &skill Category			Total	N	P Value
	Low	Moderate	Good			
knowledge before health education	4	16	12	10%	332	0.000
knowledge after health education	0	4	28			
skills before health education	19	12	1			
skills after being given health education	0	19	13			

***Wilcoxon Signed-Rank Test (p < 0.05)**

Based on table 4 it is known that there are changes in the knowledge and skills at Poncokusumo Community Health Center before and after being given health education. The results of the above study using the Wilcoxon Sign Rank Test with a p-value of 0.00 (a <0.05) so that H0 is rejected, meaning that there is a difference in knowledge and skills before and after being given health education.

DISCUSSION

Health Education and Family Knowledge Improvement in Post-Stroke Care: A Health Promotion Perspective at Poncokusumo Community Health Center

The findings of this study indicate a substantial improvement in family health literacy following structured health education. Rather than restating specific numerical outcomes, it is more important to emphasize that the majority of participants transitioned from limited to strong knowledge levels after the intervention. This underscores the effectiveness of health education in promoting informed caregiving within family settings. Health education empowers families to better comprehend the complex needs of post-stroke patients, who often face multifaceted physical, psychological, and social challenges. Stroke survivors may experience impaired mobility, speech difficulties, and dependency in daily living activities. These impairments require consistent and knowledgeable care to prevent complications and support recovery trajectories (19). When equipped with sufficient knowledge, family caregivers become central actors in early detection of complications and long-term rehabilitation success. Studies have shown that well-informed families are better able to perform daily care, provide emotional support, and reduce the risk of re-hospitalization (20,21). From a health promotion standpoint, educational interventions must address not only cognitive understanding but also emotional readiness and behavioral competencies. In this study, families demonstrated improved conceptual grasp of stroke management, enhanced empathy, and increased readiness to apply care routines at home. These three domains cognitive, affective, and psychomotor reflect key dimensions in behavior change models and health promotion frameworks. Therefore, health education served as a transformative intervention, building community capacity for chronic care management.

Promoting Health Behavior through Skill Enhancement in Post-Stroke Family Care at Poncokusumo Community Health Center

This study also showed marked improvements in family caregiving skills following targeted health education. While exact percentages were reported in the results section, the discussion here focuses on the functional implications: participants gained confidence and competence in handling basic caregiving tasks. Health education that includes demonstration, practice, and supervision supports behavioral change through active learning. According to Bandura's social learning theory, behavior acquisition is facilitated when learners observe, internalize, and perform modeled actions (22). Our intervention strategy aligned with this model by enabling families to practice real caregiving actions such as repositioning, assisting feeding, and communication support under guidance. Notoatmodjo similarly argues that experiential education, when tailored to the learner's context and needs, produces stronger behavioral outcomes (23). This is supported by Rahmawati et al. (24), who demonstrated that practical-based caregiver training leads to better performance in post-stroke home care. Thus, the observed improvement is not merely statistical but represents an enhancement in real-world caregiving capacity. This underscores the value of embedding health education in post-stroke discharge planning and community health programming.

Integrated Impact of Health Education on Family Knowledge and Skills: Implications for Health Promotion Strategy

Based on the results of this study, it shows that there is a significant influence of health education on increasing family knowledge in carrying out post-stroke care. The results of statistical analysis show a p-value of 0.000 (<0.05), which indicates that health education interventions have a real impact on family knowledge. This increase is important to support the quality of post-stroke patient care, considering the role of the family is very crucial in the process of patient rehabilitation and recovery. Research by Lestari found that family-based health education can improve knowledge and skills in caring for post-stroke patients. The study showed a 75% increase in knowledge after educational intervention using modules and simulations (25).

These results are relevant to the finding that providing structured and needs-based information can improve the family's ability to support the recovery process of post-stroke patients. The researchers argue that health education has a significant influence on increasing family knowledge in caring for post-stroke patients at Dian Harapan Hospital Jayapura. This confirms that proper education can equip families with a better understanding of the patient's condition, the care needed, and how to overcome various challenges that may arise during the recovery process. With increased knowledge, families can provide more optimal care, support patient independence, and prevent complications that can worsen health conditions. These findings emphasize the importance of health education as an integral part of post-stroke patient management, so it needs to be continuously improved so that families are better prepared to provide ongoing support. Based on the results of this study, it shows that health education has a significant effect on improving family skills in providing post-stroke care.

Statistical analysis produced a p-value of 0.000 (<0.05), which indicates that health education interventions are effective in improving family skills. This finding emphasizes the importance of health education as an intervention step to improve the quality of post-stroke patient care, especially in supporting daily care needs. Research by Putri found that family skills training in post-stroke care through demonstrations and intensive assistance increased family skills by 80%. This study also showed that families who were given direct practice-based education were more confident and able to carry out care actions such as passive movement exercises and nutritional management. The results of this study support the finding that practice-based health education is effective in improving family skills (26-30). The education provided not only increases the family's understanding of the patient's condition, but also equips them with practical skills in assisting the patient's mobility, communication, nutritional intake, elimination, and personal hygiene. With these increased skills, families can be more confident in providing appropriate care, reducing the risk of complications, and supporting optimal patient recovery. These findings emphasize that health education should be an important part of post-stroke patient support, so that families can play an active role in improving the patient's quality of life.

CONCLUSION

This study involving 32 respondents demonstrated that structured health education has a significant effect on improving both knowledge and caregiving skills among families of post-stroke patients at Poncokusumo Community Health Center. Prior to the intervention, the majority of participants exhibited only moderate levels of knowledge and low caregiving skills. However, following the health education intervention, there was a marked increase, with most participants achieving good knowledge and moderate to high levels of caregiving skills. The results of the Wilcoxon Signed-Rank Test revealed a statistically significant difference in both knowledge and skill scores before and after the intervention ($p < 0.05$), confirming the effectiveness of the educational program. These findings highlight the critical role of targeted health education in empowering families to provide competent and informed care to post-stroke patients at home.

Accordingly, health education should be integrated as a routine part of discharge planning and community-based stroke rehabilitation programs to ensure sustainable improvements in post-stroke outcomes and quality of life.

AUTHOR'S CONTRIBUTION STATEMENT

Rahmania ambarika conceptualized the study, developed the research framework, and led manuscript preparation. Contributed to the theoretical formulation and supervised data interpretation. Novita ana coordinated data collection and statistical analysis and instrument design. Herman adhi provided administrative support, reviewed

institutional compliance, and refined the final manuscript. All authors have read and approved the final version of the manuscript

DECLARATION OF GENERATIVE AI AND AI-ASSISTED TECHNOLOGIES IN THE WRITING PROCESS

All Author declare no utilize generative AI or AI Assited technologies.

SOURCE OF FUNDING STATEMENT

This research received no external funding or sponsorship. All costs associated with the study were borne by the authors.

ACKNOWLEDGMENTS

The authors would like to express their sincere gratitude to the Poncokusumo Community Health Centre in Malang Regency for their participation and support.

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