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Original Article

Adaptive Family-Based Stroke Prevention in Communities: A Systematic Review

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Abstract

Objective: this study aimed to identify a stroke prevention model with a family approach.

Methods: this systematic review is based on the 2015 Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) guideline. Articles were obtained from the PubMed and Google Scholar databases. Each article was assessed using eight criteria from the Strengthening the Reporting of Observational studies in Epidemiology (STROBE): sample size, sampling technique, response rate, outcome measures, statistical analysis, use of confounding, study limitations, and ethical considerations. 8 out of 2065 articles were used to develop this study.

Results: family support plays an important role in shaping stroke prevention behavior, both primary and secondary, through risk factor management and knowledge provision.

Conclusions: family support is one of the approaches to stroke prevention in reducing the burden of stroke. Stroke prevention by the family can be achieved by educating patients about stroke and providing support and encouragement for risk factor management.

Keywords: stroke, prevention, family, knowledge, risk factor.

INTRODUCTION

Stroke is the second leading cause of death in the world with a rate of 85%, mostly in low- and middle-income countries.1 Cardiovascular disease and poor lifestyle are risk factors for stroke.2,3 Poor habits contribute 90% to the incidence of stroke.4 Long recovery time and high cost of stroke treatment become an economic burden for the patient, the patient's family and the country.5–7

The burden of stroke increases if there is a relapse. Patients with stroke have a high risk of recurrent stroke.8 The number of recurrent strokes increases with the length of time, which is around 3-40%.5 Primary and secondary prevention of stroke is needed to reduce the burden of stroke.8

Primary prevention is carried out by adopting a healthy lifestyle and identifying and managing risk factors.9 Meanwhile, secondary prevention is carried out by modifying modifiable risk factors, antiplatelet therapy for non-cardioembolic ischemic stroke, anticoagulation for cardioembolic stroke and intervention for symptomatic carotid stenosis.10 Optimal secondary prevention therapy can prevent recurrent stroke by up to 80%.11

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This shows that stroke can be prevented by planning and implementing the best strategies.12 Social support from family has a positive effect on disease prevention and self-management.13

Family caregivers can improve medication adherence, diet, and alertness in routine control.14 The Family Adaptive Behavior model is an effective model for implementing family-based stroke prevention strategy. This model is built upon the principle that families can to adapt to various stimuli that may affect the health of family members.15 Support and knowledge from the family can motivate patients at risk of stroke to commit to prevention.16 Therefore, this study aimed to identify an adaptive family-based stroke prevention model.

Methods

Search Strategy

This systematic review referred to the 2020 Preferred Reporting Items for Systematic Review and Meta Analysis (PRISMA) guideline.17 The literature sources were the PubMed and Google Scholar databases. The search included worldwide research published in 2011-2022. Articles retrieved from each database were imported into Mendeley. The combination of keywords used in the search was "stroke". "prevention", "family", and "risk factors".

Inclusion and Exclusion

The inclusion criteria of the article were (a) the study sample was stroke patients or families of patients at risk of stroke; (b) discussing the role of the family in the prevention of stroke; (c) quantitative research; (d) written in English; and (e) published from July 2011-July 2022.

Data Extraction

The extracted data were variables related to the role of the family in preventing the incidence of stroke. All articles were imported into Mendeley and duplication selection was performed and followed by reading the title and abstract. The appropriate articles were further selected based on the inclusion and exclusion criteria. Selected articles were re-sorted by reading the entire contents of the article. Selected articles were included in the synthesis table.

Quality Assessment

The STROBE (Strengthening the Reporting of Observational Studies in Epidemiology) was used to assess the reviewed studies. Of the 22 STROBE assessment items, 8 items were taken, namely: description of sample size, description of sample methodology, response rate calculation, outcome measurement, description of statistical analysis, confounding control, description of study limitations, and research ethics. The study quality categories were measured based on the number of items met. Each item met was given a score of 1. The overall scores were added up to determine the quality of the studies. The study quality was categorized into poor (0-3), moderate (4-6), and good (7-8).18 Articles that are included in the good category can be assessed further.

Results

A total of 2065 articles were gathered from PubMed and Google Scholar. 1050 articles obtained after deleting duplicate articles. After title screening, 1012 articles were excluded. Furthermore, 15 articles were excluded after reading the abstracts. Finally, 8 articles were obtained to compose this systematic review. The table shows a summary of the studies; 4 studies in America, 3 studies in Asia, and 1 study in Africa. The sample size ranged from 160 to 1259 participants and all studies were rated of moderate to good quality. The collected studies showed that family support played an important role in shaping stroke prevention behavior both primary and secondary through risk factor management and improving knowledge.

Table 1. Summary of Selected Studies and Conclusions of Research Results

No.	Author, Year, Country	Study Design	Sample	Journal Name	Intervention Method	Quality Assessment	Finding
1.	(Cabral et al, 2012) Brazil / USA	Randomized clinical trial	594 stroke patients	*American Journal of Public Health*	FHP intervention (*Family Health Program*) with visits from health workers, checking medical history, and making workshops	6	Patients in the FHP group had a lower incidence of stroke (30.1%) than the non-FHP group (36.2%).
2.	(Kronish et al, 2014) New York /	Randomized clinical trial	600 stroke patients or TIA	Stroke	Peer education interventions, weekly 6-week workshops with a chronic disease self-management	6	The proportion of controlled blood pressure was greater and there was a significant decrease in systolic blood pressure

	USA				program model		in the intervention group (P=0,04).
3.	(He et al, 2015) China / Asia	Randomized clinical trial	279 5th graders	BMJ	Intervention: creating curriculum and education on salt reduction	7	The education program was effective in reducing salt intake in children and their families with the mean salt intake in the intervention versus control group being 1.9 g/day versus 2.9 g/day after being given the education program.
4.	(Komolafe et al, 2020) Nigeria / Afrika	Randomized clinical trial	1259 adolescents	Journal of Stroke and Cerebrovascular Disease	Intervention: providing education on understanding, risk factors, symptoms, and appropriate responses for stroke patients	7	Stroke education was effective in forming awareness to prevent stroke in adolescent school children. Knowledge score in the intervention group was higher than the control group.
5.	(An et al, 2018) USA	Randomized clinical trial	160 people aged ≥65 years	Journal of Neuroscience Nursing	Intervention: educational programs and discussions on stroke knowledge and lifestyle changes	6	Primary stroke prevention is effective for improving stroke knowledge and the number of steps and reducing the amount of sodium and fat consumption.
6.	(Menkin et al, 2019) USA	Randomized clinical trial	233 adults aged ≥60 years	American Heart Association	Intervention: Education on stroke prevention and promotion of walking	6	Increase in the average number of daily steps, fluctuating in nature but there is an increase in stroke preparedness (p<0.001).
7.	(Choi et al, 2015) Hong Kong / Asia	Cohort	577 ischemic stroke patients	Hong Kong Medical Journal	Intervention: Secondary stroke prevention program	5	The stroke prevention program could significantly reduce systolic blood pressure, glycated hemoglobin levels, and LDL levels in the control group.
8.	(Kurniawati et al, 2016) Indonesia / Asia	Cross-sectional	165 stroke patients	Indonesian conference in clinical pharmacy	Identifying the level of adherence to taking medication	6	Lack of family support (7.8%) is the fourth most common reason for non-adherence to taking medication.

Discussion

Stroke is a disease that warrants special attention because of its burden and impact. Individuals with a high risk of stroke and their family members need to receive information about risk factor management strategies.19 The stream of motivation and support from experienced people, family members and health workers can facilitate the implementation of stroke prevention.16 The family is the closest environment of the individual, thus, it can play a major role in influencing health.

The Family Health Program is a program with a family and

community approach in which health workers provide comprehensive care.20 Family health programs can reduce the risk of stroke recurrence and death to a minimum of two visits a year.12 The activities carried out are monthly visits to high-risk patients by health workers, checking family members' medical history regularly and conducting workshops on chronic disease management guidelines to bolster knowledge.12 Better knowledge can improve individual awareness to reduce stroke risk by changed behavior.

Menkin et al conducted a randomized clinical trial with interventions in the form of promoting the benefits of walking and the dangers of stroke as well as monitoring walking activities and telephone reminders. The results of this study showed that the intervention group had a better daily walking score change than the control group. In addition, the frequency of calling 911 when stroke symptoms occurred was increasing in the intervention group. This suggests that there is a continuous improvement in stroke preparedness.21 Physical activity independently reduces the risk of stroke and lowers other cardiovascular risk factors.22,23 It is more likely for an individual to modify their lifestyle such as physical activity and dietary habit when encouragement from the family is present.4

The study by An et al (2018) reported that there was a decrease in sodium and total fat intake after being given education about stroke and lifestyle changes. The intervention group showed a greater increase in stroke knowledge and a decrease in sodium and total fat consumption.24 Knowledge can motivate and empower patients so that patients can determine the right way of self-control, adopt a healthy lifestyle, pharmacological choices, psychosocial adjustments due to chronic illness, and utilize resources to increase knowledge.3 Families with good knowledge can practice good health behaviors as early as possible.3 This is supported by the study of Jiang et al who reported that health behaviors were correlated with family communication. Improved communication encourages the formation of good health behavior.25

One approach to improve secondary stroke prevention behavior is to take advantage of the role of peer educators, such as families. Peer educators are public health workers or people who are trusted and respected as members of the community according to the culture and language of the target population. The study by Kronish et al (2014) reported that there was a significant change in systolic blood pressure in the intervention group after being provided intervention by peer educators.26

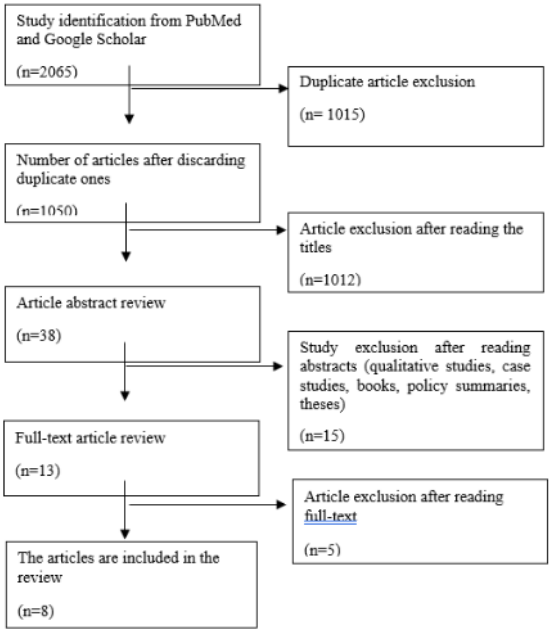

Chart 1. Article Selection Flowchart

Stroke prevention with a family approach can also be applied at the school level. Komolafe's et al study showed that subjects in the intervention group had a higher and statistically significant knowledge score where the increase in score was in line with increased knowledge and awareness about stroke.27 Providing education about salt or natrium intake and its effect on cardiovascular can reduce the level of salt consumption in children and adults.28 The reduction in salt intake was accompanied by a significant reduction in systolic blood pressure in adults. Meta-analyses reported that a 1 g/day reduction in salt intake could reduce systolic blood pressure by about 1 mmHg.9 A low-salt diet since childhood can reduce the increase in blood pressure with age, thus preventing the occurrence of high blood pressure and cardiovascular disease in later life.28-33

Conclusions

Family support is one approach to stroke prevention in order to reduce the burden of stroke. Stroke prevention by the family can be done through providing education about stroke and support and encouragement for risk factor management. The weakness of this systematic review is that there are not many observational or experimental studies to support this study. Therefore, research on stroke prevention with a family approach needs to be encouraged.

Conflicts of Interest

The author declares there is no conflict of interest.

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