Evaluation of caregiver intervention on recovery of patient stroke: a systematic review

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Abstrak

Latar belakang: *Stroke merupakan kontributor utama pada kecacatan jangka panjang. Keadaan tersebut dapat menyebabkan kelangsungan hidup stroke bergantung pada caregiver, yang mungkin seorang profesional atau anggota keluarga, sehingga tujuan dari tinjauan literatur ini untuk memberikan informasi terkait hasil dari intervensi yang diperantarai oleh caregiver pada penderita stroke.*

Metode: *Systematic Review ini disusun dengan melakukan pencarian literature dengan memasukkan kata kunci yang relevan berdasarkan database PubMed, Proquest, Ebsco, Science Direct, dan Google Scholar, dengan mengikuti panduan PRISMA.*

Hasil: *Diperoleh 6 artikel yang sesuai dengan kriteria inklusi dan didapatkan hasil bahwa intervensi yang diperantarai caregiver dapat menurunkan tingkat keparahan dan kematian, pemulihan fungsi fisik, perubahan kemampuan fungsi kognitif, kecemasan dan kualitas hidup pada penderita stroke. Selain itu dapat meningkatkan pengetahuan, keterampilan dan kepuasan caregiver.*

Kesimpulan: *Perawat dapat memberdayakan caregiver dalam merawat pasien stroke dengan tujuan terjadi peningkatan pemulihan fisik, mental serta menurunkan angka kematian.* ***(Health Science Journal of Indonesia 2020;11(1):57-69)***

Kata Kunci: *Caregiver, Intervensi keperawatan, Penderita stroke*

Abstract

Background: Stroke is a major contributor to long-term disability. This situation can lead to stroke survival depending on the caregiver, who may be a professional or family member, so the purpose of this literature review is to provide information regarding the outcome of caregiver-mediated interventions in stroke patients.

Method: The Systematic Review was compiled by searching literature by entering relevant keywords based on the PubMed, Proquest, Ebsco, Science Direct, and Google Scholar databases, following the PRISMA guidelines.

Results: Obtained 6 articles that fit the inclusion criteria and found that caregiver-mediated interventions can reduce the severity and death, recovery of physical function, changes in cognitive function abilities, anxiety and quality of life in stroke patients. Moreover, it can increase knowledge, skills and caregiver satisfaction.

Conclusion: Nurses can empower caregivers in caring for stroke patients with the aim of increasing physical, mental recovery and reducing mortality. ***(Health Science Journal of Indonesia 2020;11(1):57-69)***

Keywords: Caregiver, Nursing interventions, Stroke patients

Globally, stroke is the third leading cause of death after coronary heart disease and cancer. In 2015 it reached 11.8% of total deaths worldwide.[1] According to the World Health Organization, (2018), stroke continues to increase each year and by 2020 it is estimated that more than 60 million people, where there are almost 6,000,000 people (10%) of the world's population each year die. In 2030 the estimated death rate with a disability reaches 200 million.[3] A stroke can strike someone every 40 seconds and can kill every 3 minutes 45 seconds, and each year can kill nearly 133,000 people.[4]

Deaths from strokes are highest in developing countries, 3 which rank highest among them China with nearly 1,700,000 people, India with almost 800,000 people and Russia with more than 500,000 people.[2] Indonesia, which is also a developing country, cannot be separated from the incidence of deaths from stroke. According to the 2018 RISKESDAS data, the prevalence also continues to increase, from 7% in 2013 to 10.9% in 2018.[5]

Disability or sequelae are experienced by 75% of stroke sufferers, 15% -30% of them experience severe disability.[6] Residual symptoms suffered by post-hospitalized stroke patients cause survival depends on the caregiver, so it takes the role of caregivers both professional and their own families.[7] Current clinical practice guidelines recommend caregivers come from the immediate family of stroke sufferers so they can become active members of their rehabilitation team by participating in goal setting and decision making to facilitate functional and integrated community recovery[8], according to Friedman, Bowden, & Jones, (2010) family is the main health care provider for sufferers who experience chronic pain.

However, families need information, education and social support to be able to carry out care when patients go home[10], therefore the role of nurses as educators can provide interventions providing special skills and information related to caregivers to reduce their burden and empower families in the care of stroke patients.[11] Young & Lutz, (2010) revealed, stroke patients have better recovery results if they have a strong social support system and good family functions to help their recovery needs.[12] Good knowledge and skills will improve the quality of care provided by caregivers.[13] Several previous studies have involved caregivers by increasing skills and knowledge about post-stroke care. However, the results presented are different, so the review of this literature aims to provide information related to the results of interventions conducted by caregivers that are useful in improving the condition of stroke patients, especially when returning home.

METHODS

In preparing this systematic review based on PRISMA and Cohrane guidelines.[14] Collection of relevant articles in the Pubmed, Proquest, Ebsco, Science Direct and Google Scholar databases. The PICOS keywords used are: P (caregiver OR family caregiver OR family), I (stroke patients), C (-) O (stroke recovery OR function recovery), S (RCT AND Quasi Experiment), and article filtering strategy explained in the flow chart (Diagram 1). To be more specific, the author also determines several inclusion criteria, namely: (1) publication in the last 5 years from 2014 to 2019, (2) full text, (3) original article, (4) discusses caregiver intervention in stroke patients, and (5)) the article uses English. And exclusion criteria such as: (1) articles do not involve caregivers, (2) Qualitative, review, pilot studies, only abstracts, individual reports, and newsletters, and (3) articles published before 2014.

Ethical Clearance

The authors declare there is no any ethical issues that may arise after the publication of this manuscript.

RESULTS

The results of a search on 5 databases obtained 2,057 articles and found a double publication of 993 articles. So that there are 1,064 articles left. The article was then scanned according to inclusion and exclusion criteria totaling 1,056 articles so that the remaining 8 articles, but 2 of them were excluded because they did not fit the topic which eventually obtained six research articles that met the requirements. The research was conducted in several countries such as Thailand, Taiwan, South Korea, Indonesia and China. The methods used in these studies are the Randomized Controlled Trial (n = 3) and the Quasy Experimental Design (n = 3). Research articles in the years 2015-2019.

Evaluation of interventions conducted by Caregiver;

1. **Decreased severity of stroke and death**
   It was found three articles related to additional rehabilitation therapy given by caregiver had

more significant results in decreasing the severity of stroke, common complications that usually occur in stroke sufferers (aspiration pneumonia, urinary tract infections, pressure sores, joint contractures and recurrent strokes) reduced and mortality rates in the group given caregiver intervention reported lower mortality than the control group who only received conventional rehabilitation therapy.[15]

2. **Improved clinical conditions in stroke patients**
   From the six articles reviewed, there were several results of improvement in clinical conditions in each article. Four articles get the same results, namely an increase in the Barthel Index score or an increase in Activity Daily Living (ADL) ((15–18). Two articles have resulted in an increase in the Berg Balance score (15,16). One article found the results of increased muscle strength, mobility, physical composite, free running speed and 6 minute walking distance.[16]
3. **Changes in cognitive abilities in stroke patients**
   From the entire literature reviewed, two articles revealed the results of cognitive changes in stroke patients in the experimental group compared to the control group, measured using the Mini mental status examination (MMSE) instrument.[15,19]
4. **Anxiety in stroke patients**
   One of the six articles reviewed that found the results of decreased anxiety and depression in stroke patients managed by caregivers were measured using the *Hospital Anxiety and Depression Scale* (HADS).[19]
5. **Quality of life of stroke sufferers**
   One of the articles reviewed had significant results on improving the quality of life of stroke patients handled by caregivers compared to those not, measured using a 12-item-scale Stroke-specific quality of life (SSQoL) instrument to measure the quality of life for post-sufferers stroke.[18]
6. **Caregiver burden and satisfaction**
   Of the six articles reviewed, there was one that assessed the workload and satisfaction of caregivers while caring for stroke patients, measured using the Canadian Occupational Performance Measure (COPM) instrument to assess caregiver satisfaction and family burden scale and caregiver burnout scale to assess caregiver burden.[19]

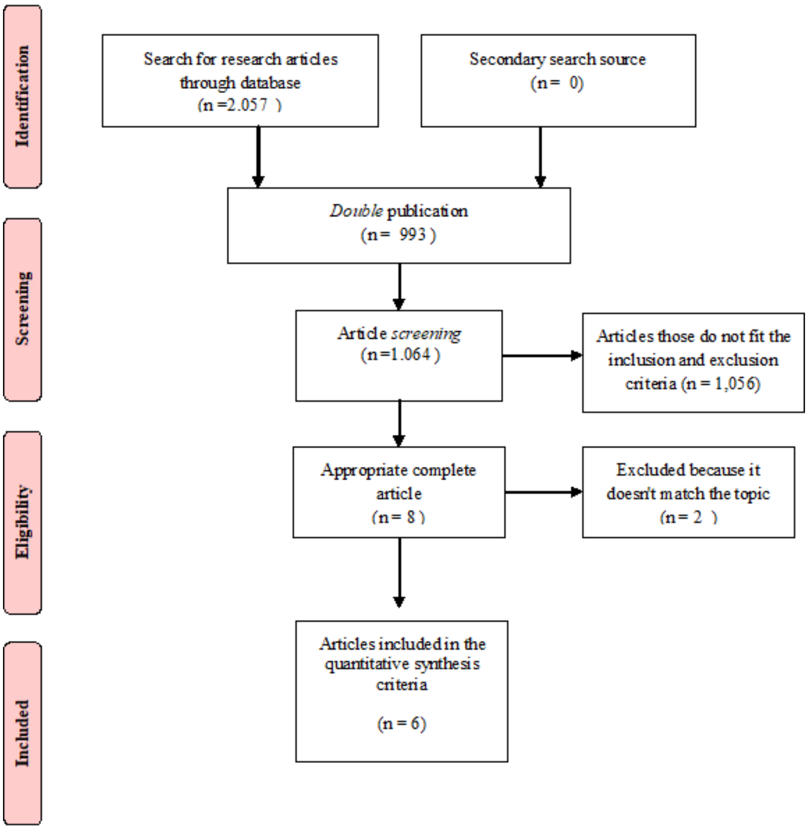

Figure 1. Flow diagram

No	Title / Author, Year	Design	Aim	Intervention	Responden	Instrument and *Follow-up*	Result	Conclusion
1.	*Caregiver*-Mediated Intervention Can Improve Physical Functional Recovery of Patients With Chronic Stroke : A Randomized Controlled Trial / (20), Taiwan	RCT	find out whether home-based interventions that are mediated by families can improve physical function and social participation in stroke sufferers	Provision of exercise for 12 weeks, according to the home-based intervention program which is divided into 3 phases: 1. Phase 1 (weeks 1-4) to improve the function of the patient's body and structural components 2. Phase 2 (weeks 5-8) to improve the ability of sufferers to carry out daily activities in their neighborhood. 3. Phase 3 (weeks 9-12) to help sufferers return to the community and participate in activities in their environment.	51 stroke patients and their caregivers (intervention 25 people and control 26 people)	1. Evaluate physical recovery in stroke sufferers using the stroke impact scale, the Berg Balance scale, the 10 meter walking test, the 6 minute walk test and the barhtel index. 2. Evaluate the caregiver using the caregiver load scale	Home-based interventions significantly increase the Stroke Impact Scale score: strength (control vs. intervention, respectively: 1.4 vs 15.5; P = 0.002), mobility (-0.5 vs 13.7; P <0.001), physical composites (-0.7 vs. 11.2; P <0.001), and the general recovery domain (0.2 vs 17.4; P <0.001). CHI also significantly increased the speed of free walking (-1.4 vs. 7.5 cm / s; P = 0.006), 6 minutes walking distance (-10.5 vs 15.8 m; P = 0.003), Berg Balance Scale score (-0.8 vs 4.5; P = 0.006), and the Barthel Index score (0.6 vs 7.2; P = 0.008) But the CHI program did not significantly influence the increase in caregiver burden	Home-based interventions can improve physical functional recovery and, perhaps, social participation in sufferers with chronic stroke
2	A Community Based Program for Family *Caregivers* for Post Stroke Survivors in Thailand / (17), Thailand	*Quasi Ekperimental*	Evaluating post-stroke care programs in community settings in Thailand	Interventions given to families for 4 weeks by providing information and practice skills related to post-stroke care, which are then evaluated 2 months after the intervention related to family skills and daily activities of patients (ADL) and complications. The interventions provided are: 1. Week 1: provide post-stroke care information and practice skills for 5 days (1 session per day) a. Day 1: basic knowledge of	62 pairs of stroke sufferers and families (31 pairs per group)	1. Evaluation of post-stroke care skills compiled solely by researchers adapted from the fundamental nursing skills checklist of the Thai Red Cross College of Nursing. Which has been validated. 2. Evaluation of physical functional	After participating in this program, family caregivers in the experimental group significantly improved their post-stroke care knowledge and skills compared to those in the control group (F = 585.81, p <0.001). ADL among post-stroke sufferers in the experimental group increased significantly over time and was higher than in the control group (F = 46.01, p <0.001). In addition, complications among sufferers in the experimental group	This research provides evidence of the importance of family caregivers who have important skills for caring for post-stroke sufferers at home. The results showed that family caregivers who participated in post-stroke care intervention programs had improved post-stroke care skills, resulted in increased ability to perform ADL

				pathology, consequences, severity, golden period, stroke recovery, support for sufferers to carry out routine daily care, complications b. Day 2: pressure sores, wound care, UTI c. Day 3: nutrition, treatment d. Day 4: mobilization, rehabilitation e. Day 5: how to manage emotions and stress, social support. 2. Weeks 2 & 3: focus on reviewing topics discussed in week 1 including family skills. The activity is carried out every week and lasts 2 hours 3. Week 4: home visits as a follow-up from researchers to evaluate post-test interventions, and identify mobility needs for the care of sufferers such as canes, walkers or wheelchairs. 4. Week 8: home visit. Researchers evaluate the care of sufferers, encourage and advise them related to their problems and obstacles. Assessing the needs of patients and families which are then coordinated with the CHC Families of stroke patients in the control group only received routine care from CHC	ability / ADL using MBI (The Modified Badthel Index) developed by Shah et al. 3. Evaluation of complications in patients is measured using a dichotomous scale based on literature review by assessing 5 common complications of patients (aspiration pneumonia, UTI, pressure ulcers, joint contractures, and recurrent strokes) that have been tested for validity and reliability.	were less than in the control group	and reduced complications in post-stroke patients. For further studies, researchers must consider research methodologies for people with disabilities and must monitor the program's long-term effectiveness to confirm the maximum concrete benefits for sufferers.
3	Effect of a	*Quasi*	Evaluate the	All sufferers in the control and	Evaluate the severity	No differences between groups	Caregiver education

Caregiver’s Education Program on Stroke Rehabilitation /(15), Korea Selatan	*eksperiment*	effects of educational programs and stroke caregiver satisfaction and functional recovery of sufferers in addition to conventional rehabilitation care	experimental group received two daily conventional rehabilitation therapy sessions (5 days / week for 4 weeks). One session consists of physical therapy and occupational therapy, and occasional speech therapy for half an hour, all in one and a half hours. Patients in the experimental group received additional rehabilitation therapy based on an educational program, which included family members or formal caregivers, which were organized by physiotherapists and carried out by physiotherapists and occupational therapists when transferred to the 2 Departments of Physical and Medical Rehabilitation. Additional rehabilitation therapy given to caregivers is carried out for 10-20 minutes after dinner on weekdays and after breakfast and also dinner on weekends, and is carried out for 4 weeks after completing the education program	A total of 181 respondents. Patients who received additional rehabilitation therapy were assigned to the experimental group (n = 81), the control group (n = 100) who only received conventional treatment.	of stroke sufferers using: 1. K-NIHSS, the Korean version of the National Institutes Of Health Stroke Scale 2. Korean version of mini mental status examination (K-MMSE) 3. Modified Barthel Index (K-MBI) 4. The Berg Balance Scale (K-BBS). Evaluation is carried out within 3 days of transfer to the Department of physical rehabilitation, and 3 days after the patient returns. Caregiver satisfaction using measurements: Canadian Occupational Performance Measure (COPM) Caregiver expenses using: 1. Family burden scale 2. Caregiver burnout scale Evaluation is carried	were observed between the initial K-NIHSS, K-MMSE, K-BBS, K-MBI scores, and time from entry to transfer. Patients with moderate or severe stroke in experimental conditions showed more significant improvement than the control group as determined by K-NIHSS and K-BBS, and the tendency for K-MMSE and K-MBI scores to increase. Significantly greater satisfaction for family members and formal caregivers of patients with stroke while moderate severity in the experimental group.	programs for stroke subjects have positive results on functional improvement of patients and caregiver satisfaction. The authors believe that additional rehabilitation therapy with educational programs helps sufferers achieve functional improvement for the return of optimal social life.

						out before and after it is given Education		
4	Increase in the functional capacity and quality of life among strokepatients by family *caregiver* empowerment program based onadaptation model / (18), Indonesia	*Quasi-experimental research with a pre and post test control group design*	Identify the effect of family empowerment programs based on the adaptation model (CEP-BAM) on the functional capacity and quality of life of patients after a stroke	In the intervention group the CEP-BAM program was divided into 3 phases: 1. Pre-education phase Psychological approach to fostering a trusting relationship between sufferers and their families. 2. Intervention Performed 6 interventions during the meeting with family and sufferers: a. Family caregiver education about stroke, prevention of recurrent stroke and stroke problems (first meeting with family caregiver in the first week). b. Family education and training about adaptive coping strategies after stroke. Efforts to achieve physical recovery include regular physical examinations, treatments, physical exercise and dietary stroke (second meeting with family caregiver in the first week). c. Family training in adaptation exercises after stroke includes part 1 body movements, including ambulation in bed, sitting in bed, standing and moving from bed to wheelchair and vice versa	80 samples (40 participants in the intervention group and 40 participants in the control group)	1. Bartel's Index to measure functional capacity after a stroke 2. Stroke-specific quality of life (SSQoL) 12 item-scale (short version) to measure quality of life after stroke Measurements were taken 4 times before the intervention (pre-test), in the last week of the fourth month (post-test 1), the fifth month (post-test 2) and the sixth month after the intervention (post-test 3)	This study proved a significant difference in functional capacity and quality of life between the two groups and between the pre-test and six months after the intervention ($P < 0.05$). The quality of life of the intervention group at the sixth month after the intervention was better than the control group (33.40 ± 3.65 vs. 30.60 ± 2.78) with a significant difference ($P < 0.05$).	CEP-BAM effectively increases the functional capacity and quality of life of patients after a stroke in the sixth month after the intervention. Nine out of ten domains of functional capacity increased in the intervention group after CEP-BAM, while two domains (eating and dressing) increased significantly in the 6 months after CEP-BAM. This intervention model can be used as a standard procedure in the management of post-stroke patients in community settings, especially for patients with mild to moderate disability after a stroke.

(third meeting with family caregiver in the first week).

- d. Family training on adaptation exercises after stroke includes body movements part 2, such as walking exercises and joint movements (fourth meeting with family caregiver in the second week).
- e. Family training on adaptation exercises after stroke, such as doing basic daily activities and roles, including bathing, using toileting, dressing and feeding exercises (fifth meeting with family caregiver in the second week).
- f. Family education about strategies to support sufferers and maintain an adequate psychological state of self when caring for sufferers (the sixth meeting with family caregivers in the third week).

3. Monitoring / evaluation
    - a. Encourage families to guide sufferers to do adaptation exercises regularly.
    - b. Monitor notes made by the family: type and time of exercise, and the ability of sufferers to adapt.
    - c. Support the family when they have difficulty in caring for sufferers

				The control group received a standard intervention in the form of a public health care program (CHN) integrated with a health program at the Community Health Center. The programs provided are: a. Early detection of recurrent stroke b. Health counseling c. Basic health care d. Referral to the nearest health service if the patient has a health problem				
5	Effect of family education program on cognitive impairment,anxiety, and depression in persons who have had a stroke: A randomized, controlled study/ (19), Tiongkok	*Randomized, control study*	Evaluate the effects of family member education programs (FMEP) / family member education programs on cognitive disorders, anxiety, and depression in people who have had a stroke	The caregiver intervention group was given an FMEP intervention and the patient received conventional care. FMEP consists of: 1. The first 2 weeks of caregivers receive 5 education sessions on understanding of stroke, the effects of stroke, general problems, physical care, and mental health care. 2. The next 3-8 weeks, caregivers are invited to attend weekly workshops that provide counseling, communication, and assistance to resolve any problems they face. Meanwhile, post-stroke care specialist nurses, rehabilitation specialists, or social workers make visits as needed and to provide further support 3. 3-12 months post stroke, a monthly call is made to the caregiver to get a stroke patient and	144 sufferers (77 interventions, 77 controls)	1. Demographic and clinical data of patients and families using a questionnaire that has been provided consists of: age, sex, duration of education, location of lesions, smoking status, hypertension, hyperlidepimia, and diabetes, gender caregiver and caregiver education 2. Cognitive assessment of patients using the Montreal Cognitive Assessment (MOCA) score.	An increase in the Montreal Cognitive Assessment (MOCA) score from baseline to 12 months (M12 - baseline) in the FMEP group was higher than in the control group, and FMEP caused a decrease in the level of cognitive decline (MOCA score ≤26) after 12 months compared to the control group. Changes in Hospital Anxiety and Depression Anxiety and depression score (M12 - baseline) scale decreased in the FMEP group compared to the control group. Fewer participants with depression and lower levels of depression were observed in the FMEP group compared to the control group	FMEP can reduce cognitive impairment, anxiety, and depression in people who have had a stroke

				if there are concerns related to treatment. During this period nurses, rehabilitation specialists, and social workers make visits to sufferers or caregivers if necessary and caregivers are still permitted to join the weekly workshop without any limitations while still in the study program, mental health care. In the control group, sufferers only received conventional treatment.		3. Assessment of mental status of patients using the Minimum Mental State Examination (MMSE) score. 4. Assessment of anxiety and depression using the Chinese version of the Hospital Anxiety and Depression Scale (HADS)		
6	The effect of *caregiver* education program on functional independence and Mortality in first-ever stroke (21)	*A single-blinded randomized controlled trial*	Evaluate the effect of the caregiver education program (CEP) / caregiver education program as a stroke rehabilitation modality using historical data that is still correlated with current practice in the stroke unit.	The CEP intervention program is conducted in the form of interactive discussions guided by neurologists using projector overhead and posters. The contents of the CEP were adapted and modified from the caregiver support program at Mount Sinai Medical Center, Cleveland, Ohio, which aims to prepare caregivers in adapting to the disabilities of stroke patients and reducing anxiety and to involve caregivers in the rehabilitation process. The discussion starts in the second week of entry, and consists of 4 sessions, namely: Session 1: information about the type of stroke and its risk factors. Session 2: information about the types of disabilities that may occur after a stroke Session 3: education about the role of caregivers in overcoming post-stroke morbidity and outpatient preparation Session 4: education about caregiver efforts in secondary or tertiary prevention related to diet, lifestyle, and emotional problems.	172 subjects who had a first stroke and did not have other comorbidities or invasive treatment at the time of recruitment were divided into groups that received CEP (n = 88) as an experimental group, and a control group (n = 84)	1. An independent functional assessment uses the Barthel activity daily living (ADL) index. 2. Mortality report	No statistical differences were found at the baseline of the two groups. CEP significantly increases functional independence (RR = 1.30, 95% CI 1.03-1.63) of stroke patients. Although the effect was not significant on three-month survival, the group that received CEP had a lower mortality rate	Caregiver education programs have positive results on functional independence of sufferers, especially in the elderly, attainment of low formal education and caregiver socioeconomic status, lighter presentation of stroke and caregiver to the nuclear family.

DISCUSSIONS

The results of the sixth literature review found that before providing intervention to stroke patients, caregivers were first given health education and training on post-stroke care.[15–19,21] Knowledge is closely related to the behavior that will be taken in conducting post-stroke care because with that knowledge the caregiver will have a reason or a strong foundation in taking an action. The American Heart Association (AHA) states that the most effective education program must include problem solving that supports skills development as well as how to meet physical care needs.[2]

1. **Decreased severity of stroke and death**
   Of the six articles reviewed, three of them found a decrease in severity and mortality in stroke patients managed by caregivers.[15,17,21] There are several instruments used to measure the severity of stroke patients such as the Korean version of the National Institutes of Health Stroke Scale (K-NIHSS), and the Thai version of the Fundamental Nursing Skills Checklist of the Thai Red Cross College of Nursing Study (Hong et al., 2017; Pitthayapong et al., 2017). Other related findings about the lack of knowledge possessed by caregivers will have an impact on the occurrence of recurrent strokes, patients can not perform activities independently and even death can occur.[23] This proves that the role of the caregiver in caring for family members who suffer from stroke is very important, especially in terms of decreasing the severity and prevention of recurrent attacks, the caregiver can be a controller or reminder to stroke patients to comply with any therapy or treatment given.

2. **Improved clinical conditions in stroke patients**
   Of the six articles reviewed there were four articles that used instruments in the form of Barthel Index scores or an increase in Activity Daily Living (ADL)[15–18] to assess the improvement of clinical conditions that occur in stroke patients, and two other articles using the Berg Balance scoring instrument.[15,16] In addition, the other clinicians' outputs measured from one of the articles reviewed were increased muscle strength, mobility, physical composite, free-running speed and 6-minute walking distance.(16) It can be concluded that the instrument most widely used in measuring clinical output in stroke patients who receive support and care from the caregiver is the Barthel Index on the fulfillment of ADL and is supported by other Berg Balance instruments. The results of a meta-analysis suggest that the Barthel Index Scale is a good instrument used in assessing the ability of stroke patients.[24]

3. **Changes in cognitive abilities in stroke patients**
   From all the articles reviewed, there are two articles that report on the results of cognitive changes in stroke sufferers. The instrument used in measuring cognitive change is the Minimum Mental State Examination (MMSE) score.[15,19] Other instruments use the Montreal Cognitive Assessment (MOCA) score.[19] Stroke sufferers are very susceptible to changes in cognitive function, therefore a measurement of cognitive function is very important to do at the beginning of the examination so that interventions involving caregivers or family empowerment can continue between the intervention plan and the expected clinical output. At least stroke sufferers are still able to understand every instruction or direction from the caregiver when doing care interventions or recovery.

4. **Anxiety in stroke patients**
   One of the six articles reviewed measured other clinical outputs namely anxiety, as for the instruments used in measuring the level of anxiety and depression in stroke sufferers using the Chinese version of the Hospital Anxiety and Depression Scale (HADS).[19] The findings say that involving caregivers in care can reduce anxiety levels and depression in the incidence of stroke compared to those who do not involve caregivers in the care of stroke sufferers (Huang et al., 2017; & Yu et al., 2019). From the results of the review found that other clinical outputs such as anxiety and depression are very important to note, stroke is one of the conditions of the disease that the recovery process requires a lot of time, even most stroke sufferers can not recover 100% as before illness that can be compounded with age which is getting older. Sometimes stroke sufferers who have high anxiety and depression find it difficult to be more cooperative when an intervention is carried out.

5. **Quality of life of stroke sufferers**
   One of the six articles reviewed, measures the quality of life of stroke sufferers, while the

instrument used to measure the quality of life of stroke sufferers uses the Stroke-specific quality of life (SSQoL) 12 item-scale (short version).[18] Quality of life in patients with chronic diseases such as stroke tends to decrease so that by empowering caregivers (families) in each treatment intervention can help stroke patients to be more motivated to improve their health status.[11] The support obtained from the caregiver will be very helpful in achieving the expected short-term and long-term goals.

6. **Caregiver burden and satisfaction**

   Of the six articles reviewed there is one article that measures these two factors, where the instruments used to measure caregiver burden are the Family burden scale and Caregiver burnout scale and caregiver satisfaction measurements using Canadian occupational performance measures (COPM).[15,19] In addition, other outputs that are very important to consider and even apply to all interventions that involve the role of a caregiver or family empowerment are the caregiver's burden and satisfaction while caring for stroke sufferers.[11,25] Avoiding burnout or burnout in caregivers, it is recommended to assess it, because the success of an intervention that involves caregivers greatly affects the mood or the feeling of burnout felt during caring for stroke sufferers, not a few caregivers complain about patience in caring for stroke sufferers. In addition, assessing the satisfaction of caregivers is also important, with the aim that caregivers who are satisfied with the interventions implemented will have a good impact on the success of the recovery process and of course with stroke patients who are more active and cooperative.

In conclusion, the results of a review of six articles, we can see that caregivers can be involved in treating stroke patients to improve physical, mental recovery and reduce mortality. However, to achieve these goals, nurses must first prepare a caregiver, by increasing the caregiver's knowledge and skills in post-stroke care.

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