

# An Integrative Review of Discharge Planning Interventions with Thai Stroke Patients

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## ABSTRACT

As the second leading cause of death and a major cause of permanent disability throughout the world, stroke is a global public health problem. The number of strokes has increased steadily, and they are more prevalent in adults and older adults. Therefore, it is important to identify discharge planning interventions that can reduce stroke survivors' readmissions, complications, and mortality. To examine the effect of discharge planning interventions on Thai stroke patients, an integrative review is conducted here. The review includes articles published between 2004 and 2020 taken from PubMed, Scopus, Ovid (PsycINFO), CINAHL, and ThaiO. It proceeds by applying the PRISMA guidelines. Thirteen intervention studies were included in this review, which synthesizes evidence to inform healthcare providers and researchers about the effects of discharge planning interventions on stroke survivors. Our findings indicated the importance of discharge planning interventions for effectively preventing stroke survivors' rehospitalization and reducing their complications and mortality. The interventions also increased stroke survivors' quality of life, knowledge, and readiness, and improved the satisfaction of stroke survivors, caregivers, and healthcare providers. However, in Thailand, there is still not enough evidence regarding the effectiveness of discharge planning interventions for stroke survivors. Overall, the current review suggests that healthcare teams and researchers should implement such interventions for stroke survivors.

**Keywords:** Stroke, discharge planning, intervention, multidisciplinary team, transition care, integrative review

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## INTRODUCTION

Stroke is currently the second leading cause of death around the world. On average, someone in the US has a stroke every 40 seconds, and every 3 minutes and 35 seconds, someone dies of stroke.<sup>1,2</sup> In Thailand, stroke is the number one cause of death and is likely to continue to increase at an average of 30,000 cases per year.<sup>3,4</sup>

In our time, there have been advances in science and technology that have allowed more patients to be treated and helped them survive. However, surviving stroke patients have also had increased fragility, complications, and residual disabilities.<sup>3,5</sup> The most common complications include pressure sores, respiratory infection (e.g., pneumonia), and urinary tract infection (UTI), which increase the lengths of hospital visits and the costs of medical treatment.<sup>6,7</sup> These complications pose problems for stroke survivors in terms of physical health, mental health, and socioeconomic wellbeing while putting burdens on the resources of the healthcare system.<sup>8</sup>

Patients with strokes have had many complications upon being discharged from the hospital.<sup>9,10</sup> At least one complication was found in 71% of stroke survivors. These complications include shoulder subluxation (37.3%) (mild to moderate degree), limb spasticity (41.6%) (severity grade of less than 3 on the Modified Ashworth Scale), musculoskeletal pain (32.4%), bowel or bladder dysfunction (31.5%), infection (16.5%), depression (13.8%), and anxiety (5.8%).<sup>11</sup> These examples indicate the problems of stroke patients during the transition from the hospital to the community or their homes.<sup>12,13</sup>

Discharge planning is an ongoing assessment of health care needs after discharge from the hospital that engages families and patients in formulating a post-discharge action plan. Discharge planning identifies the potential benefits of giving patients and their families support in formulating an appropriate self-care teaching plan for

each patient.<sup>14</sup> Efficient discharge planning can help reduce hospital stays, hospitalization costs, and hospitalizations.<sup>15,16</sup>

Discharge planning for stroke patients has been studied in a number of ways in conjunction with the development of knowledge and models of care in several professions. However, in previous studies on discharge planning for stroke patients in Thailand, it was found that there was a lack of concrete guidelines and model planning, a lack of systems and mechanisms for discharge planning, and a lack of participation of patients and relatives. The planned distribution cannot be applied in real-world situations.<sup>17,18</sup> Therefore, in order to achieve the ultimate goal of an effective patient care system, links must be formed between the knowledge and practices of multidisciplinary teams and the provisions of evidence-based health services. We are interested in developing discharge planning for stroke patients through a systematic review of relevant academic literature. The aim is to acquire knowledge that can lead to better nursing practices and guide decision-making in the choice of care patterns and methods. These should be suitable to the individual needs of each patient, improving comfort, covering all dimensions of the illness, benefitting nursing practices, and reducing distress for suffering patients and their families alike.

## PURPOSE

This integrative review aims to examine the effects of discharge planning interventions on Thai stroke patients. It also aims to identify research gaps in the interventions and recommend avenues for future research.

## METHODS

This study is an integrative review. We used the guidelines of Whittemore and Knaf<sup>19</sup> (e.g., data reduction, data display, data comparison, conclusion-drawing, and

verification) to apply rigor to the methods used to summarize previous studies in the literature review. We also followed the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA)<sup>20</sup> report, which consists of a 27-item checklist and a four-phase flow diagram.

A comprehensive search of the literature was conducted using multiple search strategies. Distinct inclusion criteria were used to ensure that only relevant studies were reviewed. Original research studies were eligible for inclusion in this review if they met the following inclusion criteria: (1) implemented discharge planning interventions to improve the quality of care of stroke patients; (2) examined the effects of home follow-up interventions on patients with stroke; (3) both control and intervention groups received discharge planning and home follow-up as part of routine or usual care practices; (4) included adults and older adults diagnosed with stroke; (5) wrote their papers in English or Thai; (6) used experimental research studies (e.g., randomized control trials (RCTs) with quasi-experimental designs). Unpublished studies, conference proceedings, published abstracts, review articles, letters to editors, book chapters, and published studies that had not undergone a peer-review process were excluded from this review.

We performed a search of five electronic databases: PubMed, Scopus, Ovid (PsycINFO), the Embase Cumulative Index to Nursing and Allied Health Literature (CINAHL), and

Thai Journals Online (ThaiJO). We used specific search terms: (1) stroke OR stroke patients OR stroke survivors AND (2) discharge OR discharge planning OR hospital discharge AND (3) intervention OR outcomes OR randomized controlled trial. There was no limit on publication dates due to the limited number of overall studies.

The selected studies were reviewed by two authors (W.S. and V.P.) to ensure that they met the criteria. The critical appraisal was performed by constructing a table describing the characteristics of the included studies, such as their purpose, population, location, research design, sample size, interventions, outcomes measured, major findings, and limitations. The current review introduces the data collection and the significant components needed to track the article review process, develop the metrics table summarizing the data, categorize the main characteristics of the discharge planning interventions, and customize the data reduction.<sup>19</sup> The primary outcome of this review was the effectiveness of discharge planning interventions.

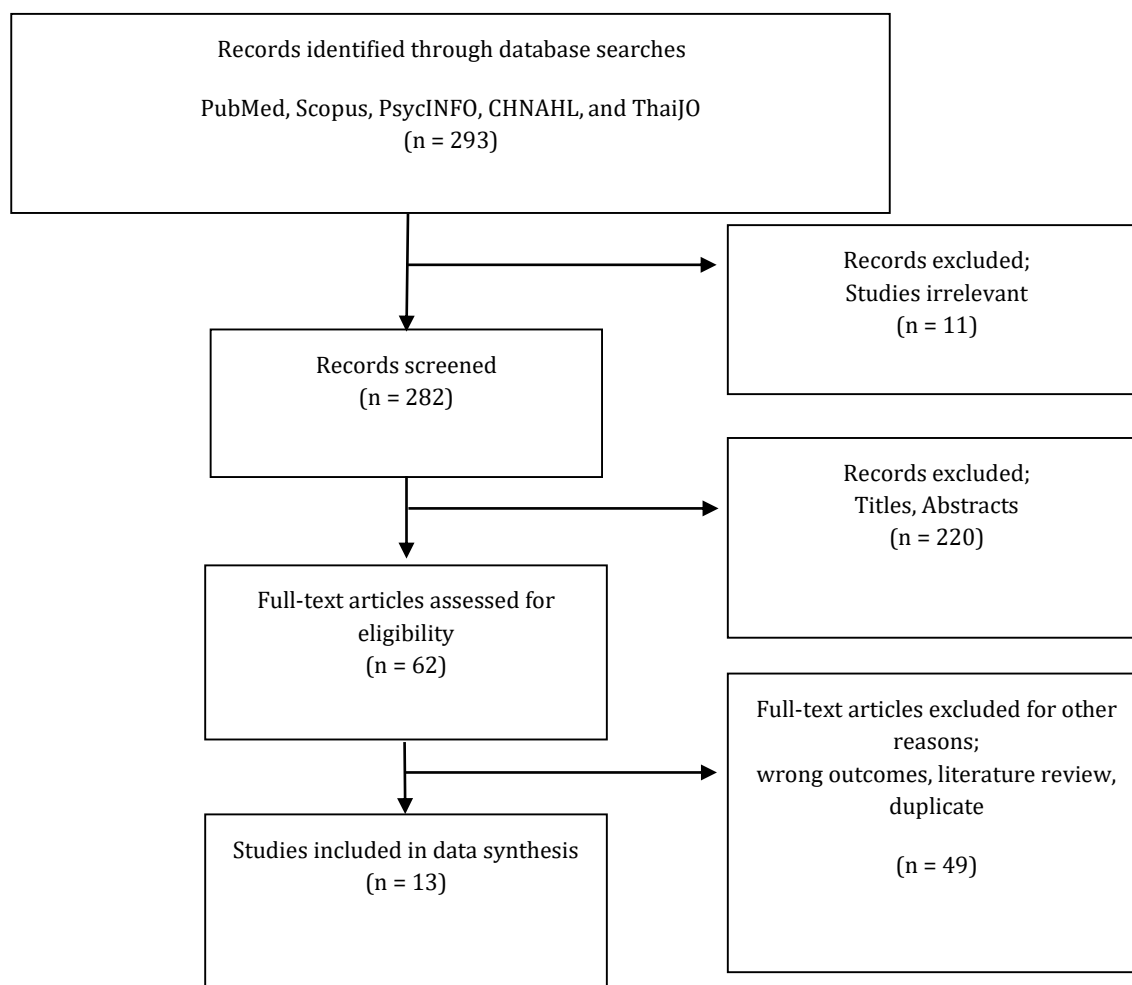


Figure 1. PRISMA flow chart for literature selection.<sup>20</sup>

## RESULTS

### Characteristics of the Included Studies

In general, the results indicated that discharge planning interventions for quality of care in Thai stroke patients

have been developed and conducted only recently, and most are still testing usability in small numbers of stroke patients. However, a total of 293 articles were analyzed based on a search of five databases. 288 articles remained

after duplicates were removed (Figure 1). Of these, 62 studies remained after an initial screening of titles and abstracts. We also excluded 49 full articles for other reasons (e.g., abstract screening, incorrect outcomes, and no literature reviews, or if they were not intervention studies, not focused on discharge planning, or published in languages other than English and Thai). The included articles were published between 2008 and 2020. This review ultimately included thirteen articles that met the criteria: eleven quasi-experimental research studies,<sup>14,17,21-29</sup> one developmental study,<sup>30</sup> and one experimental developmental research study.<sup>31</sup> All research was conducted in Thailand. The participants were stroke patients who were either still in the hospital or had been discharged to go home and multidisciplinary

teams (e.g., nurses, physicians, occupational therapists, physiatrists, nutritionists, pharmacists, social workers, and public health officials). Sample sizes among the twelve articles ranged from 3 to 364 with a total sample size of 883 participants.

**Characteristics of Stroke Survivors**

The average age of stroke survivors, as reported in 11 studies, was more than 60 years old. Most (72.72%) of the participants were female. About 100% of studies reported that of stroke survivors had married. Five studies reported that stroke survivors had a primary school education or higher.<sup>17,25-27,29</sup> Additionally, two of the reviewed studies noted that the stroke survivors were Buddhist.<sup>14,17</sup> The final two stroke survivors had comorbidity.<sup>17,23</sup>

**Table 1.** Descriptive Summary of Discharge Planning Studies for Patients with Stroke

Author (Year) Setting	Study design	Characteristics of patients	Outcomes	
			Clinical outcomes	Patient-related outcomes
Arunsuriyasak et al, <sup>31</sup> (2019) Central Thailand	Experimental development research	N: Con. = 9 N: Int. = 7	<ul style="list-style-type: none"> <li>The average work quantity per workforce increased (<math>p &lt; .05</math>)</li> <li>Cost of care decreased (<math>p &lt; .05</math>)</li> </ul>	<ul style="list-style-type: none"> <li>The service providers' satisfaction increased (<math>p &lt; .001</math>)</li> <li>The patients' satisfaction increased (<math>p &lt; .001</math>)</li> </ul>
Buapin et al, <sup>17</sup> (2019) Northern Thailand	Quasi-experimental research	N: Con. = 15; male: 73.3% N: Int. = 15; male: 60.0% Age: 60-70 years > 60% Married: > 60% Education: Primary school = 100% Buddhist: > 86.7% Comorbidity > 73.3%	N/A	<ul style="list-style-type: none"> <li>QOL in the experimental group was significantly higher than before receiving intervention (<math>t_{14} = 14.50</math> vs. <math>t_{28} = 3.63</math>, <math>p &lt; .001</math>)</li> </ul>
Budratana <sup>21</sup> (2020) Northeast Thailand	Quasi-experimental research	N: Con. = 54; male: 55.6% N: Int. = 54; male: 59.3% Age > 60 years: 47.5%	<ul style="list-style-type: none"> <li>Readmission rate of both groups showed no significant difference (<math>p = 0.810</math>).</li> </ul>	<ul style="list-style-type: none"> <li>The readiness of the experimental group was significantly higher than that of the control group (<math>p &lt; .001</math>)</li> </ul>
Bumrungpun, et al, <sup>22</sup> (2010) Eastern Thailand	Quasi-experimental research	N = 20; male: 60.0% Age: 70-79 years > 35.0% Married: 60.0%	N/A	<ul style="list-style-type: none"> <li>QOL in the experimental group was significantly higher than before receiving the program (<math>p &lt; .05</math>)</li> </ul>
Grisnapant <sup>23</sup> (2008) North Thailand	Quasi-experimental research	N = 62 Male: 48.4% Age > 67 years Comorbidity > 67.7%	<ul style="list-style-type: none"> <li>Pneumonia and bed sore rate (33.3/1,000 to 0/1,000)</li> <li>Death rate (33.3/1,000 to 16.1/1,000)</li> <li>Length of stay was shortened (4.9 to 4.2 days)</li> <li>Cost of care reduced (292 to 253.73 US dollar)</li> <li>Readmission rate within 28 days decreased (84.5 times to 0)</li> </ul>	<ul style="list-style-type: none"> <li>Patients were satisfied with healthcare services at 86.7%</li> <li>Caregivers were satisfied with nurse case managers' services at 85.5%</li> </ul>
Hattachot <sup>24</sup> (2017) Northeast Thailand	Quasi-experimental research	N: Con. = 30 Male: 63.3% N: Int. = 30 Male: 53.3% Age: > 63 years Married: > 60%	N/A	<ul style="list-style-type: none"> <li>Knowledge of daily activities in the experimental group was significantly higher than in the control group (<math>p &lt; 0.001</math>)</li> <li>Knowledge of daily activities in the experimental group was significantly higher than before receiving the intervention (<math>p &lt; 0.01</math>)</li> </ul>
Jakping <sup>25</sup> (2009) North Thailand	Quasi-experimental research	N = 20; male: 40.0% Age: 60 years (60.0%) Education level: primary school > 60.0%	<ul style="list-style-type: none"> <li>The lengths of hospital stays for stroke patients after receiving the discharge planning program were significantly lower (6.20 days) than before the program (<math>p = .05</math>)</li> </ul>	<ul style="list-style-type: none"> <li>The overall self-care ability of stroke patients after receiving the discharge planning program was significantly higher than before receiving the program (<math>p = .05</math>)</li> </ul>

Author (Year) Setting	Study design	Characteristics of patients	Outcomes	
			Clinical outcomes	Patient-related outcomes
Juntawises et al, <sup>14</sup> (2004) Southern Thailand	Quasi-experimental research	N: Con. = 100 Male: 66.0% N: Int. = 264 Male: 56.8% Married > 76.1% Buddhist: 92%	<ul style="list-style-type: none"> <li>• The mean hospital stay length was significantly lower (26.16%)</li> <li>• The mean expense of hospital stays was significantly lower (32.32%)</li> <li>• The time from initial hospital discharge to readmittance was significantly lower (15.0%)</li> </ul>	The incidence of complications was significantly lower (22.6%): <ul style="list-style-type: none"> <li>• UTI (9.5%)</li> <li>• Pneumonia (6.4%)</li> <li>• Pressure sore (4.5%)</li> </ul>
Kongkiatpun <sup>30</sup> (2013) Northeast Thailand	Developmental study	N = 3 Age > 60 years	<ul style="list-style-type: none"> <li>• Reduced the cost of medical treatment</li> <li>• Reduced the length of time in the hospital</li> <li>• Developing the quality of service of a multidisciplinary team</li> <li>• Improving the quality of hospital services</li> </ul>	<ul style="list-style-type: none"> <li>• Increased the ability of the patients to perform daily activities</li> <li>• Reduced complications and disabilities in stroke patients</li> </ul>
Paksee et al. <sup>26</sup> (2016) Central Thailand	Quasi-experimental research	N: Con. = 25; male: 53.3% N: Int. = 25; male: 50.0% Mean age: 63.73 years Married > 56.67% Education level: primary school > 90.0%	N/A	<ul style="list-style-type: none"> <li>• The mean scores of caregiver readiness, stress, and relative satisfaction after receiving the discharge planning program were significantly higher than in the control group (<math>p &lt; .05</math>)</li> </ul>
Pongcharoen & Maneewong <sup>27</sup> (2013) Central Thailand	Quasi-experimental research	N: Con. = 30 Male: 73.3% N: Int. = 30 Male: 80.0% Age: 60 years (53.3%) Married > 93.3% Education level: primary school > 76.67%	N/A	<ul style="list-style-type: none"> <li>• The readiness scores of caregivers in the intervention group (<math>M = 2.97-3.20</math>, <math>SD = 0.62-0.93</math>) and control group (<math>M = 2.67-3.13</math>, <math>SD = 0.81-1.04</math>) were high.</li> <li>• Average readiness scores in both the control and intervention groups were not statistically significant (<math>p &gt; .05</math>)</li> </ul>
Satitpun <sup>28</sup> (2012) Central Thailand	Quasi-experimental research	N: Con. = 30; male: 50% N: Int. = 30; male: 43.3% Age: > 61 years (70.0%) Married > 50% Education level: primary school > 76.67%	<ul style="list-style-type: none"> <li>• The lengths of hospital stays after receiving the discharge planning program were significantly lower than before receiving the program (<math>p &lt; .05</math>)</li> <li>• The 28-day readmission rate was 3%</li> <li>• The Care Map program for ischemic stroke patients decreased lengths of hospital stays significantly (<math>p &lt; .05</math>)</li> </ul>	<ul style="list-style-type: none"> <li>• The overall treatment knowledge of stroke patient caregivers who received the program was significantly higher than it was before they received the program (<math>p &lt; .05</math>)</li> </ul>
Srisang <sup>29</sup> (2020) Central Thailand	Quasi-experimental research	N = 30; male: 36.70% Mean age: 66.83 years	N/A	<ul style="list-style-type: none"> <li>• The mean knowledge scores of patients who received the nursing discharge plan program were significantly higher than they were before patients received the program (<math>t = 5.711</math>, <math>p = .001</math>)</li> <li>• After two weeks of discharge, 90% of the sample achieved their goal attainment</li> <li>• 50% of the patients met the self-care requirements for taking medication, diet control, and daily activity</li> <li>• 40% of the patients met the requirement of receiving continuous treatment with regular follow-up and rehabilitation</li> </ul>

Note: Con. = control group, Int. = Intervention group, UTI = urinary tract infection, QOL = Quality of life, N/A = not applicable

**Intervention Providers**

All studies were nurse-led and provided education for each individual as the primary treatment delivery modality. In addition, 53.85% of the studies were implemented only on nurses (n = 7), while 46.15% (n = 6) of the studies were conducted on nurses and multidisciplinary teams (e.g., nurses, physicians, occupational therapists, psychiatrists, nutritionists, pharmacists, social workers, and public health officials) (see Table 2).

**Discharge Planning Interventions**

Most studies offered stroke knowledge manuals, videos, and education (teaching, demonstrations, skills training,

and practice). There were significant improvements in self-care,<sup>24</sup> stroke knowledge,<sup>24</sup> stroke readiness,<sup>21,26,27</sup> and satisfaction<sup>23,31</sup> in the experimental group. In addition, discharge planning interventions significantly decreased rehospitalization rates,<sup>14,21,28</sup> complications (e.g., pneumonia, pressure sores, and urinary tract infections),<sup>14,23</sup> costs of care,<sup>23</sup> and lengths of hospital stays.<sup>14,24</sup> The durations of discharge planning interventions were two months,<sup>17,21,22,24-26</sup> three months,<sup>28,29</sup> four months,<sup>4,14</sup> five months,<sup>27</sup> six months,<sup>30</sup> and eight months.<sup>23</sup>

**Table 2.** Discharge Planning Interventions

Author	Major Intervention Provider	Duration of Intervention	Discharge Planning Program
Arunsuriyasak et al, <sup>31</sup> (2019)	<ul style="list-style-type: none"> <li>• Nurse</li> <li>• Technical nurse</li> <li>• Practical nurse</li> <li>• Nurse aid</li> </ul>	4 months	<ol style="list-style-type: none"> <li>1. Preparation before starting daily work/job</li> <li>2. Preparation before the clients arrive (people, materials, documents, area)</li> <li>3. Impressive hospitality from the beginning</li> <li>4. Providing urgent services according to the nature of each client</li> <li>5. Providing services according to hierarchy and according to the nature of work until complete</li> <li>6. Providing services before clients leave</li> <li>7. Providing continuous service to subsequent clients</li> <li>8. Recording information and continuing care</li> </ol>
Buapin et al, <sup>17</sup> (2019)	<ul style="list-style-type: none"> <li>• Nurse</li> <li>• Multidisciplinary team</li> </ul>	2 months	<p>Phase 1: In the hospital</p> <ol style="list-style-type: none"> <li>1. Evaluation of discharge planning and continuing care needs.</li> <li>2. Set goals and plan care with a multidisciplinary team.</li> <li>3. Follow the plan based on the best care practices:                             <ul style="list-style-type: none"> <li>• Education, skill practice, and demonstrations followed the D-METHOD, which provides a guide on how to practice and care for stroke patients</li> </ul> </li> </ol> <p>Phase 2: Continuous care after discharge</p> <ol style="list-style-type: none"> <li>1. Followed-up by phone call</li> <li>2. Home visited</li> <li>3. QOL of stroke patients assessed</li> </ol>
Budratana <sup>21</sup> (2020)	<ul style="list-style-type: none"> <li>• Nurse</li> </ul>	2 months	<ol style="list-style-type: none"> <li>1. Assess the problems of the patient and family</li> <li>2. Show a video about stroke knowledge and patient practice</li> <li>3. Teach and demonstrate basic care skills</li> <li>4. Demonstrate basic reverse care skills</li> <li>5. Teach and demonstrate specialized care skills</li> <li>6. Transmit knowledge of drug intake and scheduled visits</li> </ol>
Bumrungpun et al, <sup>22</sup> (2010)	<ul style="list-style-type: none"> <li>• Nurse</li> </ul>	2 months	<p>Followed the Care Map model for discharge planning preparation:</p> <ol style="list-style-type: none"> <li>1. Assessment of problems and needs for post-discharge care</li> <li>2. Nursing planning for the discharge of patients</li> <li>3. Putting the plan into action</li> <li>4. Monitoring and evaluation</li> </ol>
Grisnapant <sup>23</sup> (2008)	<ul style="list-style-type: none"> <li>• Nurse</li> <li>• Multidisciplinary team</li> </ul>	8 months	<p>Followed the Clinical Pathway planning system for patients with stroke:</p> <ol style="list-style-type: none"> <li>1. Evaluation of patients and their main caregivers</li> <li>2. Planning and setting up goals for each patient</li> <li>3. Nursing care according to the clinical pathway system</li> <li>4. Monitoring care</li> <li>5. Evaluation</li> <li>6. Planning for patient returning to community</li> </ol>
Hattachot <sup>24</sup> (2017)	<ul style="list-style-type: none"> <li>• Nurse</li> </ul>	2 months	<p>Followed the D-METHOD for stroke patient care:</p> <ol style="list-style-type: none"> <li>1. Patient discharge plan</li> <li>2. Care guidelines</li> <li>3. Handbook on the role of personnel in the health team</li> <li>4. Guide for patients and caregivers</li> <li>5. Health team's patient discharge plan compliance record form</li> </ol>

Author	Major Intervention Provider	Duration of Intervention	Discharge Planning Program
Jakping <sup>25</sup> (2009)	<ul style="list-style-type: none"> <li>• Nurse</li> </ul>	2 months	Followed the METHOD model for patient care: <ol style="list-style-type: none"> <li>1. Assessment of problems and nursing needs in post-discharge care</li> <li>2. Nursing planning for the discharge of patients</li> <li>3. Putting the plan into action</li> <li>4. Monitoring and evaluation</li> </ol>
Juntawises et al, <sup>14</sup> (2004)	<ul style="list-style-type: none"> <li>• Nurse</li> <li>• Physician</li> <li>• Physiatrist</li> <li>• Nutritionist</li> <li>• Pharmacist</li> <li>• Social worker</li> </ul>	4 months	<ol style="list-style-type: none"> <li>1. Assessment of patients' hospital records and caregivers' needs within 24–48 hours</li> <li>2. Planning and putting the plan into action and collaborating with the multidisciplinary team</li> <li>3. Contacted the patients and caregivers every 24–48 hr. until discharge</li> <li>4. Provided information to patients and caregivers about stroke and health care by teaching individuals and groups (i.e., providing a health care manual, a video on the care of stroke patients, and demonstrations for patients and relatives to practice in matters that require continued care at home)</li> <li>5. Monitoring and evaluation</li> </ol>
Kongkiatpun <sup>30</sup> (2013)	<ul style="list-style-type: none"> <li>• Nurse</li> <li>• Physician</li> <li>• Physiatrist</li> <li>• Nutritionist</li> <li>• Pharmacist</li> </ul>	6 months	The JCAHO conceptual framework consists of six elements: <ol style="list-style-type: none"> <li>1. Ethics and protection of the rights of the elderly</li> <li>2. Assessment of stroke conditions in the elderly</li> <li>3. Management for stroke patients undergoing rehabilitation and discharge planning</li> <li>4. Provided information about stroke care</li> <li>5. Home visits and continuing care</li> <li>6. Improving the quality of services with respect to the feasibility of applying the guideline</li> </ol>
Paksee et al. <sup>26</sup> (2016)	<ul style="list-style-type: none"> <li>• Nurse</li> </ul>	2 months	Followed a discharge planning program combined with a Transitional Care Model (TCM): <p>Phase 1: In the hospital</p> <ul style="list-style-type: none"> <li>• Find the primary caretaker or relative, provide knowledge and practice skills, and health benefits resources</li> </ul> <p>Phase 2: At home</p> <ul style="list-style-type: none"> <li>• Follow-up visitation at home and follow-up by phone</li> </ul>
Pongcharoen et al. <sup>27</sup> (2013)	<ul style="list-style-type: none"> <li>• Nurse</li> </ul>	5 months	Discharge planning program <ol style="list-style-type: none"> <li>1. Education (teaching and demonstration)</li> <li>2. Teaching materials (lesson plans, videos, and manuals)</li> </ol>
Satitpun <sup>28</sup> (2012)	<ul style="list-style-type: none"> <li>• Nurse</li> <li>• Psychiatric nurse</li> <li>• Physician</li> <li>• Physiatrist</li> <li>• Nutritionist</li> <li>• Pharmacist</li> </ul>	3 months	Followed the Care Map model: <ol style="list-style-type: none"> <li>1. Pre-test by measuring the knowledge of patients before experiments</li> <li>2. Provide the information required by the Care Map:               <ul style="list-style-type: none"> <li>• General diagnostic tests, drug management, education about food, movement, excretion, and health care, teaching and referring patients, and discharge planning</li> </ul> </li> <li>3. Post-test to measure the knowledge of patients after experiments</li> </ol>
Srisang <sup>29</sup> (2020)	<ul style="list-style-type: none"> <li>• Nurse</li> </ul>	3 months	Followed the METHOD model: <ol style="list-style-type: none"> <li>1. Assessment of patients after they have been in the hospital for 24 hours</li> <li>2. Assessment of patients' and caregivers' needs at 48 and 72 hours</li> <li>3. Phone call to follow-up on symptoms by using Line application to remind patients two days before appointments</li> <li>5. Home visits two weeks after discharge</li> </ol>

Four reviews<sup>17,24,25,29</sup> were conducted using the D-METHOD model<sup>32</sup> to develop discharge planning interventions. The D-METHOD model consists of: (1) D: Disease (stroke disease knowledge); (2) M: Medicine (medications and side effects); (3) E: Environment (proper arrangement of the environment); (4) T: Treatment (the goal of treatment); (5) H: Health (skills and health behaviors); (6) O: Outpatient (the importance of follow-up); and D: Diet (appropriate food). This model can improve self-care,<sup>29</sup> quality of life,<sup>17</sup> and stroke knowledge.<sup>24,25,29</sup> Indeed, discharge planning using the D-METHOD model can decrease the length of hospital stays.

The lengths of stays for stroke patients after receiving the discharge planning program were significantly lower than before the program ( $p < .05$ ), and this intervention decreased 28 days readmission rates by 3% over 3 months.<sup>28</sup>

Bumrungpun et al.<sup>22</sup> used the Care Map model to develop a discharge planning intervention that included an assessment of problems and needs in post-discharge care, nursing planning for the discharge of patients, steps to put the plan into action, and subsequent monitoring and evaluation of the intervention. They found that the quality of life (QOL) of stroke patients in the experimental group

was significantly higher ( $p < .05$ ) than before they received the program, and the overall mean score among stroke survivors of awareness of responsibility to the nursing profession after using the discharge planning intervention was higher than before the intervention was implemented ( $p < .05$ ).<sup>22</sup> Meanwhile, Kongkiatpun<sup>30</sup> used the JCAHO model, which consists of six elements: (1) ethics and protection of the rights of the elderly; (2) assessment of stroke conditions in the elderly; (3) management of stroke patients undergoing rehabilitation and discharge planning; (4) provision of information about stroke care for the elderly; (5) home visits and ongoing care; and (6) improving service quality with respect to the feasibility of applying the guidelines. This intervention was effective and can be used in practice to increase the abilities of patients to perform daily activities while reducing complications and disability in stroke patients over 6 months.<sup>30</sup> Only one study<sup>26</sup> implemented discharge planning by using the transitional care model (TCM)<sup>33</sup> to develop the intervention. This model combines the self-care knowledge of the caregiver treating the patient, the management of care stress, and the adjustments required when assuming the role of caregiver. They found that mean scores of caregiver readiness, stress, and relative satisfaction after receiving the discharge planning program were significantly higher than in the control group ( $p < .05$ ) after 3 months.<sup>26</sup>

#### **Outcomes of Discharge Planning Interventions**

The current review categorized the outcomes of 13 studies into two categories: clinical and patient-related outcomes. The clinical outcomes included quality of care,<sup>30,31</sup> rehospitalization rates,<sup>14,21,23,28</sup> death rates,<sup>23</sup> lengths of hospital stays,<sup>14,23,25,28,30</sup> and costs of care.<sup>23,30,31</sup> In terms of patient-related outcomes, we included self-care ability,<sup>25,30</sup> stroke knowledge,<sup>24,29</sup> quality of life,<sup>17,22</sup> readiness,<sup>21,26,27</sup> complications (e.g., pneumonia, pressure sores, and urinary tract infections),<sup>14,23,30</sup> satisfaction,<sup>23,31</sup> and stroke caregivers' knowledge.<sup>28</sup> Six of the thirteen studies did not measure the clinical outcomes of discharge planning interventions.<sup>17,22,24,26,27,29</sup>

## **DISCUSSION**

Discharge planning is an important and sustainable healthcare strategy for transferring and continuing care for patients from the hospital to their home or community. Discharge planning has been around since the first patient was admitted to the first hospital, including stroke patients. The purpose of this integrative review was to examine the effects of discharge planning interventions on Thai stroke patients. Overall, a total of 13 intervention studies from five databases that met the study's eligibility criteria were synthesized and included in the review. The review confirmed and highlighted the significance of additional nursing and medical research aimed at increasing the self-care ability, quality of care, quality of life, and satisfaction of stroke patients. Furthermore, discharge planning interventions can also decrease the lengths of hospital stays, rehospitalization rates, complication rates, and costs of care for Thai stroke survivors.

Buapin *et al.*<sup>17</sup> found that those who received discharge planning interventions in the experimental group had higher quality of life scores ( $t_{14} = 14.50$ ,  $p < .001$ ) than before receiving the program ( $t_{28} = 3.63$ ,  $p < .001$ ). Similarly, Bumrunpun *et al.*<sup>22</sup> found that discharge planning preparation models improved quality of life scores in stroke survivors in the experimental group, and that the scores were significantly higher than before

patients received interventions ( $p < .05$ ). Previous studies have also confirmed that discharge planning programs can improve quality of life scores in stroke patients after one and three months ( $179.27 \pm 29.66$  vs.  $150.44 \pm 39.70$ ).<sup>34,35</sup> Along the same lines, previous research teams have indicated that nurse care management using discharge planning interventions that focus on helping stroke survivors to relearn daily activities can improve their quality of life.<sup>36,37</sup>

40% to 96% of stroke survivors who stayed in the hospital had complications, and this was commonly associated with poor outcomes.<sup>38,39</sup> Several studies show that longer hospital stays were associated with complications in stroke patients.<sup>40-42</sup> However, several studies also reported that discharge planning interventions using nurses and multidisciplinary teams led to significantly fewer complications,<sup>14,23</sup> lengths of hospital stays,<sup>14,23,25,28,30</sup> rehospitalization rates,<sup>14,21,23,28</sup> and costs of care.<sup>23,30,31</sup> Additionally, discharge planning interventions can increase the quality of hospital services,<sup>30</sup> the satisfaction of patients, healthcare providers, and caregivers,<sup>23,26,31</sup> and stroke knowledge and problem management.<sup>24,25,28,29</sup>

Discharge planning interventions have strengths, including (1) assessment of the patients' and caregivers' needs; (2) planning and setting up goals that are suitable for each patient; and (3) preparing quality of care and health outcomes in home settings before beginning discharge planning. With regard to the assessment of patients' and caregivers' knowledge and understanding of stroke, healthcare providers should initiate discharge planning for stroke survivors in the early stages of hospitalization.<sup>43</sup> Nurses, multidisciplinary teams, and caregivers are close to their patients; they are very supportive and motivated to provide care to their patients.<sup>44-46</sup> For patients and caregivers to receive a good quality of care, continuity, and cost-effective services, systematic preparation of the patients and caregivers is required. This includes effective discharge planning in accordance with the organization policy as well.<sup>47,48</sup>

## **IMPLICATIONS FOR FUTURE RESEARCH AND PRACTICE**

This integrative review synthesized evidence to inform healthcare providers and the public about the effects of discharge planning interventions on stroke survivors. The findings of this review demonstrated the importance of discharge planning interventions for effectively preventing stroke survivors' rehospitalization and reducing their complications and mortality. However, in Thailand, there is still little evidence on the effectiveness of discharge planning interventions for stroke survivors. Hence, nurses, healthcare teams, and researchers should implement these interventions for stroke patients.

## **LIMITATIONS**

We have several potential limitations in this review. First, the sample size in the six studies was a small number (3–25), so the comparison among variables could be ambiguous. Second, we did not search in gray literature databases (i.e., non-peer-reviewed studies on internet-based search engines). Third, we searched and included studies in both English and Thai, which may have omitted relevant studies conducted in other languages and other countries. Finally, this review included only Thailand, so we might have missed out on pertinent intervention studies implemented in other areas. However, the review also has some strengths: (1) it was rigorously conducted,

with the research team following a strict integrative review methodology and preventing bias through two researchers independently extracting and evaluating the quality of the studies; (2) when examining the content before reviewing, analyzing, extracting, and discussing the results, we included only high-quality discharge planning intervention studies.

## CONCLUSION

The current review has provided baseline information for the development of discharge planning for patients with stroke by preparing caregivers and family members using discharge education and care coordination by multidisciplinary teams. Our findings confirmed that discharge planning intervention is an essential strategy in transferring patients from the hospital to home. This integrative review suggested that discharge planning interventions can decrease rehospitalization rates, complications, lengths of hospital stays, and costs of care. In addition, these interventions can increase quality of care, patient and caregiver knowledge, patient quality of life, and the satisfaction of patients, caregivers, and healthcare providers.

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No ethical approval was needed.

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## CONFLICT OF INTEREST

The authors declare no conflicts of interest.

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