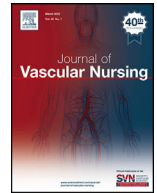




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# The transitional care from hospital to home for stroke survivors and their caregivers: A systematic review

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**Purpose:** To describe transitional care after hospital discharge to home in stroke survivors and their caregivers.

**Design:** A systematic review was conducted using the Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA) guidelines.

**Methods:** A systematic review was conducted using the following electronic databases: PubMed, CINAHL, Scopus, and Web of Science. This systematic review included studies examining transition care from hospital to home in stroke survivors.

**Results:** Thirty studies were included in this systematic review. The main intervention observed in this systematic review was educational. Intervention programs, such as health coaching activities, home visits, telephone follow-up, and informative intervention during transition care from hospitals to home, could improve quality of life, self-efficacy, physical function, and activities of daily living in both stroke survivors and caregivers. This systematic review will help nurses and physicians to implement specific interventions during transitional period for stroke survivors, supporting and improving care delivery during this critical period.

**Conclusions:** This study supports educational and informative interventions to improve the physical functioning, quality of life, and self-efficacy of stroke survivors and reduce caregiver strain.

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## Introduction

Stroke represents the second leading cause of death and a leading cause of disability worldwide.<sup>1</sup> Globally, the prevalence of stroke is estimated to be 2.7 %.<sup>2</sup> In the United States, approximately 7.6 million people aged  $\geq 20$  years have experienced a stroke,<sup>2</sup> while in Europe, the number stands at 1.1 million people.<sup>3</sup> Stroke prevalence significantly increases with advancing age in both males and females.<sup>2,3</sup>

Stroke has a significant impact on survivor's physical, psychological, and social abilities.<sup>4</sup> Following a stroke, survivors often experience functional and cognitive disabilities,<sup>5</sup> such as depression, anxiety, impacts on mobility and movement, difficulties with self-care, fatigue, and communication problems.<sup>6–8</sup> These disabilities negatively impact stroke survivors' Quality of Life (QoL),<sup>9</sup> especially

during the period following hospital discharge and the transition to home.<sup>10,11</sup> Indeed, stroke survivors may need long-term rehabilitation after discharge.<sup>11</sup> The first month at home represents a critical time for transition, and stroke survivors experience multiple psychosocial issues as they adapt to changes in their social connectedness,<sup>12</sup> reorient to a changed life, and learn to manage health conditions at home.<sup>13</sup>

The transition period from hospital to home will also impact caregiver health. Currently, caregivers play a fundamental role in transition to home.<sup>6</sup> For example, studies have shown that after discharge, caregivers often feel isolated, lack professional health-care support, and are unprepared for this role, leading to increased anxiety, depression, and burden.<sup>14,15</sup> This can cause increased errors in care, duplication of services or missed treatments for stroke survivors, resulting in a higher risk of patient readmission.<sup>16</sup>

Transitional care is defined as 'the movement of patients among providers, different goals of care, and across the various settings where healthcare services are received'.<sup>17</sup> Hospital-to-home transition period is a vulnerable and stressful period for stroke survivors and their caregivers.<sup>9,18,19</sup> During this time, stroke survivors and their caregivers are adapting to self-care at home while continuing to

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engage in rehabilitation.<sup>20</sup> Stroke survivors, same as caregivers, may experience a variety of unmet needs, including needs for more services, information, and therapy, indicating poor communication.<sup>10</sup> A poor transitional care program could increase the possibility of readmission of stroke survivors due to a variety of factors, such as poor access to rehabilitation care, lack of stroke-related education and information, poor medication adherence, psychosocial factors like depression, stress, and high caregiver burden.<sup>6,21</sup>

Although several studies were conducted on stroke survivor transition period from hospital to home, no systematic reviews have summarized the effects of transitional care in stroke survivors and caregivers.<sup>8,20,22–24</sup> Indeed, several systematic reviews were conducted on stroke survivors<sup>13,25–28</sup> and caregivers<sup>13,27</sup> but they were more focused on studying the effectiveness of transitional care in stroke survivors. For example, the long-term effect of transitional care on readmission, mortality, length of hospital stay, and function,<sup>25,26,28</sup> or the efficacy of support interventions from organized stroke services to independent living at home for stroke survivors and their caregivers<sup>27</sup> and the barriers to its implementation. However, to our knowledge, no existing literature reviews specifically evaluated the need for implementing efficient and effective transitional care to enhance stroke survivors' and caregivers' self-management, improve QoL, and reduce depression and anxiety at home. This systematic review will help provide health care to implement specific interventions that will help support and improve care delivery in the transitional period for patients who have experienced stroke.

This review will be crucial in moving from isolated interventions to implementing efficient and effective transitional care across various healthcare settings. As a result, it will contribute to improving both the physical and psychological outcomes of stroke survivors and their caregivers. Therefore, this systematic review aims to describe the transitional period after hospital discharge to home for stroke survivors and their caregivers.

## Methods

### Study design

The present systematic review was conducted following the Preferred Reporting Items for Systematic Reviews and Meta-analysis checklist (PRISMA) and was registered at PROSPERO (identification number: CRD42023384896).

### Eligibility criteria

Studies eligible for the review had to fulfill the following criteria: randomized controlled trials (RCTs), cross-sectional studies, qualitative studies, and examined transitional period from hospital to home in stroke survivors. The exclusion criteria were as follows: reviews, books or reports, duplicate articles, and studies not involving human participants (if any).

### Search strategy

A comprehensive search was conducted in October 2022 using the following electronic databases: PubMed, CINAHL, Scopus, and Web of Science. The search strategy included a combination of synonyms of free text and MeSH (Medical Subject Headings) terms. To identify additional studies, we also examined the reference lists of retrieved articles. The following search string was used: “transitional care”, “transition to home”, “transition home”, “caregiver preparedness to transition”, “preparedness assessment for transition home”, and “stroke”. The followed search string was used: “(“transitional care” OR “transition to home” OR “transition home” OR

PATH OR “preparedness to transition” OR “preparedness assessment for transition home”) AND stroke AND (patient OR survivors OR caregiver OR caregiver OR carer OR dyad)”.

### Selection process and data collection process

The references obtained from the search string of each database were exported to Endnote v.x6, where duplicates were removed and uploaded to Rayyan 28. Data were extracted by the primary reviewer and verified by a secondary reviewer; any disagreements were resolved by third reviewer. Secondly, the remaining studies were examined in full text, and data extraction was performed. In the third phase, non-conformities, and disagreements regarding the inclusion of the studies were resolved by consensus between the two reviewers; otherwise, the conflicts were resolved by a third reviewer.

Data extraction was performed in Microsoft ACCESS® 2007 2016 via a tool intentionally built by the research team. The following information was extracted: author and study setting, participant recruitment method, type of interventions and type and duration of training, study groups, sample characteristics, duration of follow-up, outcomes assessed, type of technology involved, measures of treatment fidelity, use of a behavior change theory to guide the intervention, and involvement of caregivers.

### Population

The review included studies on stroke survivors aged 18 years and older with ischemic or hemorrhagic stroke who were discharged from the hospital to home, and their caregivers.

### Intervention

The intervention of interest in RCTs must have been focused on the transitional care during discharge from hospital to home. In addition, they should have supported stroke survivors and/or caregivers. The interventions may have been managed by a multidisciplinary team or not and must have begun before discharge from the hospital and continued after hospital discharge with follow-up at home.

### Study risk of bias assessment

The selected studies were evaluated for methodological quality by two independent researchers using the critical appraisal tool of the Joanna Briggs Institute (JBI) for evaluating RCTs,<sup>29</sup> as shown in Table 1. To evaluate the qualitative studies, the researchers used the JBI Checklist for Qualitative Research, which is shown in Table 2. Any disagreement between reviewers was resolved through discussion or consultation with a third reviewer. The JBI checklist for RCT studies made it possible to analyze the presence or absence of bias in the RCT studies selected. The risk of bias in the included studies was assessed by two reviewers (MV and GP) using the JBI Critical Appraisal Checklist for RCT studies, the JBI Checklist for Qualitative Studies, and the JBI Checklist for Analytical Cross-Sectional Studies, with supervision from a third reviewer. Based on these assessments, the studies were rated as having a low, high, or unclear risk of bias.

## Results

### Study selection

Literature searches identified 699 records after duplicates were removed. After reading the full text, 30 articles were selected for inclusion in the review (Fig. 1).

**Table 1**  
Methodological quality of the RCTs.

| Criterion                                                                             | Lin et al., 2021 | Shyu et al., 2010 | Shyu et al., 2008 | Deng et al., 2020 | Kam Yuet at al, 2022 | Chalermwannapong et al., 2010 | Liu et al., 2018 | Qian, 2019 | Hughes et al., 2019 | Duncan et al., 2020 | Geng et al. 2019 | Wong et al., 2015 |
|---------------------------------------------------------------------------------------|------------------|-------------------|-------------------|-------------------|----------------------|-------------------------------|------------------|------------|---------------------|---------------------|------------------|-------------------|
| 1. Was true randomization used for assignment of participants to treatment groups?    | +                | +                 | +                 | +                 | +                    | +                             | +                | +          | +                   | +                   | –                | +                 |
| 2. Was allocation to treatment groups concealed?                                      | +                | +                 | +                 | +                 | +                    | +                             | +                | +          | +                   | +                   | +                | +                 |
| 3. Were treatment groups similar at the baseline?                                     | +                | +                 | +                 | +                 | +                    | +                             | +                | +          | +                   | +                   | +                | +                 |
| 4. Were participants blind to treatment assignment?                                   | +                | +                 | +                 | +                 | +                    | +                             | +                | +          | +                   | +                   | +                | +                 |
| 5. Were those delivering treatment blind to treatment assignment?                     | +                | +                 | +                 | +                 | +                    | +                             | +                | +          | +                   | +                   | +                | +                 |
| 6. Were outcomes assessors blind to treatment assignment?                             | +                | +                 | +                 | +                 | +                    | +                             | +                | +          | +                   | +                   | +                | +                 |
| 7. Were treatment groups treated identically other than the intervention of interest? | +                | +                 | +                 | +                 | +                    | +                             | +                | +          | +                   | +                   | +                | +                 |

(continued on next page)

**Table 1** (continued)

| Criterion                                                                                                                                     | Lin et al.,<br>2021 | Shyu et al.,<br>2010 | Shyu et al.,<br>2008 | Deng et al.,<br>2020 | Kam Yuet<br>at al, 2022 | Chalermwannapong<br>et al., 2010 | Liu et al.,<br>2018 | Qian, 2019 | Hughes<br>et al., 2019 | Duncan<br>et al., 2020 | Geng et al.<br>2019 | Wong et al.,<br>2015 |
|-----------------------------------------------------------------------------------------------------------------------------------------------|---------------------|----------------------|----------------------|----------------------|-------------------------|----------------------------------|---------------------|------------|------------------------|------------------------|---------------------|----------------------|
| 8. Was follow up complete and if not, were differences between groups in terms of their follow up adequately described and analyzed?          | +                   | +                    | +                    | +                    | +                       | +                                | +                   | +          | +                      | +                      | +                   | +                    |
| 9. Were participants analyzed in the groups to which they were randomized?                                                                    | +                   | +                    | +                    | +                    | +                       | +                                | +                   | +          | +                      | +                      | +                   | +                    |
| 10. Were outcomes measured in the same way for treatment groups?                                                                              | +                   | +                    | +                    | +                    | +                       | +                                | +                   | +          | +                      | +                      | +                   | +                    |
| 11. Were outcomes measured in a reliable way?                                                                                                 | +                   | +                    | +                    | +                    | +                       | +                                | +                   | +          | +                      | +                      | +                   | +                    |
| 12. Was appropriate statistical analysis used?                                                                                                | +                   | +                    | +                    | +                    | +                       | +                                | +                   | +          | +                      | +                      | +                   | +                    |
| 13. Was the trial design appropriate, and any deviations from the standard RCT design accounted for in the conduct and analysis of the trial? | +                   | +                    | +                    | +                    | +                       | +                                | +                   | +          | +                      | +                      | +                   | +                    |

+=Yes; -=No; ?="Unclear"; N/A: not applicable.

**Table 2**  
Methodological quality of the qualitative research.

| Criterion                                                                                                                                          | Rodrigues et al.,<br>2013 | Connolly et al.,<br>2018 | Camicia et al.,<br>2020 | Yeung et al.,<br>2011 | Govender et al.,<br>2019 | Hodson et al.,<br>2016 | Chen et al.,<br>2022 | Gustafsson et al.,<br>2013 | Gustafsson et al.,<br>2014 |
|----------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|--------------------------|-------------------------|-----------------------|--------------------------|------------------------|----------------------|----------------------------|----------------------------|
| 1. Is there congruity between the stated philosophical perspective and the research methodology?                                                   | +                         | +                        | +                       | +                     | +                        | +                      | +                    | +                          | +                          |
| 2. Is there congruity between the research methodology and the research question or objectives?                                                    | +                         | +                        | +                       | +                     | +                        | +                      | +                    | +                          | +                          |
| 3. Is there congruity between the research methodology and the methods used to collect data?                                                       | +                         | +                        | +                       | +                     | +                        | +                      | +                    | +                          | +                          |
| 4. Is there congruity between the research methodology and the representation and analysis of data?                                                | +                         | +                        | +                       | +                     | +                        | +                      | +                    | +                          | +                          |
| 5. Is there congruity between the research methodology and the interpretation of results?                                                          | +                         | +                        | +                       | +                     | +                        | +                      | +                    | +                          | +                          |
| 6. Is there a statement locating the researcher culturally or theoretically?                                                                       | +                         | +                        | +                       | +                     | +                        | +                      | +                    | +                          | +                          |
| 7. Is the influence of the researcher on the research, and vice- versa, addressed?                                                                 | +                         | +                        | +                       | +                     | +                        | +                      | +                    | +                          | +                          |
| 8. Are participants, and their voices, adequately represented?                                                                                     | +                         | +                        | +                       | +                     | +                        | +                      | +                    | +                          | +                          |
| 9. Is the research ethical according to current criteria or, for recent studies, and is there evidence of ethical approval by an appropriate body? | +                         | +                        | +                       | +                     | +                        | +                      | +                    | +                          | +                          |
| 10. Do the conclusions drawn in the research report flow from the analysis, or interpretation, of the data?                                        | +                         | +                        | +                       | +                     | +                        | +                      | +                    | +                          | +                          |

+ = Yes; - = No; ? = "Unclear"; N/A: not applicable.

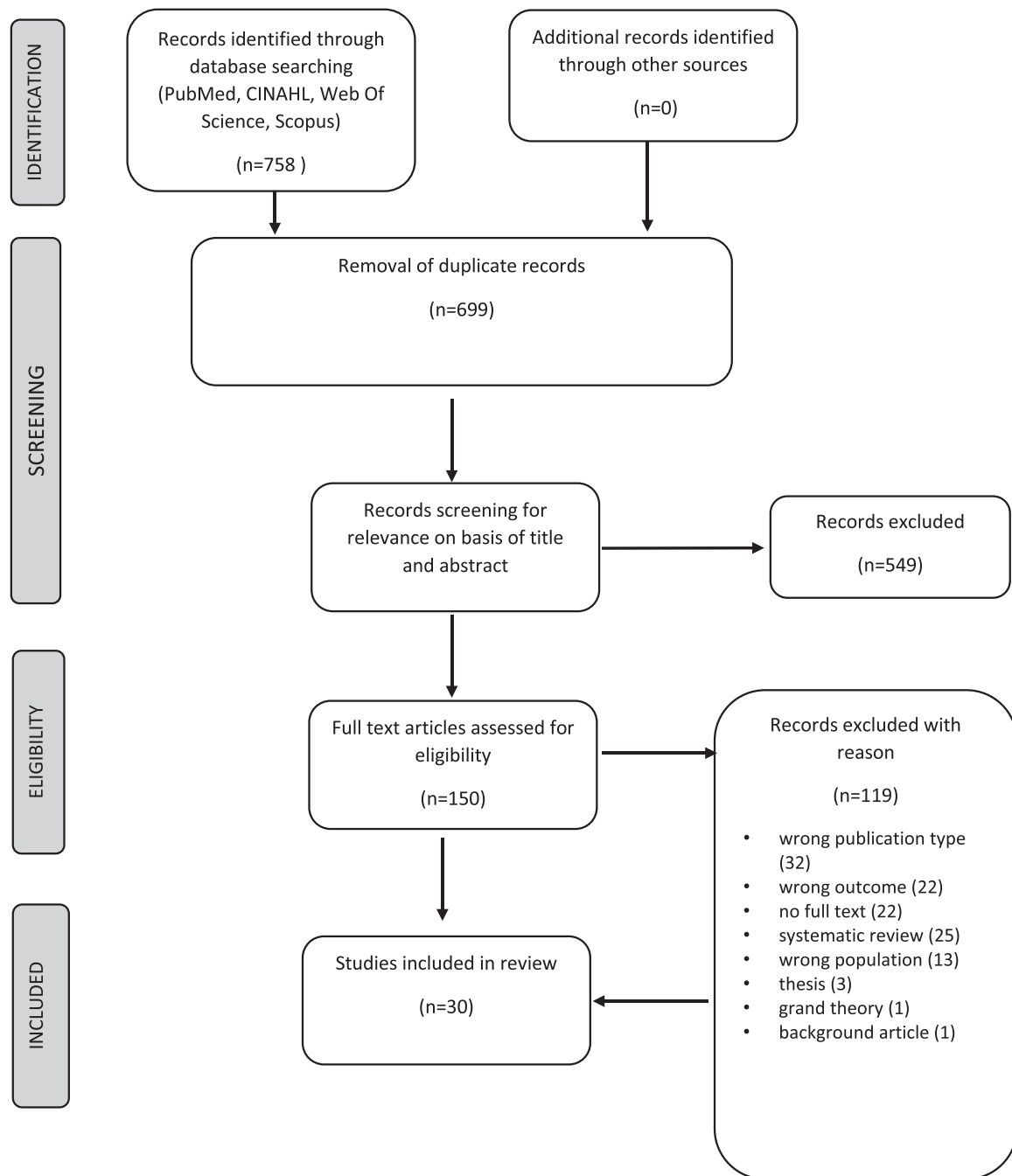


Fig. 1. Flow diagram.

The RCTs and qualitative studies were evaluated according to the critical evaluation tools from JBI, the other types of studies (i.e., text and opinion, mixed-methods studies, etc.) for material evaluations were not established with JBI. Each study was included based on the quality critical appraisal tool. Fourteen articles were RCTs,<sup>7,11,20,22,23,30–38</sup> nine qualitative studies,<sup>8,12,24,39–44</sup> two text and opinion,<sup>18,45</sup> two mixed-method studies,<sup>5,9</sup> one cross sectional study,<sup>6</sup> one pragmatic priority setting,<sup>10</sup> and one retrospective study.<sup>19</sup>

#### Methodological quality

The methodological quality of the twelve RCTs is summarized in Table 1. All studies provide information about the allocation and

treatment between the interventional and control groups. In each study, participants were adequately randomized, and their outcomes were measured in the same way for the treatment groups. Analyzing the methodological quality, all studies obtained a score of 100.

The methodological quality of the nine qualitative studies is summarized in Table 2. Regarding the qualitative studies, all achieved a high score in the methodological quality.

#### Study characteristics

In the RCTs, twelve studies that enrolled 7164 stroke survivors (male: 3665, female: 3499) with a high prevalence of ischemic stroke (approximately 85 %), were included in this review (Table 3).

**Table 3**  
Characteristics of the RCTs included.

| Authors, year (Location)<br>Type of study | Participants                                            | Intervention                                                                                                                                                                                                                                                                                                                                                                                                                              | Follow-up                                     | Outcome measures                                                                                                                                                                                                                                                                                                                                                                                                     | Duration of intervention |
|-------------------------------------------|---------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|
| Lin S. et al., 2022<br>China RCT          | 140 stroke survivors<br>(M:106;<br>F:34) + caregivers   | Health coaching activities<br>I step: (1) establishment of transitional care goals; (2) enhancing and improving self-care skills; (3) modification of the home environment; (4) enhancing physical function; (5) medication management; and (6) management and prevention of stroke adverse events.<br>II step: 12- weeks follow-up intervention: telephone support and bi-weekly face-to-face coaching activities at the patient clinic. | Baseline 12 weeks 24 weeks                    | Stroke Self-efficacy Questionnaire (SSEQ): > 12 e 24 weeks<br>Stroke-Specific Quality of Life Scale (SSQoL-12):> Chinese Stroke Prevention Knowledge Questionnaire (SPKQ): > Modified Caregiver Strain Index (CSI):< Stroke Health Coaching Diary: <hospital readmission                                                                                                                                             | 12 weeks                 |
| Kam Yuet et al., 2022<br>China RCT        | 116 stroke survivors<br>(M:81; F:35)                    | 4c (comprehensiveness, Continuity, Coordination, Collaboration) home-based post-discharge program (4C-HBP): 1 pre-discharge session (meeting two days prior) 6 post-discharge home visits 6 telephone follow-up calls                                                                                                                                                                                                                     | 90 days<br>180 days                           | EQ-5D-5 L (Chinese): mobility, self-care, usual activities, pain/discomfort, anxiety and depression > over time in the intervention group at 90 days Stroke Impact Scale (SIS). > at 90 and 180 days in seven subscale Modified Barthel Index (MBI) SEMCD-6 (Self-Efficacy for Managing Chronic diseases 6 items)                                                                                                    | 12 weeks                 |
| Wong FKY et al., 2015<br>China RCT        | 108 stroke survivors<br>(F:68- M: 39) 54 vs 54          | Transitional care program before and for 4 weeks after discharge (home visiting 2v/week + telephone follow-up)                                                                                                                                                                                                                                                                                                                            | 4 weeks<br>8 weeks                            | SF-36: PCS and MCS > intervention at 4–8weeks WHO-QOL-SRPB (spiritual): > intervention in all dimensions at 4–8weeks Patient satisfaction questionnaire (PSQ-HK): > intervention in total score at 4–8 w MBI (Barthel): >intervention group at 4–8 w CES-D (depression): <intervention at 4 –8w mbi: metabolic indicators, ADL, QoL (SF-36), stroke recurrence. All items + at 3 and 6 months after the intervention | 4 week                   |
| Geng G., 2019<br>China RCT                | 60 stroke survivors<br>(M:36; F:24)                     | Before discharge: bedside health education and learning book 1 to 3 months After discharge: 1 weekly visit + telephone follow up                                                                                                                                                                                                                                                                                                          | baseline,<br>1 months<br>3 months<br>6 months | Model of Chronic Care Model Components 3 groups: UC (Usual Care) – SWCM (social worker–led case Management) - SWCM + Website                                                                                                                                                                                                                                                                                         | 3 months                 |
| Hughes et al., 2019<br>Michigan RCT       | 265 stroke survivors<br>(M:134; F:131)                  |                                                                                                                                                                                                                                                                                                                                                                                                                                           | 7 days<br>90 days                             | PROMIS (Patient-Reported Outcomes Measurement Information System): > in over time in SWCM+Website PAM (Patient Activation Measurement): > in SWCM+Website PHQ-9 (Patient Health Questionnaire) (depression): =Neuro-QoL: Anxiety: < in SWCM+Website s-mRS:< in SWCM+Website. Significant difference SWCM+Website/SWCM                                                                                                | 1 day                    |
| Duncan P.W., 2020<br>North Carolina RCT   | 40 hospitals: 5882 stroke survivors<br>(M:2925; F:2957) | telephone follow-up within 2 bins messes the day of hospital discharge + 1 clinic visits occur 7 to 14 days post-discharge.                                                                                                                                                                                                                                                                                                               | 90 days                                       | No difference in the readmission rate SIS-16 at 90 days: no difference intervention group: +survival, + satisfaction with care, -depression, disability, mortality                                                                                                                                                                                                                                                   | 2 visits                 |
| Qian C., 2019<br>China RCT                | 72 stroke survivors<br>(M:56; F:16)                     | a small-class health education curriculum + for compliance with patients' relevant instruction + self-designed diary.                                                                                                                                                                                                                                                                                                                     | 3 days<br>12 weeks<br>after discharge         | Patient compliance: + rehabilitation program + lifestyle + return visits and follow up ADL - BI: + 12 weeks NHPT (Nine Hole Peg Test): > in total score 3days-12 weeks in intervention group SQOL (Subjective Quality of Life): + at 12 weeks Utilization of health service: + outpatients visit in the control group PSHC (patient satisfaction with hospital care): + intervention and control                     | 5-week                   |

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Table 3 (continued)

| Authors, year (Location)<br>Type of study   | Participants                         | Intervention                                                                                                                                           | Follow-up                       | Outcome measures                                                                                                                                                                                                                                                                             | Duration of<br>intervention                         |
|---------------------------------------------|--------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------|
| Liu L., 2018<br>China RCT                   | 40 stroke survivors<br>(M:24; F:16)  | before discharge assessing and education + brochures and instruction the patients to functional exercises                                              | 1 month<br>3 months<br>6 months | functional exercise compliance questionnaire developed by Zhenxiang Zhang et al.: 1–3–6 months + Physical exercise, +monitoring + active advice seeking SF-36: 1 month + all SF-36, 3 month: + all/ = VT, 6 month: + all/=RP                                                                 | telephone follow up 1 month after discharge         |
| Chalermwannapong S., 2010<br>Thailandia RCT | 67 stroke survivors<br>(M:39; F: 28) | stroke survivors and caregivers received routine hospital care and Transitional Care Program: discharge planning, home follow-up and telephone visits. | baseline<br>12 weeks            | MBI: 12 weeks > intervention QLI-Stroke Version: in experimental group + in all dimensions at 12 weeks.                                                                                                                                                                                      | 24–48 h after being admitted in hospital to 2 weeks |
| Shyu Y.L., 2008<br>China RCT                | 158 stroke survivors<br>(M:89; F:69) | inpatient health education+referral services as well as post discharge telephone follow-ups and home visits                                            |                                 | Nurse evaluation of Caregiver Preparation Scale: > before discharge Caregiver self-preparation: intervention > 1 month intervention Caregiver preparation: intervention > after discharge Caregiver satisfaction: intervention > after discharge                                             |                                                     |
| Deng A, 2020 China RCT                      | 98 stroke survivors<br>(M:62; F:36)  | home visits: home rehabilitation, medication reconciliation, self-management education                                                                 | Baseline 4 weeks 8 weeks        | SF-36: PCS > intervention group at 4–8 weeks MCS > intervention group at 4–8 weeks MBI: > intervention group at 4–8 weeks Caregiver Strain Index: < intervention group at 8 weeks                                                                                                            | 8 weeks                                             |
| Shyu Y.L., 2010<br>Asia and China RCT       | 158 stroke survivors<br>(M:73; F:85) | intervention in hospital: assess, consultation and provide individualized discharge post-hospital: home visiting during weeks 1 and 3 after discharge  | Baseline month 1–3–6–12         | HRQoL (health Related Quality of Life): = intervention vs control CBI (Chinese Barthel Index) FCCI (Family Caregiving Consequence Inventory): Quality of care: > at 1–3–6 month. = at 12months. Social functioning:< at 3 months No difference in readmission rate during the first 12 month | 3 weeks                                             |

Ten studies were conducted in Asia: nine in China,<sup>11,20,23,30–34,36</sup> and one in Thailand.<sup>7</sup> Two studies were from the United States: one in Michigan<sup>35</sup> and one in North Carolina.<sup>22</sup>

Qualitative studies (Table 4) were divided into five studies focused only on stroke survivors,<sup>8,24,41–43</sup> two studies that included both stroke survivors ( $N = 17$ ) and their caregivers ( $N = 23$ ),<sup>12,39</sup> and two studies that involved 35 caregivers.<sup>40,44</sup> Four studies were conducted in Australia,<sup>12,39,41,43</sup> two studies in the United States,<sup>8,44</sup> one study in Brazil,<sup>42</sup> one study in China,<sup>40</sup> and one study in Africa.<sup>24</sup> Four studies used different theoretical frameworks: the dimension of occupational therapy,<sup>43</sup> the Model of Care for the Elderly After Cerebrovascular accident,<sup>42</sup> the phenomenological approach described by Giorgi,<sup>40</sup> and Gadamer's philosophical hermeneutics.<sup>39</sup>

### Interventions

Data on the type of interventions implemented in the experimental groups in the RCTs started during hospitalization and continued at home after discharge. In one study, the intervention was focused only on hospitalization.<sup>35</sup> The interventions described in these studies were health coaching activities,<sup>36</sup> telephone follow-up,<sup>7,22,30,31,33,34</sup> home visits,<sup>20,23</sup> and home visits with informative interventions, such as a written clinical stroke survivor guide, self-designed diary, and brochure.<sup>11,32</sup> The duration of the intervention was different among studies: 12 weeks,<sup>31,34,36</sup> eight weeks,<sup>23</sup> five weeks,<sup>32</sup> four weeks,<sup>11,30,33</sup> three weeks,<sup>20</sup> two weeks,<sup>7</sup> and one day.<sup>35</sup> Markle-Reid et al. conducted a mixed-method study where the objective was to investigate the efficacy of

an integrated transitional care intervention for community-based seniors with stroke.<sup>9</sup>

### Outcomes measured

The outcomes measured were QoL,<sup>7,11,20,22,23,30–32,36</sup> self-efficacy,<sup>31,36</sup> activities of daily living,<sup>7,11,20,30–32,34</sup> and caregiver outcome, such as caregiver preparation, satisfaction, and burden of illness.<sup>23,33,36</sup> There was an elevated heterogeneity in the typology of measure of stroke survivor outcomes. QoL was analyzed through seven different scales: Stroke-Specific QoL Scale (SSQoL-12),<sup>36</sup> EQ-5D-5 L,<sup>31</sup> Stroke Impact Scale (SIS),<sup>22,31</sup> Short Form-36 (SF-36),<sup>11,23,30</sup> Subjective QoL (SQoL),<sup>32</sup> QLI-Stroke Version,<sup>7</sup> PROMIS,<sup>35</sup> and Health-Related QoL (HRQoL).<sup>20</sup> Self-efficacy was measured with two scales: Stroke Self-Efficacy Questionnaire (SSEQ)<sup>36</sup> and Self-Efficacy to Manage Chronic Disease Scale (SEMCD-6).<sup>31</sup> Caregiver outcomes were measured with two scales: Modified Caregiver Strain Index (CSI)<sup>23,36</sup> and Family Caregiving Consequence Inventory (FCCI).<sup>20</sup> The different outcomes were measured at various times depending on the study, and the specific time points for each study are detailed in Table III. One RCT was focused on dyads of older stroke survivors and their family caregivers.<sup>33</sup>

The aims of the qualitative studies are different. They explore and examine the transitional care in family caring, the life experiences of stroke survivors, the role of caregivers, the communication during transitional care, and the experience of stroke survivors in a social community (Table IV). In these studies, different cultural factors appear, such as local discharge practices and cultural models for transition of care.

**Table 4**  
Characteristics of the qualitative studies included.

| Authors, year (Location)           | Participants                                            | Theoretical framework used                                     | Aims                                                                                                                                                                             | Theme identified                                                                                                                                                                                                                                                                                                                                                                                        |
|------------------------------------|---------------------------------------------------------|----------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Rodrigues A.P., 2013<br>Brazil     | 10 stroke survivors<br>(M = 5, F = 5) age mean:<br>77.5 | Model of Care for Elderly<br>After CVA                         | <ul style="list-style-type: none"> <li>examine the transition of care in families caring for an elderly person who had suffered the first episode of CVA.</li> </ul>             | <ul style="list-style-type: none"> <li>health system transfers the responsibility to the family without making the transition for this care in partnership</li> <li>the family have difficulties in providing care to stroke survivors</li> <li>change in a family relationship, reorganization of family</li> <li>new strategy for the stroke survivors</li> </ul>                                     |
| Connolly T., 2018<br>US            | 31 stroke survivors (M:17, F:14) age mean:56            | not specified                                                  | <ul style="list-style-type: none"> <li>examine the life experience of ischemic stroke survivors during transitional care</li> </ul>                                              | <ul style="list-style-type: none"> <li>shock of a stroke interrupting a normal day</li> <li>transition to an unfamiliar home</li> <li>uncertainty focused on the emotional reactions to their situation after returning. Anxiety</li> <li>understanding a new sense of self</li> <li>adjusting to a new sense of self</li> </ul>                                                                        |
| Camicia M., 2020<br>US             | 20 caregivers                                           | not specified                                                  | <ul style="list-style-type: none"> <li>understand caregivers' concerns about the long-term implications of stroke and the caregiving role after completing the PATH-s</li> </ul> | <ul style="list-style-type: none"> <li>uncertainty: clinical question, in caregivers, long-term implication, resource needs, physical ability</li> <li>PATH-s stimulated the caregivers to anticipate what issues and questions they needed to consider</li> </ul>                                                                                                                                      |
| Yeung A.M., 2011 China             | 15 stroke caregivers (M:7, F:8) mean age: 64,7          | The phenomenological approach described by Giorgi (1985, 1997) | <ul style="list-style-type: none"> <li>explore the phenomenon of experience in stroke survivors</li> </ul>                                                                       | <ul style="list-style-type: none"> <li>physical insult of stroke was the braking point of the holistic self</li> <li>change between hospital and home in holistic nature</li> <li>reliance on external control</li> <li>internalization of the illness as guilt</li> </ul>                                                                                                                              |
| Govender P., 2018 Africa           | 8 stroke survivors (M:3, F:5) mean age: 56,1            | not specified                                                  | <ul style="list-style-type: none"> <li>explore the community reintegration experience</li> </ul>                                                                                 | <ul style="list-style-type: none"> <li>loss of autonomy: a sense of dependency following their CVA.</li> <li>barriers to community reintegration, stigma in the community</li> <li>social isolation</li> <li>joy in resuming premorbid activities and roles</li> <li>support from their family, parents and friends.</li> <li>Suggest rehabilitation programs within their home environment.</li> </ul> |
| Hodson T et al., 2016<br>Australia | 7 stroke survivors (F:4, M:3)                           | dimension of occupational therapy                              | <ul style="list-style-type: none"> <li>understand the experience of home for people with stroke after discharge</li> </ul>                                                       | <ul style="list-style-type: none"> <li>sense of loss in your roles and occupation</li> <li>loss of control, loss of freedom, independence, privacy, and safety in their home</li> <li>sense of change when stroke survivors interact with others in their home</li> <li>change in routine and rhythms</li> </ul>                                                                                        |

(continued on next page)

Table 4 (continued)

| Authors, year (Location)          | Participants                                                                            | Theoretical framework used           | Aims                                                                                                                                                                                                  | Theme identified                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|-----------------------------------|-----------------------------------------------------------------------------------------|--------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Chen et al., 2022 Australia       | 12 stroke survivors + 18 caregivers. Five people with stroke were unable to participate | Gadamer's philosophical hermeneutics | <ul style="list-style-type: none"> <li>explore the shared experience of people with stroke and caregiver preparedness to manage post-discharge care</li> </ul>                                        | <ul style="list-style-type: none"> <li>psychological and emotional stress due to loss of function, inability to walk safely</li> <li>stroke suddenly changes the lives of caregivers</li> <li>Resilience of people with stroke was enhanced by their functional achievements and family support, whereas caregivers' resilience was built on their internal strength, past life experience and pre-existing coping strategies</li> <li>Acceptance of stroke-related functional impairments seemed to enhance optimism for people with stroke about their ability, rather than their disability</li> </ul>                                                                                |
| Gustafsson et al., 2012 Australia | 5 stroke survivors (M:1, F:4) 5 caregivers                                              | not specified                        | <ul style="list-style-type: none"> <li>to enhance our understanding of the transition experience for clients with stroke and their caregivers during discharge and the first month at home</li> </ul> | <p>PATIENTS</p> <ul style="list-style-type: none"> <li>importance of rehabilitation gym</li> <li>the period immediately after coming home was a time when all clients were faced with many changes to themselves and their daily life</li> <li>support and assistance at home: community-based services, medical follow-up, family, and friends</li> </ul> <p>CAREGIVERS:</p> <ul style="list-style-type: none"> <li>rehabilitation program is important for understanding abilities and progressions</li> <li>the impact in the activity all days</li> <li>looking in the future: their role as therapist and motivator, working for future recovery and hope for the future</li> </ul> |
| Gustafsson et al., 2014 Australia | 7 stroke survivors (M: 3; F:4)                                                          | not specified                        | <ul style="list-style-type: none"> <li>to investigate the experience of people with stroke during their transition from hospital to home after STRENGTH program</li> </ul>                            | <ul style="list-style-type: none"> <li>STRENGTH program has helped for transition home</li> <li>the hospital environment presented a false way of living in comparison to life at home</li> <li>sense of lost and frustration related to a perceived reduction in meaningful roles and independence</li> </ul>                                                                                                                                                                                                                                                                                                                                                                           |

## Stroke survivors

### Experience of stroke survivors

Eight qualitative studies explored the experience of stroke survivors when they returned home after hospital discharge.<sup>8,12,18,24,39–41,43</sup> After hospital discharge, stroke survivors experience a profound disruption in their daily lives, including difficulties with concentration, impaired limb movement,<sup>8</sup> changes in routine and daily rhythm,<sup>12,43</sup> loss of autonomy and control, increase dependence, and a diminished sense of role and occupation.<sup>24,39,41,43</sup>

Two qualitative studies identified the theme of uncertainty. The uncertainty focused on the emotional reaction<sup>8</sup> and physical ability<sup>44</sup> to their situation after returning at home, toward a new sense of self that required adjustment.<sup>8</sup> Yeung et al. described the experience of stroke survivors as “*physical insult*”, which represented the breaking point of the holistic self, activated by the suddenness of a stroke event, which was accompanied by physical symptoms and loss of physical abilities.<sup>40</sup> After the return home, the stroke survivors had a relied on an external control and an internationalization of the illness as guilt.

### Quality of life (QoL)

Data on QoL in stroke survivors was available in thirteen studies.<sup>7,9,11,18–20,22,23,30–32,34,36</sup> Most studies reported significant differences between stroke survivors who received treatment and those in the control group during follow-up. Specifically, QoL was higher in the intervention group compared to the control group at 12 weeks<sup>7,31,32,36</sup> and 24 weeks.<sup>31,34,36</sup>

In two studies,<sup>23,30</sup> Physical Component Summary (PCS) and Mental Component Summary (MCS), measured by SF-36, were better in the intervention group than control group at 4 weeks and 8 weeks.<sup>23,30</sup> Two studies showed better functional status and satisfaction with care and less disability, level of depression and mortality at 12 weeks<sup>22,31</sup> and 24 weeks<sup>31</sup> in the intervention group.

In one mixed-method study,<sup>9</sup> the sample consisted of 30 stroke survivors, there was no significant difference from baseline to 6 months in survivor-reported health outcomes: HRQoL (32.8 v 35.1,  $p = 0.3$ ), depressive symptoms (9.2 vs 8.6,  $p = 0.6$ ), and anxiety (4.7 vs 5.2,  $p = 0.6$ ).<sup>9</sup> Camicia et al. showed that the use of health coaching in transitional care interventions from hospitalization to home improved stroke survivor QoL, functional status, and reduced depression at 3 months.<sup>18</sup> A retrospective analysis individualized depression, fear, denial, and reluctance to rely on the help of others—the elements that may affect transitional care in stroke survivors.<sup>19</sup>

### Self-efficacy

Data on the effect of the intervention on stroke survivor self-efficacy were available in four studies.<sup>9,31,32,36</sup> Stroke survivors who received intervention programs showed major improvements in self-efficacy in lifestyle and managing chronic disease, to return visits and long-term follow-up. Only Markle-Reid et al. observed no statistically significant differences from baseline to 6 months in patient self-efficacy (7.4 vs 8.1,  $p = 0.1$ ).<sup>9</sup>

### Activities of daily living (ADLs)

Data on the effect of intervention on stroke survivors in activities of daily living (ADLs) were available in eight RCTs.<sup>7,11,12,20,23,30–32,34</sup> In all RCT studies, the level of ADLs in stroke survivors was the same at baseline and at follow-up was better in the intervention group than the control group. One study described the theme of rehabilitation gym both for stroke survivors and their caregivers, highlighting the importance of understanding abilities and progression over time.<sup>12</sup> Acceptance of stroke-related functional impairments seemed to enhance optimism for people with stroke about their ability, rather than their disability.<sup>39</sup>

### Needs

Theme of stroke survivor's needs was available in two qualitative studies.<sup>6,10</sup> Hughes et al. identified the unmet needs of stroke survivors, and the most prevalent needs were education about stroke, financial, and health related.<sup>38</sup> There was not a statistically significant difference between stroke type and stroke severity. Solbakken et al. identified a list of research needs relating to care during the transition period from a hospital stroke unit to rehabilitation in healthcare: patient and caregiver needs, disabilities after stroke, information flow, collaboration, and common understanding among health personnel.<sup>10</sup>

### Social community

Data on the community integration of stroke survivors was available in four qualitative studies.<sup>12,18,24,43</sup> One study described

the barriers to community reintegration for stroke survivors and the presence of stigma in the community related to social isolation.<sup>24</sup> Qualitative studies surfaced the sense of change when stroke survivors interacted with other people in their home.<sup>43</sup> In two studies, key components for providing transitional care to home after inpatient stroke care were supported by social community, such as accessible community resources,<sup>18</sup> and community-based services and medical follow-up.<sup>12</sup>

### Hospital readmission and post-discharge adverse events

Data on hospital readmission were available in four RCT studies.<sup>20,30,35,36</sup> In one study, the intervention group demonstrated a reduction of hospital readmissions during the 24-week follow-up.<sup>36</sup> Meanwhile, in three studies, no statistical differences were observed in readmission rates between the intervention and control groups.<sup>20,30,35</sup> Data on post-discharge adverse events were available in one RCT study.<sup>36</sup> Adverse events such as a second stroke, falls, bedsores, and urinary tract infection was not statistically significantly different in adverse events that occurred in the intervention group.<sup>36</sup>

### Caregiver

Data on the effect of the intervention on caregivers were available in three RCTs.<sup>23,33,36</sup> In two studies, the caregiver perception strain in the intervention group was less than the control group at follow-up.<sup>23,36</sup> In Shyu et al. after inpatient health education and post-discharge telephone follow-ups, the caregiver preparation in the intervention group was well above the control group.<sup>33</sup> Five qualitative studies explored the role of caregivers and family in the process of transitional care.<sup>12,24,39,42,44</sup> Rodriguez et al. showed that the health system transferred the responsibility to the family without making the transition care for this care in partnership, providing changes in family relationships, and requiring a reorganization of family.<sup>42</sup> Two studies showed the importance of social support from family, parents, and friends for stroke survivors.<sup>24,39</sup> Two studies highlighted caregiver difficulties in providing care to stroke survivors.<sup>12,42</sup> Camicia et al. developed an instrument, PATH-s (Preparedness Assessment for the Transition Home After Stroke), for assessing the gaps in caregiver transition preparedness from institutional setting to home to identify and evaluate the primary prevention strategies to implement during transitional period.<sup>5</sup> This instrument stimulated caregivers to anticipate what issues and questions they needed to consider.<sup>44</sup> Theodoros et al. proposed a transitional care innovation model, based on Lewin's model,<sup>46</sup> where the family caregivers of stroke survivors play a crucial role in national strategy policymaking, since these caregivers undertake great responsibility in providing quality care at home.<sup>45</sup>

### Discussion

This systematic review describes the transitional care strategies after hospital discharge to home to improve stroke survivor and caregiver outcomes (i.e., QoL, self-efficacy, hospital readmission, ADLs, stroke survivor needs, social integration, and caregiver burden). In our review, 30 articles were included, and 20 were assessed for the methodological quality on transitional care for stroke survivors from hospital to home. All studies analyzed adequately satisfied the quality items, such as evidence of allocation concealment at randomization, details of study sample withdrawal, and inclusion and exclusion criteria for the study sample. The RCTs primarily involved an educational intervention with telephone follow-up and supplementary informative materials (e.g.,

brochures and a self-designed diary). The duration of these interventions varied across the studies.

The outcomes measured are described regarding stroke survivors and caregivers. In every qualitative study, the theme of stroke survivors' experiences when they return home after hospital discharge is similar and characterized by loss and uncertainty. Stroke survivors experience a loss of autonomy, loss of control, diminished roles and occupations, and a sense of uncertainty regarding emotional responses, physical abilities, and long-term implications. The onset of a stroke in an adult person creates a crisis for the family because of the role constraints and role changes, the burden of physical care, and the interruption of interpersonal relationships within the family.

The QoL in stroke survivors in the first month after hospital discharge is significantly better in the intervention group than the control group; however, over time, smaller differences in QoL values between the intervention group and control group are observed. In Reeves et al., the greatest result in terms of QoL was observed in a stroke survivor home-based Social Worker-led Case Management (SWCM) program combined with a website with stroke-related information when compared to usual care and only the SWCM program.<sup>35</sup> In a recent systematic review and network meta-analysis by Tyler et al. the authors concluded that none of the interventions were associated with an improved QoL.<sup>28</sup> However, this systematic review was conducted analyzing several populations with chronic conditions and this could explain the differences with our review. Regarding ADLs, Jee et al. found no significant differences in ADLs between the transitional care methods, including early supported discharge, and conventional treatment.<sup>25</sup> In this review, most of the selected studies observed an improvement of self-efficacy in lifestyle and managing chronic disease in stroke survivors allocated in the intervention group.<sup>31,32,36</sup> Stroke can cause functional and cognitive disability and lead to difficulty in ADLs. In this review, stroke survivors included in the intervention group showed an increase in ADL performance compared with the control group.

Themes of stroke survivor's needs emerged in this review, as in Chen et al. systematic review.<sup>13</sup> Our review has identified the unmet needs of stroke survivors and their caregivers during transitional care from hospital to home. The unmet needs included more service, information, therapy, communication, and education.<sup>6,10</sup> If these needs are detected early, interventions may change the outcomes in stroke survivors and their caregivers during transitional period from hospital to home. Identifying unmet needs for stroke survivors and/or their caregivers as they transition among facilities likely poses one of greatest gaps in stroke care and for development of self-management capacities for long-term stroke management at home.

In this review and in the RCTs, the fundamental role of caregivers during the transitional care process from hospital to home emerged and showed the increase of caregiver perception of strain from lack of educational program preparation.<sup>23,33,36</sup> When stroke survivors are discharged from hospital to home, caregivers often feel unprepared, and this lack of preparedness increases their burden, anxiety, and depression levels. A PATH-s instrument was developed for helping health professions to identify individualized gaps in caregiver preparedness during transition.<sup>5</sup> During this transitional period, the communication between the healthcare professional, caregiver, and stroke survivor is essential for an optimal transition at home.

This systematic review has several clinical and scientific implications. Firstly, our systematic review suggests that intervention programs, such as health coaching activities, home visits, telephone follow-up, and informative intervention during transitional period from hospital to home could improve QoL, self-efficacy, and

ADLs in both stroke survivors and caregivers, especially in the first months after hospital discharge. This systematic review is important because it could help nurses and physicians implement specific interventions that support and improve care delivery during the transitional period for patients who have experienced a stroke.

Moreover, the review has uncovered critical issues in reporting and bias risks, raising awareness among researchers that much still needs to be done to improve the methodological quality of the trials in this field. Our study provides a general overview of the possible interventions that may be implemented in stroke survivors during transitional care and provides evidence for researchers and healthcare providers who plan to design and implement interventions to optimize transitional care.

However, our systematic review has also several limitations. First, although we used thorough search strategies to minimize inclusion and publication biases, it is still possible that some studies were missed. The stroke severity was not adequately addressed in the studies included. This can be a bias in evaluating stroke survivor and caregiver outcomes and for generalizability.

## Conclusion

The results of this study provide support for the use of an educational and informative intervention in improving outcomes in both stroke survivors and their caregivers during the transition period to home following discharge. The transition from the hospital setting to home and community is one of the most vulnerable and critical events in the continuum of care for stroke survivors and their families. In addition, such interventions can help alleviate caregiver burden, particularly in healthcare systems where the responsibility of care is increasingly shifted to families. Information about survivor or caregiver needs, abilities, and support once they are transitioned home from the acute setting, rehabilitation facility, or skilled nursing facility is important to evaluate. Providing an individualized comprehensive care plan from the multidisciplinary team, with survivor and caregiver involvement, that outlines goals and treatment strategies would be beneficial to survivors as they transition through multiple care settings and providers. The opportunity to expand the nursing role to a stroke nurse liaison who provides consultant care management across all settings may be more effective in facilitating care transition in stroke survivors and their caregivers.

## Fundings

This study was funded by the Center of Excellence for Nursing Scholarship, Rome, Italy.

## Source of funding

This project was funded by the Center of Excellence for Nursing Scholarship, Rome, Italy.

## Declaration of competing interest

The authors declare there are no conflict of interest.

## CRediT authorship contribution statement

**Mayra Veronese:** Writing – original draft, Validation, Resources, Methodology, Investigation, Conceptualization. **Ercole Vellone:** Validation, Methodology, Investigation, Conceptualization. **Rosaria Alvaro:** Validation, Resources, Methodology, Investigation, Conceptualization. **Gianluca Pucciarelli:** Writing – review & editing, Validation, Supervision, Methodology, Investigation, Conceptualization.

## Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.jvn.2025.03.002.

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