An Update on the State of the Evidence for Stroke Family Caregiver and Dyad Interventions

Tamilyn Bakas, PhD, RN; Michael McCarthy, PhD; Elaine T. Miller, PhD, RN

Strok... care of family members who are often unprepared for the caregiving role and lack training from healthcare providers. As a result, many stroke family caregivers experience burden, depressive symptoms, and reduced health-related quality of life. Aside from these individual issues, caregivers commonly experience interpersonal and organizational issues. Interpersonal issues reflect changes in relationships with the survivor and others, impacting roles and social activities. Organizational issues involve difficulty in finding resources and services.

The American Heart Association/American Stroke Association published a scientific statement with evidence-based recommendations for stroke family caregiver and dyad interventions that are summarized in 5 main areas (Table I in the online-only Data Supplement). Dyad interventions were defined as those that targeted both the stroke survivor and the family caregiver, with both being active participants in the intervention. Intervention studies that involved family caregivers in the intervention, but did not target the health or well-being of the caregiver, were not considered to be dyad interventions. The recommendations were based on a critical analysis of 17 caregiver and 15 dyad intervention studies found in the literature between January 1990 and October 2012. Because of the rapidly growing literature in this area, the purpose of this article is to provide an update on the state of the evidence for stroke family caregiver and dyad interventions published between November 2012 and December 2016.

Methods

A critical analysis of published stroke family caregiver and dyad intervention studies was conducted using the following inclusion criteria: (1) written in the English language; (2) published from November 2012 through December 2016; (3) used a quasi-experimental or experimental research design; (4) involved a stroke caregiver or dyad intervention; (5) included stroke survivor or family caregiver outcomes; and (6) was implemented during any part of the stroke care continuum. Dissertations, books, and conference proceedings were excluded. As in the original statement, we searched MEDLINE, PubMed, CINAHL, and PsycINFO using the keywords stroke, family, caregiver, interventions, experimental studies, and quasi-experimental studies. Additional sources were located from reference lists of relevant articles. We tracked the search process using a Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) flow diagram (Figure). Articles meeting our inclusion criteria were abstracted into Tables II and III in the online-only Data Supplement. Consensus was reached on article inclusion by all authors. The studies were critiqued using criteria from the Consolidated Standards of Reporting Trials (CONSORT) and Transparent Reporting of Evaluations With Nonrandomized Designs (TREND) statements and assessed for threats to validity. Findings were compared with recommendations made in the original scientific statement.

Results

Based on our PRISMA flow diagram in Figure, we identified 10 studies9–18 that met our inclusion criteria (5 caregiver intervention studies9–13 and 5 dyad intervention studies14–18).

Critique of the 10 Articles

Designs

Six of the 10 studies were experimental designs that involved randomization of caregivers or dyads to intervention or usual care groups. One large study used cluster randomization by unit. The remaining 3 studies were quasi-experimental (eg, nonrandom assignment to condition15,16 or single group15).

Samples

Total sample sizes ranged from N=1915 to N=928.11 Five studies had sample sizes of <50.10,12,14,15,17 These studies should be interpreted with caution, particularly because small pilot studies do not provide meaningful effect size estimates for larger studies, let alone enough power for hypothesis testing. Some smaller studies reported statistically significant results, which could have resulted from Type I error. Likewise, nonsignificant findings could have resulted from Type II error. Small pilot studies are useful in testing feasibility of recruitment, retention, and implementation of the intervention, among other procedures; however, intervention effectiveness cannot be adequately determined in these studies. Four studies10,13,16,18 had moderate sample sizes ranging from N=11916 to N=254,9 and one study was large (N=928).11

Interventions

Most studies provided detailed descriptions regarding the intervention, although 1 was unclear as to the actual number of...
sessions provided. Treatment fidelity (ie, design, training of interveners, delivery, receipt, and enactment) was described in only 2 studies, yet, is an important factor in testing and reporting interventions.

Outcomes
Outcomes were assessed with measures that had evidence of reliability and validity, although some studies used modified scales or single items. Outcomes are further detailed in Table IV in the online-only Data Supplement.

Generalizability
One study limited enrollment to spousal dyads. The rest included all types of informal caregivers, such as family or friends. Recruitment setting and stage of recovery ranged from inpatient/acute/early discharge to those who had used adult daycare services for at least 12 months. One study included caregivers of survivors who were between 6 months and 5 years poststroke. Two studies included caregivers of survivors who were ≥60 years of age, resulting in limited generalizability for survivors who are in early to midlife and experiencing the unique stressors that accompany those life stages. Six countries were represented (United States, Canada, United Kingdom, Germany, Netherlands, and Korea), many with drastically different healthcare systems and cultural norms around illness recovery and caregiving, raising further questions about generalizability; however, these studies provide a more global perspective.

What Types of Family Caregiver and Dyad Interventions Are Best?

Target of Interventions
The recommendation that caregiver interventions are preferred for caregiver outcomes and that dyad interventions are preferred for survivor outcomes is supported by the studies reviewed. For example, 3 of the caregiver studies did not measure survivor outcomes and the 2 that did did not find significant results. All of the dyad intervention studies reported at least 1 significant caregiver outcome; however, most were primarily targeted toward the survivor with positive survivor outcomes.

Types of Interventions
Six of the intervention studies used a combination of skill building and psycho-educational strategies, whereas 4 studies used psycho-educational strategies alone. Recommendations from the original scientific statement emphasized the importance of using a combination of skill-building and psycho-educational interventions. Skill-building strategies focus on processes, such as problem solving, stress management, goal setting, or hands on training. Psycho-educational interventions involve the provision of information about stroke. Support interventions facilitate interactions with peers for support and advice (eg, support groups, online discussion forums). None of the 10 studies used support interventions as defined here; however, evidence is lacking regarding the effectiveness of these types of interventions.

Mode of Delivery
Most interventions used face-to-face delivery or a combination of face to face and telephone, with 2 studies being delivered completely by telephone. These studies adhere to recommendations from the original scientific statement for face-to-face and telephone interventions. One study was delivered via the web. The current lack of web-based interventions is noteworthy, considering the increase in technology use among a wide variety of family caregivers.

Frequency of Sessions
The total number of sessions ranged from one self-directed session to an unlimited number of sessions, with the number of sessions being unclear in one study. Current recommendations are for 5 to 9 sessions. Studies that fell within 5 to 9 session reported positive caregiver or survivor...
outcomes; however, so did those that reported having 12 to 20 sessions. The 2 studies that had an unlimited number of sessions, or where the number of sessions were unclear, were not as successful.

**Discussion and Conclusions**

**Best Designed Studies**

Out of the 10 studies reviewed, 3 were deemed the best designed studies based on their randomized controlled design and adequate sample size. While 2 of these studies used mailed information control groups, Bakas et al used an attention control group that received the same number of contacts from nurses as the intervention group, addressing an important threat to validity. This study also reported details regarding treatment fidelity and incorporated >1 type of skill building as part of the intervention.

Studies with small sample sizes teach us a great deal about feasibility of recruitment, implementation of the intervention, and preliminary data trends. It was fascinating that the largest study (N=928) reported no significant findings, although they only had 2 outcomes: survivor activities of daily living and caregiver burden. The authors admitted challenges in implementing a large multisite study. Furthermore, the number of sessions provided to caregivers was uncertain, and attention to treatment fidelity was likely compromised. Cluster randomization by site could have also influenced the results.

**Comparison of Findings With Recommendations**

Overall, the recommendations in the original scientific statement were supported by the findings in these 10 studies published between November 2012 and December 2016. Studies should include measures of survivor outcomes when testing caregiver interventions to demonstrate the benefits of these interventions on the survivor. Dyad interventions could be better designed in the future to provide more emphasis on the health and well-being of the family caregiver. Most of the dyad interventions reviewed placed a majority of emphasis on how to care for the stroke survivor, rather than on how to take care of oneself as a family caregiver. Consistent with current recommendations, most interventions are incorporating skill-building strategies in addition to providing psycho-education, while providing more tailored or individualized approaches to meet assessed needs of survivors and caregivers. While most interventions continue to be delivered face to face or by telephone, it is likely that more web-based or technologically enhanced approaches will emerge over the coming years.

**Disclosures**

Dr Bakas has received prior stroke family caregiver research funding from the National Institutes of Health, National Institute of Nursing Research, R01NR010388. The other authors report no conflicts.

**References**


**TAKE-HOME POINTS**

- Several recommendations exist for designing and testing stroke caregiver and dyad interventions that continue to be supported by this updated review.
- A careful critique of existing intervention studies is needed to best evaluate the evidence in this area.
- Future studies with more rigorous designs and larger sample sizes are needed, along with interventions that focus more on the health and well-being of the family caregiver.
- Web-based and other technology-enhanced modes of delivery should be offered to meet the changing needs of technologically diverse caregivers.

Key Words: clinical trial ▪ depression ▪ family caregiving ▪ stress ▪ stroke care
An Update on the State of the Evidence for Stroke Family Caregiver and Dyad Interventions
Tamilyn Bakas, Michael McCarthy and Elaine T. Miller

Stroke, published online March 28, 2017;
Stroke is published by the American Heart Association, 7272 Greenville Avenue, Dallas, TX 75231
Copyright © 2017 American Heart Association, Inc. All rights reserved.
Print ISSN: 0039-2499. Online ISSN: 1524-4628

The online version of this article, along with updated information and services, is located on the World Wide Web at:
http://stroke.ahajournals.org/content/early/2017/03/28/STROKEAHA.117.016052.citation

Data Supplement (unedited) at:
http://stroke.ahajournals.org/content/suppl/2017/03/28/STROKEAHA.117.016052.DC1

Permissions: Requests for permissions to reproduce figures, tables, or portions of articles originally published in Stroke can be obtained via RightsLink, a service of the Copyright Clearance Center, not the Editorial Office. Once the online version of the published article for which permission is being requested is located, click Request Permissions in the middle column of the Web page under Services. Further information about this process is available in the Permissions and Rights Question and Answer document.

Reprints: Information about reprints can be found online at:
http://www.lww.com/reprints

Subscriptions: Information about subscribing to Stroke is online at:
http://stroke.ahajournals.org//subscriptions/
Supplementary Table I. Summary of recommendations for stroke caregiver and dyad interventions.¹

1. **Target of interventions.** “Stroke caregiver interventions are probably recommended” over dyad interventions for caregiver outcomes; vice versa for survivor outcomes.

2. **Types of interventions.** “Interventions that combine skill building (eg, problem solving, stress management, goal setting) with psycho-educational strategies should be chosen;” “Interventions that involve only psycho-education are not recommended;” “Interventions that consist of support only or a combination of psycho-education and support do not have sufficiently strong evidence.”

3. **Intervention delivery design.** “Interventions that are tailored or individualized on the basis of the needs of stroke caregivers should be chosen;” “Postdischarge assessments with tailored interventions based on changing needs should be performed;” “Individual approaches are probably recommended over group interventions.”

4. **Mode of delivery.** “Interventions that are delivered face to face and/or by telephone are recommended;” “Interventions delivered completely by telephone can be useful;” “Interventions delivered by the Web might be considered for those with computer access.”

5. **Frequency of sessions.** “Interventions consisting of 5 to 9 sessions are recommended;” Those “with a wide range of sessions” “are not as useful.”
## Supplementary Table II. Summary of 5 Articles Testing Family Caregiver Interventions.

<table>
<thead>
<tr>
<th>Author(s) (year)</th>
<th>Sample</th>
<th>Design</th>
<th>Skill-building</th>
<th>Psycho-education</th>
<th>Support</th>
<th>Face-to-Face</th>
<th>Telephone</th>
<th>Web</th>
<th>Total # sessions</th>
<th>Survivor outcomes (p&lt;.05)</th>
<th>Caregiver outcomes (p&lt;.05)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bakas et al., 2015&lt;sup&gt;2&lt;/sup&gt;</td>
<td>N=254 T=123 C=131</td>
<td>RCT</td>
<td>X Problem solving, Stress manage, Asking HP info, skills</td>
<td>X Assess Tailored</td>
<td>9</td>
<td>9</td>
<td>Not applicable</td>
<td>Those with PHQ-9≥5: Depressive symptoms – 8, 24, 52wks Life changes – 12wks Total sample: Unhealthy days – 8wks</td>
<td>NS findings: Depressive symptoms at 12wks, Life changes 8,24,52 wks Unhealthy days 12,24,52 wks</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cameron et al., 2015&lt;sup&gt;3&lt;/sup&gt;</td>
<td>N=31 T&lt;sub&gt;staff&lt;/sub&gt;=11 T&lt;sub&gt;self&lt;/sub&gt;=10 U=10</td>
<td>RCT</td>
<td>X Assess Tailored</td>
<td>1&lt;sub&gt;staff&lt;/sub&gt; 1&lt;sub&gt;self&lt;/sub&gt; 6&lt;sub&gt;staff&lt;/sub&gt; 7&lt;sub&gt;staff&lt;/sub&gt; 1&lt;sub&gt;self&lt;/sub&gt;</td>
<td>Not applicable</td>
<td>From BL to 1,3,6 mo: T&lt;sub&gt;staff&lt;/sub&gt; improved perceived support T&lt;sub&gt;self&lt;/sub&gt; group increased mastery NS findings: Depressive symptoms, positive affect, social support at 1.3,6 mo</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Forster et al., 2013&lt;sup&gt;4&lt;/sup&gt;</td>
<td>N=928 T=450 U=478</td>
<td>RCT Cluster by unit</td>
<td>X Hands on training</td>
<td>X Assess Tailored</td>
<td>?</td>
<td>?</td>
<td>NS findings: ADLs at 6 or 12 mo</td>
<td>NS findings: Burden at 6 mo or 12</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hirsch et al., 2014&lt;sup&gt;5&lt;/sup&gt;</td>
<td>N=28 T=14 U=14</td>
<td>Quasi (not willing in control)</td>
<td>X Hands on training</td>
<td>X Info in 4 sessions</td>
<td>unlimit ed</td>
<td>unlimit ed</td>
<td>NS Findings: Rehospitalization</td>
<td>Depressive symptoms at discharge (T2) NS Findings: Depressive symptoms at BL (T1), and follow-up 4wks post discharge (T3). Prostration (discomfort) at T1,2,3 Burden at T1,2,3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Author(s) (year)</td>
<td>Sample</td>
<td>Design</td>
<td>Skill-building</td>
<td>Psycho-educaton</td>
<td>Support</td>
<td>Face-to-Face</td>
<td>Telephone</td>
<td>Web</td>
<td>Total # sessions</td>
<td>Survivor outcomes (p&lt;.05)</td>
<td>Caregiver outcomes (p&lt;.05)</td>
</tr>
<tr>
<td>-----------------</td>
<td>--------</td>
<td>--------</td>
<td>----------------</td>
<td>----------------</td>
<td>---------</td>
<td>-------------</td>
<td>-----------</td>
<td>-----</td>
<td>-----------------</td>
<td>--------------------------</td>
<td>---------------------------</td>
</tr>
<tr>
<td>Pfeiffer et al., 2014&lt;sup&gt;6&lt;/sup&gt;</td>
<td>N=122 T=60 C=62</td>
<td>RCT</td>
<td>X Problem solving</td>
<td>X Card sort (part of problem solving)</td>
<td>2</td>
<td>18</td>
<td>20</td>
<td>No applicable</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

N = Number of subjects; T = Treatment Group; C = Control Group; U = Usual care; cg = caregiver; pt = patient; NS = Not significant.
All listed outcomes indicate improvement unless listed under NS Findings.

Types of interventions include skill-building, psycho-educational, and support.<sup>1</sup>

“Skill-building – strategies that focus on processes that facilitate problem solving, goal setting, communicating with health care professionals, stress management, and hands on training in such skills as lifting and mobility techniques, assistance with activities of daily living, and communication tailored to the needs of the stroke patient.”<sup>1</sup>

“Psycho-educational- provision of information about (a) warning signs for stroke, lifestyle changes, and general resources, (b) managing survivor emotions and behaviors, (c) managing medications and personal care, (d) managing finances and transportation, and (e) managing one’s own emotions and health care needs.”<sup>1</sup>

“Support – engaging in interactions with peers for support and advice (e.g., support groups, online discussion forums).”<sup>1</sup>
Supplementary Table III. Summary of 5 Articles Testing Dyad Interventions.

<table>
<thead>
<tr>
<th>Author(s) (year)</th>
<th>Sample</th>
<th>Design</th>
<th>Skill-building</th>
<th>Psycho-education</th>
<th>Support</th>
<th>Face-to-Face</th>
<th>Telephone</th>
<th>Web</th>
<th>Total # sessions</th>
<th>Survivor outcomes (p&lt;.05)</th>
<th>Caregiver outcomes (p&lt;.05)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bishop et al., 2014(^7)</td>
<td>N=49 dyads T=23 U=26</td>
<td>RCT</td>
<td>X Problem solving</td>
<td>X Assess Tailored</td>
<td></td>
<td></td>
<td>13</td>
<td></td>
<td>13</td>
<td>Global family 6mo Criticism of subj 3mo Criticism by subj 3mo Family functioning (FAD subscales): Problem solving 6mo Communication 3,6mo Roles 3,6mo Affective responsiveness 3,6mo Affective involvement 6mo Behavioral control 3,6mo General functioning 6mo <strong>NS findings:</strong> Global health utilization 3,6mo Global family 3mo Global functioning 3,6mo Physician visits 3,6mo Therapy hours 3,6mo IADLs 3,6mo FIM 3,6mo Depressive symptoms 3,6mo Rehospitalization 3,6mo Criticism of subj 6mo Criticism by subj 6mo Family functioning (FAD subscales): Problem solving 3mo Affective involvement 3mo</td>
<td>Global family 3&amp;6mo Global functioning 3mo IADLs 3mo Criticism of subj 3,6mo <strong>SS+CG (dyad)</strong> SS+CG Global health utilization at 3mo SS+CG Global family 3&amp;6mo SS+CG physical visits 3mo Criticism of subj 3,6mo Criticism by subj 3mo <strong>NS findings (CG):</strong> Global health utilization 3,6mo Global functioning 6mo Physician visits 3,6mo Therapy hours 3,6mo IADLs 6mo Depressive symptoms 3,6mo Criticism by subj 3,6mo</td>
</tr>
<tr>
<td>Author(s) (year)</td>
<td>Sample</td>
<td>Design</td>
<td>Skill-building</td>
<td>Psycho-education</td>
<td>Support</td>
<td>Face-to-Face</td>
<td>Telephone</td>
<td>Web</td>
<td>Total # sessions</td>
<td>Survivor outcomes (p&lt;.05)</td>
<td>Caregiver outcomes (p&lt;.05)</td>
</tr>
<tr>
<td>------------------</td>
<td>--------</td>
<td>--------</td>
<td>----------------</td>
<td>------------------</td>
<td>---------</td>
<td>-------------</td>
<td>----------</td>
<td>-----</td>
<td>----------------</td>
<td>-----------------------------</td>
<td>-----------------------------</td>
</tr>
<tr>
<td>Chang et al., 2015&lt;sup&gt;8&lt;/sup&gt;</td>
<td>N=19 dyads T=19</td>
<td>Quasi (single group)</td>
<td>X Group and Individual Assess</td>
<td>Tailored</td>
<td>12</td>
<td>12</td>
<td></td>
<td></td>
<td></td>
<td>General functioning 3mo</td>
<td>Depressive symptoms 3,6mo Criticism by subj 6mo</td>
</tr>
<tr>
<td>Fens et al., 2014&lt;sup&gt;9&lt;/sup&gt;</td>
<td>N=117 pt T=62 U=55 N=74 cg T=41 U=33</td>
<td>Quasi (non-random regiona l stroke service s)</td>
<td>X Assess Tailored</td>
<td>5</td>
<td>5</td>
<td></td>
<td>Frenchay Activities Index- T6,12,18 Depression – T12 NS findings: Stroke Sickness Impact (primary)- T6,12,18 Barthel Index – T6,12,18 Anxiety –T6,12,18 Depression -T6</td>
<td>Depression – T6 NS findings: Life satisfaction (primary) – T6,12,18 Anxiety – T6,12,18 Depression –T12,18 Caregiver Strain – T6,12,18</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kim et al., 2013&lt;sup&gt;10&lt;/sup&gt;</td>
<td>N=36 dyads T=18 U=18</td>
<td>RCT</td>
<td>X Assess Tailored</td>
<td>9</td>
<td>9</td>
<td></td>
<td>Exercise 3mo Salty food 3mo Fruit and vegetable 3mo Sense of control 3mo Health motivation 3mo NS findings: Triglyceride 3mo Cholesterol 3mo Smoking 3mo Alcohol 3mo Medication adherence 3mo</td>
<td>Caregiver mastery 3mo NS findings:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ostwald et al., 2014&lt;sup&gt;11&lt;/sup&gt;</td>
<td>N=159 dyads T=79 C=80</td>
<td>RCT</td>
<td>X Skill training</td>
<td>X Assess Tailored</td>
<td>16 (average)</td>
<td>16 (average)</td>
<td></td>
<td>Health status – 6mo Cognitive – 6mo NS findings: Health status – 12mo Cognitive – 12mo</td>
<td>Health status 6mo Family support 12mo Acquiring social support 12mo NS Findings:</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Types of interventions include skill-building, psycho-educational, and support.¹

“**Skill-building** – strategies that focus on *processes* that facilitate problem solving, goal setting, communicating with health care professionals, stress management, and hands on training in such skills as lifting and mobility techniques, assistance with activities of daily living, and communication tailored to the needs of the stroke patient.”¹

“**Psycho-educational**- provision of *information* about (a) warning signs for stroke, lifestyle changes, and general resources, (b) managing survivor emotions and behaviors, (c) managing medications and personal care, (d) managing finances and transportation, and (e) managing one’s own emotions and health care needs.”¹

“**Support** – engaging in *interactions with peers* for support and advice (e.g., support groups, online discussion forums).”¹
Supplementary Table IV. Summary of survivor and caregiver outcomes.

<table>
<thead>
<tr>
<th>Do family caregiver and dyad interventions improve survivor outcomes?</th>
<th>Do family caregiver and dyad interventions improve caregiver outcomes?</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Survivor physical functioning.</strong>&lt;br&gt;Two dyad studies^8,9^ indicated that activities of daily living (ADL) and instrumental activities of daily living (IADL) were significantly improved for stroke survivors at the end of 12 and 18 months respectively. Another dyad study^11^ reported rapid improvement in functional independence in the first 6 months, with significant improvement in cognitive ability in the intervention group.</td>
<td><strong>Caregiver preparedness.</strong>&lt;br&gt;Compared with standard care, two studies reported significant improvements in caregiver mastery at 1, 3, and 6 months post-stroke.^3,10^ Other studies reported nonsignificant results with respect to problem-solving,^6^ mastery,^6^ and preparedness.^11^</td>
</tr>
<tr>
<td><strong>Survivor anxiety and depression.</strong>&lt;br&gt;One dyad study^9^ found a significant reduction in survivor depression at 12 months compared with usual care, although no improvement in anxiety levels at 6, 12, or 18 months. In another dyad study,^11^ depression in the intervention versus the control group did not achieve significance at 6 or 12 months.</td>
<td><strong>Caregiver anxiety and depressive symptoms.</strong> Compared with a control group or usual care, four studies^2,5,6,9^ showed significant improvements in depressive symptoms at various timepoints, with two studies sustaining these improvements up to a year.^2,6^ One of the studies reported these findings only in a subgroup of caregivers with mild to severe depressive symptoms.^2^ Other studies revealed nonsignificant results with respect to depressive symptoms,^3,7,11^ possibly due to low baseline depressive symptom scores. Only one study^9^ assessed caregiver anxiety, but did not find significant improvements.</td>
</tr>
<tr>
<td><strong>Survivor health-related quality of life.</strong>&lt;br&gt;Two dyad studies measured perceived health using a single item,^8,11^ with one reporting improvement in survivor health within the intervention group over 12 weeks,^8^ and the other showing significant improvement in survivor health compared with a control group at 6 months.^11^ Kim and colleagues^10^ revealed that, compared with a control group at 3 months, there were significant improvements in</td>
<td><strong>Caregiver health-related quality of life.</strong> Several studies showed improvements in caregiver health-related quality of life.^2,6,11^ Unhealthy days,^2^ health status,^11^ and life changes^2^ improved in some studies, with a reduction in physical complaints found in another study.^6^ One study reported no significant group differences for life satisfaction.^9^</td>
</tr>
</tbody>
</table>
health behaviors such as exercise, avoidance of salty foods, and increased fruit and vegetable consumption.\textsuperscript{10}

<table>
<thead>
<tr>
<th>Survivor social functioning.</th>
<th>Caregiver social functioning.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bishop and colleagues\textsuperscript{7} evaluated a telephone intervention with dyads over 6 months. Compared with usual care, stroke survivors exhibited improvement in several aspects of family functioning at either 3 or 6 months, although not all outcomes were significant at all time points. Because of the large number of outcomes, findings were difficult to interpret. Findings do show promise for improving family functioning from the survivor’s perspective.</td>
<td>Several interventions showed improvement in perceptions of family or other social support,\textsuperscript{3,7,11} and increased leisure time during the early recovery period.\textsuperscript{8} One study\textsuperscript{7} reported reductions in caregivers’ critical attitudes and behavior toward the survivor, but not reductions in caregivers’ feelings of receiving criticism. Another study\textsuperscript{11} reported nonsignificant findings regarding various social-relational outcomes, including survivor-caregiver relationship quality.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Survivor service use.</th>
<th>Caregiver knowledge and satisfaction.</th>
</tr>
</thead>
<tbody>
<tr>
<td>One dyad study explored service use (global health utilization, physician visits, therapy hours, rehospitalization) and found no significant group differences at 3 or 6 months.\textsuperscript{7} Interestingly, when caregiver and survivor scores were summed, they did find decreased global health utilization at 3 months; although, individual caregiver utilization scores were not significant.\textsuperscript{7} Another caregiver study found no significant group differences for survivor rehospitalization.\textsuperscript{5}</td>
<td>Chang and colleagues\textsuperscript{8} found significant improvements in caregiver knowledge and satisfaction with services (their primary outcomes) after 12 weeks of receiving the intervention; however, these findings should be interpreted with caution as no comparison group was used.</td>
</tr>
</tbody>
</table>
References


