
The Impact of a Web-Based Caregiver Intervention on the Reasons Stroke Survivors Use Health Care Services During the First Year Post Treatment

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Purpose: A Web-based education/support intervention for caregivers of stroke survivors was developed. A prospective, descriptive design was used to identify caregivers' reported reasons for stroke survivors' health care service use (i.e., health care provider and emergency department visits, hospital readmissions) during the first year after initial treatment. **Method:** Caregivers were recruited in the Midwest and randomized into an experimental (Web users, $n=36$) or control (non-Web users, $n=37$) group. Telephone interviews were conducted with the caregivers every 2 weeks. Reported reasons were organized by group and time period in which the service occurred (i.e., Months 1–6 or 7–12; 1-year totals). Content analysis and descriptive statistics were used to analyze these data. **Results:** Two themes emerged: wellness- and problem-oriented reasons for health care service use. Web users reported a large percentage of visits for rehabilitations reasons, which may have subsequently contributed to the musculoskeletal issues of this group. Laboratory work and testing was considered by both groups as a primary reason for provider visits. Non-Web users reported that medication adjustment was a common reason for provider visits. They also had more emergency department visits and hospital admissions for cardiology or pulmonology reasons. **Conclusion:** This study informs professionals about the care and needs of stroke survivors and provides direction for education and supportive interactions with caregivers and survivors. **Key words:** caregivers, health services, health utilization, stroke, stroke patients

Stroke is the second leading cause of death worldwide and the third leading cause of death in the United States, with 750,000 people in the United States suffering a stroke annually.¹ Almost 5 million Americans are currently living with the lingering effects of stroke.¹ Within 1 year post stroke, up to 80% of stroke survivors are back living in the community, with one third of this population living dependently with an informal caregiver.² The numerous complications and comorbidities associated with stroke make the use of health care services essential for the successful recovery of the stroke survivor, and the decision to seek services is influenced by caregivers. We posed the following research questions: (a) what are the reasons stroke survivors use health care services (i.e., provider and emergency department visits and hospital readmissions) in the first year after initial treatment, and (b) are there differences in the reasons for health care service use during the first 6 months compared to the second 6 months or are there differences if caregivers receive Web-based education and support?

Complications

On average, stroke survivors will experience 3.9 complications after a stroke.³ Complications most commonly reported by stroke survivors are

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depression, urinary tract and other infections, falls, skin breaks, pressure sores, and limb pain.⁴⁻⁷ Depression occurs in 19% to 40% of stroke survivors, with one study reporting up to 60% of them being prescribed antidepressants.⁸ Urinary incontinence is reported to occur in 32% to 79% of stroke survivors.³ Risk factors for complications include age, prestroke disability, and type and severity of stroke.⁴ The severity of the stroke, whether the person is hospitalized for the stroke, and where they lived before the stroke are thought to affect the outcome of the person's recovery as well.⁹ Because most complications hinder the healing and recovery process, it has become increasingly more common for survivors to require medications and the use of rehabilitation strategies to treat these complications.¹⁰ Medical complications associated with stroke are reported to account for 50% of deaths at 3 months post stroke.¹¹

Comorbidities

Diabetes, hypertension, congestive heart failure, coronary artery disease, high cholesterol, and atrial fibrillation are common comorbidities post stroke.^{3,12} With all types of stroke, hypertension is the most common comorbidity.¹³ On average, stroke survivors experience 2.4 comorbidities. This is directly related to the number of medications prescribed, which averages at 11.3 medications from 5.4 different drug classifications per stroke survivor. The most common medications prescribed post stroke include antihypertensives, antiplatelets, antihyperlipidemias, and antidepressant medications.³ Comorbidities have been identified as barriers to recovery and contributors to resultant disability.^{3,12,13}

Resource Use and Interventions

Although the percentage of caregivers under considerable strain in the early poststroke phase has been found to be notable, support services for caregivers are not frequently used.¹⁴ King and Semik found that 57% of caregivers reported unmet needs at least once during the rehabilitation process.¹⁵ Importance ratings for used and unused resources indicated that some, such as respite,

stress management, and talking to peers, were used infrequently, despite "important" ratings by 34% to 74% of nonusers.¹⁵ The most frequently used resources were home health care and spiritual support. Only 40% of caregivers recalled receiving information on stroke prevention, yet 63% of all caregivers rated it important.¹⁵

In a multicenter outreach study where nurses provided support to survivors and their caregivers via three telephone contacts and one home visit within 6 months poststroke, Boter and colleagues found that the number of needs decreased during the consecutive contacts.¹⁶ The most frequent types of interventions employed by these nurses included supportive listening, providing reassurance or encouragement, and giving information.¹⁶ Another intervention study by Patel and associates that trained caregivers in basic nursing and facilitation of personal care techniques during rehabilitation of survivors found that training was associated with fewer losses in quality of life.¹⁷ In addition, although the stroke survivors initially used similar health care services, the survivors of the caregivers in the intervention group stayed in the hospital for a shorter period of time, and required less physiotherapy and occupational therapy, than the survivors of the caregivers in the control group.¹⁷

Web-Based Interventions

The use of the Internet to access medical information has become commonplace. In a study conducted by Kelly, 80% of 10,000 people surveyed used the Internet to find medical information and 40% of those surveyed sought information for others.¹⁸ Web-based education and support are useful because a large number of people can be educated simultaneously and individuals can remain anonymous if they wish, removing the drawbacks of traditional support groups.¹⁹ Education, support, and care can be promoted without losing the human interaction by offering Web-based services to caregivers and stroke survivors.²⁰

The use of Web-based interventions for caregivers is being explored in the treatment of stroke. Two examples are noteworthy. Fox, through a National Institute of Neurological Disorders and Stroke grant (2005–2010), is

developing a Web-based interactive video program to improve the education of stroke survivors and their caregivers while in rehabilitation and after in order to “identify personal risk factors, modify behavior, and ultimately reduce the occurrence of repeat strokes and reduction of overall stroke-related morbidity.”²¹ Pierce, Steiner, and colleagues built Caring~Web®, an in-home, Web-based intervention of support and education, for caregivers managing the needs of stroke survivors.^{22,23} This intervention’s components include the following: (a) Ask the Nurse, an e-mail service where caregivers can ask confidential questions of a nurse specialist; (b) Caretalk, a support group via e-mail where caregivers can discuss areas of interest with and receive help from other caregivers and the nurse; (c) Tip of the Month, customized information and tips specific to caregivers’ needs; and (d) Educational Links, educational information related to stroke and caring from reliable, linked Web sites.²² Caring~Web was used and evaluated to determine its effect on caregivers for 3 months and was found to be a viable mechanism for support and education for these caregiver in home settings.^{24,25}

Method

Design

A prospective, descriptive design was used in the current study to examine caregivers’ reported reasons for health care service use by stroke survivors during the first year after initial treatment. This study provides a description of why the survivors sought health care services. Health care service use and the number of visits to a provider, an emergency department, or a hospital will be reported elsewhere. The study was a secondary analysis of data from a National Institutes of Health project (parent study) that examined the effect of Caring~Web for 1 year.²⁶ The caregivers in the parent study were recruited ($n=73$) with institutional review board approval from rehabilitation centers in northern Ohio and southern Michigan from May 2002 through December 2004 and were followed for 1 year. Inclusion criteria were based on the stroke survivor being discharged to home with a caregiver after

initial stroke treatment, although the caregiver did not necessarily have to be present in the home. In addition, the caregiver had to be able to read, write, and understand English. The caregivers were randomized to an experimental group that received the Caring~Web intervention (Web users) or a control group (non-Web users) that received standard care.

Data collection

Data were collected from the caregivers every 2 weeks by trained telephone interviewers. They were asked reasons why the stroke survivors visited a health care provider and/or a hospital emergency department and/or why they stayed overnight in the hospital. Although it is not known whether the caregivers were responsible for decisions about health care utilization, they were the focus of the intervention for the parent study and consequently of the interviews. The questions asked were adapted from the 1999 National Health Interview Survey (NHIS) of the civilian noninstitutionalized population living in the United States.²⁷ The data from the NHIS have been collected continuously in a nationwide survey by household interview since 1957.²⁸ Each reason for use was counted, even if it occurred repeatedly for the same subject. For example, the stroke survivor went multiple times to the doctor for diabetes management.

Data analysis

Information obtained during the interviews was immediately entered into Web-based forms designed for the parent study. The data sets were downloaded for this study into the spreadsheet application Microsoft Excel. Descriptive statistics were computed to describe the sample. Responses to the questions on the reasons for health care service use were examined using Norwood’s rigorous process of content analysis.²⁹ Initial code categories were identified and determined through consensus by the first two authors, who have doctoral education in qualitative research methods. These categories were then confirmed by three research students who subsequently applied the coding scheme to the data. Any ambiguity was discussed with the investigators.

Data were organized by type of health care service and separated into three time periods: Months 1–6, 7–12, and 1-year totals. These periods were based on research that found health care service use to be highest in the first 6 months post stroke and leveling off over time. Descriptive statistics were used to determine category frequencies or percentages based on the number of reasons for that time period for each group (Web users vs. non-Web users). Percentages are useful to express one value relative to another value. For each type of health care service use, categories of reasons were compared between the two groups and among the three time periods.

Results

Sample

Seventy-three caregivers comprised the sample of 37 non-Web users and 36 Web users (**Table 1**). The majority of the subjects in both groups were women (non-Web users=81%; Web users=69%). The mean age of the non-Web users was 55 years and 54 years for the Web users. Most of the subjects were wives of the stroke survivor (non-Web users=51%; Web users=42%) and White, not of Hispanic origin (non-Web users=84%; Web users=86%). The majority of subjects had at least a high school education (non-Web users=97%;

Table 1. Demographic profile of caregivers of stroke survivors ($n=73$)

Characteristics	Non-Web user group ($n=37$)		Web user group ($n=36$)	
	<i>n</i>	%	<i>n</i>	%
Gender				
Male	7	18.9	11	30.6
Female	30	81.1	25	69.4
Age (in years)				
20–30	2	5.4	0	0
31–40	3	8.1	6	16.7
41–50	8	21.6	6	16.7
51–60	12	32.4	11	30.6
61–70	7	18.9	8	22.2
71–80	5	13.5	5	13.9
Relationship				
Wife	19	51.4	15	41.7
Husband	7	18.9	9	25.0
Daughter	7	18.9	6	16.7
Son	0	0	1	2.8
Other relatives/friends	4	10.8	5	13.8
Ethnicity				
American Indian or Alaskan Native	1	2.7	0	0
Asian/Pacific Islander	0	0	0	0
Black not of Hispanic origin	5	13.5	4	11.1
Hispanic	0	0	1	2.8
White not of Hispanic origin	31	83.8	31	86.1
Education (in years)				
None	0	0	1	2.8
Grade school (1–8)	1	2.7	4	11.1
High school (>8–12)	19	51.4	10	27.8
College (>12–16)	15	40.5	15	41.7
Graduate school (>16)	2	5.4	6	16.7
Employment				
Full-time	15	40.5	12	33.3
Part-time	4	10.8	8	22.2
None	18	48.6	16	44.4

Web users=86%). The mean number of years of schooling for the non-Web users was 13 and was 14 for the Web users. Most subjects were employed at least part-time (non-Web users=51%; Web users=56%).

Of the stroke survivors (see **Table 2**), most were men (non-Web users=60%; Web users=56%). The mean age of the survivors in both the non-Web and Web user groups was 63 years. The majority were White, not of Hispanic origin (non-Web users=84%; Web users=86%).

Reasons

Two themes emerged from the data collected. The reasons reported were either wellness-oriented or problem-oriented for both the non-Web and Web user groups. These data are summarized in **Tables 3, 4, 5, and 6**.

Wellness-oriented reasons

The wellness-oriented theme with its specific reason categories was based on the type of health care provider/specialty that was seen by the stroke survivor (see **Table 3**). Often caregivers did not give a specific reason and only stated who they visited.

For example, primary care included visits to a primary care provider and neurology included visits to a neurologist. Unspecified follow-up reasons included visits where a provider was not designated. For instance, when a caregiver responded “just a routine visit” or “we had a follow-up appointment,” the reason was coded as an unspecified follow-up. The other specialty follow-up category included visits to a podiatrist, dermatologist, endocrinologist, homeopathic provider, oncologist, and/or radiologist, which were grouped together as these were uncommon occurrences. Routine laboratory blood work included international normalized ratios (INR) for monitoring warfarin therapy, levels of valproic acid for treating mood disorders, and/or blood draws not related to an acute problem.

As displayed in **Table 3**, both the non-Web user and Web user groups reported unspecified follow-up and primary care as principal reasons for wellness provider visits in Months 1–6. The Web user group also reported rehabilitation as a primary reason for visits in Months 1–6. Unspecified follow-up and primary care continued to be the two reasons reported most often by both groups for Months 7–12. However, rehabilitation was no longer reported as a primary reason for wellness provider visits for the Web user group during this time period.

Table 2. Demographic profile of stroke survivors ($n=73$)

Characteristic	Non-Web user group ($n=37$)		Web user group ($n=36$)	
	<i>n</i>	%	<i>n</i>	%
Gender				
Male	22	59.5	20	55.6
Female	15	40.5	16	44.4
Age (in years)				
20–30	0	0	0	0
31–40	3	8.1	2	5.6
41–50	3	8.1	6	16.7
51–60	9	24.3	8	22.2
61–70	8	21.6	6	16.7
71–80	12	32.4	10	27.8
81–90	2	5.4	4	11.1
Ethnicity				
American or Alaskan Native	1	2.7	0	0
Asian/Pacific islander	0	0	0	0
Black not of Hispanic origin	5	13.5	4	11.1
Hispanic	0	0	0	0
White not of Hispanic origin	31	83.8	31	86.1
Other	0	0	1	2.8

Table 3. Percentages of wellness-oriented reasons for health care provider visits

Reasons for wellness provider visits	Non-Web user group (n=37)			Web user group (n=36)		
	Months 1–6	Months 7–12	1-year totals	Months 1–6	Months 7–12	1-year totals
Unspecified follow-up	24.5	23.2	24.0	20.2	20.4	20.3
Primary care	22.3	24.8	23.1	23.8	34.0	27.4
Neurology	11.4	8.0	10.1	16.1	10.7	14.2
Vision/dental	10.5	10.4	10.4	4.1	2.9	3.7
Cardiology/pulmonology	8.6	7.2	8.1	5.7	6.8	6.8
Orthopedic/chiropractic	6.4	4.0	5.5	1.0	3.9	2.0
Other specialty follow-up	5.5	4.8	5.2	4.1	3.9	4.1
Rehabilitation	5.9	4.0	5.2	20.2	6.8	15.5
Routine laboratory work	5.0	10.4	6.9	2.6	6.8	4.1
Urology/nephrology	—	3.2	1.2	2.1	3.9	2.7

Note: Percentages are based on the number of reasons for that time period for each group.

When comparing the two groups over the entire 1-year period, the two most reported reasons are the same, unspecified follow-up and primary care. Differences between the groups emerged in the third most frequently reported reason. The non-Web user group reported vision/dental followed closely by neurology (only 0.3% difference), while rehabilitation was a chief reason reported for wellness provider visits by the Web user group during the entire 1-year study.

Problem-oriented reasons

The problem-oriented theme with its specific reason categories was based on symptoms reported by the caregiver that required health care intervention for the stroke survivor. Examples of how symptoms were categorized include the following: (a) shortness of breath was considered a cardiology/pulmonology reason; (b) nausea/vomiting and diarrhea, as well as low blood sugars, were gastrointestinal/metabolic reasons; (c) back or arm pain was considered a musculoskeletal reason; (d) reports of urinary tract infections or an infected toe were considered infection reasons; and (e) kidney stones or blood in the urine were considered urology/nephrology reasons. Laboratory work and testing included a variety of blood tests for acute disease conditions, as well as appointments for an echocardiogram, stress test, or magnetic resonance imaging (MRI). Surgical reasons included procedures such as feeding tube placement or removal, cardiac catheterization, hip

surgery, and surgical follow-up. The other specialty category included visits for specialized care such as a broken denture bridge, foot problems, or hearing loss. Vague symptoms such as “felt ill” or “not feeling well” were placed into the other category along with symptoms that were not specific such as a rash, an allergic reaction, and eye twitching. Problem-oriented reasons were divided into the three types of health care services including provider visits, emergency department visits, and hospital readmissions.

As seen in **Table 4**, provider visits for laboratory work/testing and surgical reasons were most frequently reported by the non-Web user group in Months 1–6. Laboratory work/testing was the primary reason reported for this time period for the Web user group as well. However, provider visits for musculoskeletal reasons were the second most commonly reported reason for the Web users. In Months 7–12, medication adjustment became the primary reason for provider visits, followed by surgical reasons for the non-Web user group. Laboratory work/testing continued to be the most reported reason for the Web user group for Months 7–12; however, urology/nephrology became the second most often reported reason for provider visits.

Over the 1-year period of the study, laboratory work/testing was the primary reason for provider visits for both non-Web and Web user groups. Surgical was the second most reported reason for the non-Web user group compared to

Table 4. Percentages of problem-oriented reasons for health care provider visits

Reasons for provider visits	Non-Web user group (n=37)			Web user group (n=36)		
	Months 1–6	Months 7–12	1-year totals	Months 1–6	Months 7–12	1-year totals
Laboratory work/testing	19.8	7.6	14.7	16.5	17.5	17.0
Surgical	10.3	9.8	10.1	7.3	8.8	8.1
Cardiology/pulmonary	5.6	6.5	6.0	8.3	6.1	7.2
Gastrointestinal/metabolic	4.0	1.1	2.8	2.7	1.7	2.2
Musculoskeletal	5.5	8.7	6.9	13.8	6.1	9.9
Infection	4.0	3.3	3.7	3.6	3.5	3.6
Urology/nephrology	2.4	3.3	2.8	4.6	11.4	8.1
Injury	1.6	2.2	1.8	1.8	2.6	2.2
Medication adjustment	4.8	10.9	7.3	1.8	2.6	2.2
Other specialty	1.6	6.5	3.7	9.2	5.3	7.2
Neurology	3.2	3.3	3.2	4.6	8.8	6.7
Psychology	1.6	2.2	1.8	0.9	2.6	1.8
Other	4.8	1.1	3.2	6.4	4.4	5.4

Note: Percentages are based on the number of reasons for that time period for each group.

musculoskeletal for the Web user group. The least reported reason for provider visits for this time period for both groups was psychology.

Emergency department visits in Months 1–6 were primarily for cardiology/pulmonology reasons for the non-Web user group compared to musculoskeletal reasons for the Web user group (see **Table 5**). In Months 7–12, both groups reported neurology as the principal reason. When comparing the groups over the entire 1-year time period, neurology was the main reason for both groups for visiting an emergency department.

Table 6 shows that *hospital readmissions* for the non-Web user group were most often reported for cardiology/pulmonology reasons during Months 1–6 as compared to surgical reasons for the Web user group. During Months 7–12 cardiology/pulmonology reasons continued to be the principal reason for hospital readmissions for the non-Web user group, but neurology became the chief reason for the Web user group. Comparing the groups over the 1-year time period showed that cardiology/pulmonology was consistently the main reason for hospital readmissions for the non-Web user group, while surgery was the primary reason for the Web user group.

Discussion

Unspecified follow-up and primary care were consistently reported as the two principal reasons for wellness provider visits for both the non-Web and Web user groups. However, rehabilitation emerged as a primary reason for visits in the Web user group only. This finding could be attributed to the Caring~Web intervention that offered peer support, professional advice, and information 24 hours a day to the Web user group.²⁴ Participants who might have given up on rehabilitation due to lack of progress or who were finding rehabilitation physically or emotionally draining may have been encouraged to continue therapy by the Web-based support group. The nurse specialist may also have encouraged continued rehabilitation therapy because of symptoms reported by the caregiver and as a way to prevent further complications or to promote the physical health of the stroke survivor. Unfortunately, continued rehabilitation may have also contributed to the musculoskeletal issues of the Web user group, which was their primary reason for emergency department visits.

Although a health care provider may not have been present, laboratory work/testing was

Table 5. Percentages of problem-oriented reasons for emergency department (ED) visits

Reasons for ED visits	Non-Web user group (n = 37)			Web user group (n = 36)		
	Months 1–6	Months 7–12	1-year totals	Months 1–6	Months 7–12	1-year totals
Laboratory work/testing	—	1.1	0.5	0.9	—	0.4
Surgical	—	—	—	—	—	—
Cardiology/pulmonology	4.0	3.3	3.7	0.9	—	0.4
Gastrointestinal/metabolic	2.4	1.1	1.8	2.8	0.9	1.8
Musculoskeletal	—	—	—	4.6	—	2.2
Infection	—	1.1	0.5	—	2.6	1.3
Urology/nephrology	0.8	2.2	1.4	—	2.6	1.3
Injury	2.4	3.3	2.8	—	2.6	1.3
Medication adjustment	—	—	—	—	—	—
Other specialty	—	—	—	—	—	—
Neurology	3.2	5.4	4.1	1.8	5.3	3.6
Psychology	—	—	—	—	—	—
Other	1.6	1.1	1.4	0.9	—	0.4

Note: Percentages are based on the number of reasons for that time period for each group.

Table 6. Percentages of problem-oriented reasons for hospital readmissions

Reasons for hospital readmissions	Non-Web user group (n = 37)			Web user group (n = 36)		
	Months 1–6	Months 7–12	1-year totals	Months 1–6	Months 7–12	1-year totals
Laboratory work/testing	—	—	—	—	—	—
Surgical	2.4	1.1	1.8	2.8	0.9	1.8
Cardiology/pulmonology	4.8	7.6	6.0	—	0.9	0.4
Gastrointestinal/metabolic	0.8	—	0.5	—	—	—
Musculoskeletal	—	—	—	0.9	—	0.4
Infection	0.8	—	0.5	—	—	—
Urology/nephrology	0.8	1.1	0.9	0.9	0.9	0.9
Injury	3.2	—	1.8	—	—	—
Medication adjustment	0.8	—	0.5	—	—	—
Other specialty	—	—	—	—	—	—
Neurology	2.4	5.4	3.7	0.9	1.7	1.3
Psychology	—	—	—	—	—	—
Other	0.8	—	0.5	0.9	—	0.4

Note: Percentages are based on the number of reasons for that time period for each group.

considered by both groups as a primary reason for problem-oriented provider visits. Any time the stroke survivor left the house for a medical reason, caregivers reported it, even if it was for a laboratory blood draw or an X-ray. The non-Web user group also reported that medication adjustment was a

common reason for problem-oriented provider visits. This could be due to the fact that these caregivers did not have access to the information or advice provided by the Caring~Web intervention.

The non-Web user group had more emergency department visits and hospital readmissions

for cardiology/pulmonology reasons than the Web user group. Less rehabilitation therapy or physical activity by the stroke survivor could have contributed to these conditions. Conversely, the Web user group had the availability of professional advice from the nurse in regard to signs and symptoms of cardiac/pulmonary problems in the stroke survivor, and perhaps the nurse was able to assist the caregivers before there was a crisis situation that required going to the hospital.²⁴

Psychological problems have been identified as a common complication after stroke.⁴⁻⁸ The current data, however, did not support this finding and psychological reasons did not emerge as a reason for health care service use by the stroke survivors. Although caregivers in this study may not have identified problems or symptoms such as depression, stress, or anxiety as primary reasons for seeking services, these conditions may still have been addressed during the visit. Caregivers may also have been reluctant to mention psychological problems due to the social stigma surrounding the topic.

Other than psychological problems, reasons for health care service use stated by the caregivers in this study are comparable to the leading poststroke medical complications described in the literature, such as urinary tract and other infections, falls, skin breaks, pressure sores, and limb pain,⁴⁻⁷ as well as the poststroke comorbidities, such as diabetes, hypertension, congestive heart failure, coronary artery disease, high cholesterol, and atrial fibrillation.^{3,12} The caregivers described the reasons as symptoms, however, and not specific medical complications or comorbidities. Based on the caregivers' responses, it appeared that they often did not have a clear understanding of what was causing the symptoms or led to the use of health care services. Their responses confirmed the assumption that people return to the doctor or take a medication "because the doctor said to." Analyzing reasons for health care service use from the caregivers' perspective promotes better education by health care professionals, focusing on helping people understand what is actually causing certain symptoms that lead to health care service use.

Limitations

Three primary limitations of this study were identified. First, although no medical advice was

given, the interview questions asked of both groups may have encouraged the caregiver to be more cognizant of the care needs of the stroke survivor and the use of health care services. Another potential limitation was the ability of the caregivers to remember and report with accuracy the health care services used by the stroke survivors. Interviews were conducted every 2 weeks to help the caregivers remember significant events, however, there is no guarantee that this happened. Finally, during the interview, the response from the caregiver was not expanded on by the interviewer. The caregiver's response was simply recorded, often leading to vague information about health care service use.

Impact for nursing

Nurses need to have a comprehensive knowledge base regarding the reasons first-time stroke survivors use health care services to promote their health and functioning. Nurses have the responsibility to (a) become familiar with the reasons why stroke survivors use health care services, (b) help stroke survivors and their caregivers become more aware of the development of poststroke complications and comorbidities to prevent the development of irreversible disability or loss of function, and (c) be able to provide clear and comprehensive education to both survivors and their caregivers. Poststroke complications and comorbidities that cause return visits to a health care provider may be preventable or at least controllable. Through proactive education, nurses can foster earlier recognition of potential poststroke complications and comorbidities by stroke survivors and their families.

Nurses not only have the responsibility to be knowledgeable about the reasons why stroke survivors use health care services but also to educate them and their caregivers thoroughly about anticipated treatments, medications, and comorbidities. Increasing the knowledge about reasons stroke survivors use health care services during the first year post stroke can help develop and guide an appropriate and effective educational program for stroke survivors and their caregivers. Identifying the primary reasons for health care service use during different time periods also allows for more focused education and intervention.

Educational information can be offered by nurses during the continuum of care in hospital, inpatient rehabilitation, and outpatient settings. Community services such as support groups, church-sponsored health clinics or informational meetings, or toll-free health information lines can also provide opportunities to educate and intervene. Insurance companies can educate their subscribers by targeting individuals with particular diagnoses. Interventions and education can also be provided in person or on the Internet, such as Caring~Web (<http://caringweb.utoledo.edu>). Information should be made available about reputable Web sites that provide timely and reliable professional advice and/or support to stroke survivors or caregivers in their homes.

Conclusion

Stroke survivors are a vulnerable population faced with many health deficits, including lack of support services and adequate follow-up upon

discharge home.^{4,5,11} They have a higher probability of suffering a large spectrum of comorbidities, leading to health care provider visits, emergency department visits, or hospital readmissions after discharge home from the hospital or rehabilitation facility.⁵ The examination of reasons why persons with a first-time stroke use health care services following discharge can help increase awareness of the educational needs of both stroke survivors and their caregivers. Better identification of the reasons health care services are used can help lead to more comprehensive and targeted hospital discharge teaching and follow-up education when interacting with these individuals.

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