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An E-rehabilitation Team Helps Caregivers Deal with Stroke

Lisa Keaton, MSW, LSW
Geriatric Social Worker
Medical College of Ohio
The Center for Successful Aging
Toledo, Ohio

Victoria Steiner, PhD
Assistant Professor
Department of Medicine
Medical College of Ohio
Toledo, Ohio

Michelle Masterson, PhD, PT
Assistant Professor
Medical College of Ohio
School of Allied Health
Department of Physical Therapy
Toledo, Ohio

Julie L. Smith, MS, RD, LD, CDE
Clinical Dietician
Firelands Regional Medical Center
Sandusky, Ohio

Linda L. Pierce, PhD, RN, CNS, CRRN, FAHA
Professor
Medical College of Ohio
School of Nursing
Toledo, Ohio

Karen Lance MS, CCC-SLP
Director
Rehabilitation Services
Medical College of Ohio
Toledo, Ohio

Martin S. Rice, Ph.D., OTR/L
Associate Professor
Medical College of Ohio
School of Allied Health
Department of Occupational Therapy
Toledo, Ohio

Correspondence and requests for reprints should be directed to:

Lisa Keaton, MSW, LSW

3015 Arlington Ave.

Medical College of Ohio

The Center for Successful Aging

Toledo, Ohio 43614

lkeaton@mco.edu

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Abstract

Objective: The purpose of this report is to present the findings from a secondary analysis of email questions from adult caregivers of persons with stroke directed to a nurse specialist and members of an electronic (E)-rehabilitation team. This analysis explored what caregivers new to the role asked in dealing with the outcomes of stroke.

Materials and Method: Thirteen caregivers submitted questions and had them answered through use of Caring~Web[®], a web-based intervention for caregivers of persons with stroke. Data were gleaned from email messages on Ask-the-Nurse, a one-on-one discussion with the nurse specialist, and Caretalk, an email discussion with the entire group. These data constituted the content for the qualitative analyses. *QSR N 5*, previously known as *NUD*IST*, was the qualitative data management program used to enter, track, explore, code and search all narrative data.

Results: The caregivers' questions centered on: 1) medication management (19%), 2) community and government services (23%), and 3) stroke and related issues in dealing with stroke (58%). These findings, using Friedemann's *framework of systemic organization* as a guide, indicated that the caregivers were seeking new knowledge [individuation in Friedemann's terms] along with supporting one another [coherence], as they sought to maintain themselves and their care recipients [system maintenance].

Conclusion: These are important topics for which information was needed as caregivers sought to maintain themselves and their care recipients in the home.

Key words and terms: Internet, rehabilitation team, CVA, caregivers, support, education

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Introduction

Adult caregivers for persons with stroke often find themselves in the role of caregiving without any prior experience or training. As with any new role, success depends upon having access to education on a continuing and as needed basis. However, once the care recipient is released from inpatient care, educational information is often difficult to find and caregivers must actively seek it out.

The Adult Learner

Knowles emphasized that adults are self-directed and expected to take responsibility for their decisions.¹ Adult learning programs for caregivers must accommodate these concepts. Since adults are self-directed, instruction needs to allow learners to discover for themselves and provide guidance and help when mistakes are made.²

According to Knowles, using the past experiences of adult learners, which provides a large part of their self-identity, is of great importance as a rich resource for learning. If in an educational situation an adult's experience is ignored and not valued, it is not just the experience that is being rejected but also the person.¹ Therefore, adults need to learn experientially and discussion groups may be a technique used to help promote this type of learning.² Secondly, adults become ready to learn when they experience a need to know or a need to do something in order to perform more effectively in some aspect of their lives. Adults are motivated to learn after they experience a need in their life situation, and they enter an educational activity with a life-centered, task-centered, or problem-centered orientation to learning. Lastly, adults are more interested in learning material that is immediately useful and relevant in their personal life.¹ Web-based instruction for adults can easily incorporate these concepts.

Web-based Education

Health care consumers have used the Internet in search of information on diagnoses and treatments for a variety of acute and chronic conditions. A recent analysis from Manhattan Research revealed almost 10 million adults report receiving recommendations to visit web-based health sites directly from their personal physician.³ In addition, in the case of chronic health conditions, it has often been the caregivers who have accessed web sites in search of information on caregiving.⁴

Applications of Web-based Education

The following examples are related to caregivers and web-based instruction. For adult caregivers of persons with cancer, there are several web-based options for education that serve as examples. Reis, McGinty, and Jones described a theoretically defined multimedia caregiving training program for prostate cancer that is intended to assist in triaging the needs of the care recipient and to enhance self efficacy with caregiving tasks through utilizing both web-based resources and a CD-ROM. Although this program was not complete and ready for distribution, feedback from 45 prostate patients and families on perceived needs for caregiver training underscored the potential value of a computer supported intervention.⁵ This program, however, only allowed for interaction with software and not with a “live” web-based education and support network.

Monnier, Laken, and Carter discussed a feasibility study in which implementation of web-based resources were used in conjunction with the personal services obtained from a cancer treatment team. The authors found that 319 caregivers and care recipients wanted access to and would likely use web-based services, not only for information about the disease process and treatment options, but also to interact with physicians, nurses, and online support groups.⁶

The treatment of cardiac conditions using web-based interventions is also noted in the literature. Brennan et al. described a web-based information and support service, called HeartCare.⁷ HeartCare provides an “extension and enhancement of traditional nursing services, including patient centered, individualized, and time-relevant information as well as both peer and professional support to patients recovering from [coronary artery bypass graft surgery] CABG in their homes”(p. 702).⁷ The educational information available allowed 140 individuals to access information related to their stage of recovery. They also posted and responded to online messages for peer support and communicated with a nurse, who had extensive cardiac recovery experience, by e-mail. Preliminary indications of patients’ use and acceptability of the system during their recovery were promising.⁷

Alexy reported the use of web-based resources for the homebound elderly and their informal caregivers was a way to promote social support and mental health.⁸ These individuals benefit from online resources by gaining valuable information, confidence, and support. The concern presented by Alexy was that older adults and their caregivers, as well as professional caregivers, might not have the ability to discern reliable from unreliable web-based information.⁸

The purpose of this paper is to present the findings of a secondary analysis of email questions from adult caregivers of persons with stroke directed to a nurse specialist and members of an electronic (E)-rehabilitation team. The analysis explored what these caregivers, who were new to the role of care-giving, asked in dealing with the outcomes of stroke. The paper also describes the process of using an E-rehabilitation team for web-based education.

Materials and Methods

The investigators, Steiner and Pierce, in collaboration with experts from the Center for Creative Instruction at a medical college in northwest Ohio, have developed a web site for caregivers of persons with stroke, Caring~Web[®].² The investigators have years of experience in developing in-person education and support systems for caregivers, as well as experience with web-based teaching. Web pages for Caring~Web[®] were designed that are easy to use by adult, computer novices including older individuals. Caregivers in the present study asked questions and had them answered through use of Caring~Web[®].

Caring~Web[®]

Once caregivers have gained access to Caring~Web[®], they can link to and/or participate in its components.² The Caring~Web[®] intervention contains multiple components to provide different types of education and support to assist as many caregivers as possible who have potentially diverse characteristics and needs. The site contains a disclaimer stating that the medical information presented on the web site is meant for general education purposes only. Users are encouraged to contact their healthcare provider for specific medical concerns or treatment. The web site has been evaluated by 35 adults who are novice computer users.¹⁰ These adults ranged in age from 26 – 80 years with an average age of 59 years. They rated the web site high in design and content, and found it easy to navigate and understand.¹⁰

Educational Information. One way educational information is provided to caregivers is in the form of a Tip-of-the-Month, on topics such as preventing aspiration and communication problems. Tips are designed to be easy to understand and to encourage online discussion between caregivers and the nurse specialist. Educational information on a variety of stroke-related issues for persons with stroke and families/caregivers is also available on Caring~Web[®] via links to reputable web sites (i.e., American Stroke Association and National Stroke Association).

Ask-the-Nurse. Caregivers are encouraged to e-mail any question(s) related to their caring experience that they may have to the nurse specialist, backed-up by an E-rehabilitation team of experts, using the Ask-the-Nurse link at any time during the day or night (24-hours per day). The nurse specialist has extensive expertise in homecare and rehabilitation settings in maintaining individuals and families in their homes. She is an expert in dealing with caregivers' and family's issues and concerns regarding rehabilitation and recovery from stroke. For this project, the nurse specialist answers the caregivers' questions via electronic mail (or telephone if she feels it is necessary or an emergency) within 24-hours of receiving the message(s).¹¹

Caretalk. An electronic mailing list or discussion group was also set up for caregivers to talk to one another and the nurse specialist about their caring experiences. The mailing list, Caretalk, enables caregivers to send electronic mail messages to all participants at once instead of just one individual. Caregivers do not have to join or subscribe to the group like other mailing lists, but are automatically put on the

mailing list when they consent to be in the research study. If they are comfortable, caregivers are encouraged to ask questions of the nurse specialist on Caretalk so that all the participants may benefit from the discussion.

There is also a complete E-rehabilitation team of professionals available to assist the nurse specialist in responding to complex or discipline specific questions on both Ask-the-Nurse and Caretalk. This team includes a physician, social worker, physical therapist, occupational therapist, speech therapist, pharmacist, and dietitian.

Use of the E-rehabilitation team. A protocol was developed by the second two authors to deal with questions posed by the caregivers. When the nurse specialist receives a complex email question, she consults the appropriate member(s) of the E-rehabilitation team via email. E-rehabilitation team members respond to questions from the nurse specialist within 24 hours. Answers submitted by the team members are formatted in a general way and telephone consultation between the nurse specialist and team member may occur for a more complete answer. The nurse specialist also telephones the E-rehabilitation team member for his/her answer to the posed question if she does not receive an email response within 24 hours. E-rehabilitation team members do not have direct contact with the caregivers, but their answers to questions are compiled by the nurse specialist into easy to understand messages and emailed to the caregivers. These team members notify the nurse specialist if they are going to be out of town for more than one day, and provide the name and email address of a professional colleague whom could serve as a backup support person.

In addition, the nurse specialist emails the E-rehabilitation team members examples of submitted caregivers' questions every six months, as well as the current number of online participants in the study. E-rehabilitation team members attend bi-yearly research team meetings to learn about the progress of the project, discuss cases, and ask questions or relay concerns. E-rehabilitation team members have also submitted interesting, up-to-date educational information in a Tip-of-the-Month format to the investigators for posting on the Caring~Web[®] site.

Data Collection

Data were gleaned from email questions that caregivers asked of the nurse specialist and E-rehabilitation team on Ask-the-Nurse and Caretalk. The answers that were provided by the nurse specialist and team were also analyzed. These data constituted the content for the qualitative analyses.

In addition, a lot of information was provided to caregivers without them asking for it. The present study did not examine free flowing discussion or caregivers' responses to posed questions and posted news items related to stroke from the nurse specialist (over 10,000 total data entries). *QSR N 5*, previously known as *NUD*IST*, was the qualitative data management program used to enter, track, explore, code, and search the narrative data.¹²

Analysis of Data

A preliminary coding rubric for the qualitative data was established in previous pilot work by the second two authors in collaboration with a larger research team based on the *framework of systematic organization* by Friedemann^{13,14} and reviewed by the theorist for congruence with the tenets of the theory.¹⁵ The first three authors conducted data review and analysis of exemplars for this current project. Using the coding rubric, and with E-rehabilitation team members discussion and consensus, individual codes for the data presented in this report were grouped along Friedemann's theory domains of individuation, system maintenance, and coherence. Individuation is the promotion of individual learning and changing attitudes, taking in and incorporating information, and sharing opinions and beliefs. System maintenance refers to behaviors that are grounded in tradition, concerns the structure and process of the individual and family, and pertains to organizing and operating the person's business. System maintenance comprises roles, rules, organizational patterns, rituals, decision-making, and power structure. Coherence refers to emotional bonding and caring relationships among individuals.^{13,14} This triangular data analysis process also served as a reliability check of the coding as being reflective of the study data, caregivers' experience, and the theoretical framework. Transferability of these findings must be reassessed in each case in which transfer is proposed. While the authors cannot know all the contexts to which another person may wish to transfer working hypotheses or questions, relevant descriptors of the design and data are included. It is not known if these descriptions provide a sufficient base to permit another to make the needed comparisons of similarity and to enable others interested in making a transfer to reach a conclusion about whether a transfer is possible.

Results

Caregiver Sample

Thirteen caregivers submitted questions to Ask-the-Nurse or the Caretalk discussion group during the first year (May 1, 2002 to April 30, 2003) of a three-year National Institutes of Health study and were included in the present data analyses. However, due to the rolling enrollment used for this study, most of these caregivers had not participated in the study for a year. These adult caregivers of persons with first-time stroke living in metropolitan areas of northwest Ohio and southeast Michigan were recruited from rehabilitation centers and enrolled in the study when their care recipients were discharged home. All individuals were new to the role of caring and dealing with the outcomes of stroke. They were responsible for providing the day-to-day care and/or resources required by the person with stroke and lived in the same home environment as the care recipient or close by.

The sample consisted of six men (four husbands, one son, and one friend) and seven women (five wives, two daughters). All of the caregivers stated that they were white. They were between 31 and 77 years of age. Two of the caregivers were working full-time, three were working part-time, and eight were not working at the time of the study. The number of years of school completed ranged from 10 to 17.

All caregivers were able to read, write, and understand English and had a telephone and/or television to facilitate MSN[®] TV and Internet access. MSN[®] TV is a low cost equipment system of approximately \$100 plus a monthly service fee of about \$25.00 that was paid by the investigators. Four caregivers used their own computer, but they had limited Internet experience. A computer technician installed the MSN[®] TV equipment and provided training for all caregivers. The computer technician was available to the caregivers by telephone during the day for trouble shooting technical difficulties.

The care recipients consisted of six men (five husbands and one father) and seven women (four wives, two mothers, and one friend). Eleven of the care recipients were white, one was African American, and one caregiver answered unknown/other when asked about the care recipient's ethnicity. They were between 33 and 83 years of age. Five of the care recipients had their right side affected by the stroke, seven of them had their left side affected by the stroke, and one caregiver was unsure. Based on a measure of functional independence (FIM) that measures disability or assessment of progress¹⁶, six care recipients were considered low and seven were considered high in motor and cognitive functioning.

The Questions

The caregivers asked a total of 31 questions. These questions were discussed in 157 email data entries (i.e. an average of 5 emails messages between the nurse specialist and caregiver per question). The 6 men asked a total of 15 questions and the 7 women asked a total of 16 questions. These questions centered on how to maintain themselves and care for their care recipients in their homes (system maintenance in Friedemann's^{13,14} terms). The caregivers were also seeking new knowledge (individuation) related to dealing with stroke and its consequences. Caregivers learn by giving care, exploring facts about stroke, or interacting with their family and health care experts.^{13,14} There were 6 questions about medication management (19%), 7 questions centered on available community and government services (23%), and 18 questions focused on stroke and related issues in dealing with stroke (58%). Interwoven throughout the discussion entries were messages of support and encouragement for one another (coherence). Coherence can be achieved by a caregiver through a variety of actions leading to renewed energy and a positive attitude.^{13,14}

Although the caregiver's names are pseudonyms, the following quotes are the caregiver's own words and stories taken from email postings. In welcoming a new caregiver to the group, Mary said,

Ann, welcome aboard this wonderful outlet. I have found this to be a great escape. You can get great advice, wisdom, and real answers to all your questions.... You might not get all the answers here, but we are ready to help, plus we have our nurse.

Medication management. These questions were related to the use of drugs by the caregiver and their care recipient, such as stool softeners, sleeping pills, and blood thinning medications. For example, Norm queried,

Since my wife's stroke, I've noticed contusions on the tops of her hands as if blood vessels have ruptured. She has not been doing anything with her hands to warrant this condition. She is diabetic and takes insulin in A.M. and in the P.M. She is also taking Plavix 75 mg/day and Pletal 50 mg twice a day. I mention these two medications because the pharmacist questioned the use of both at the same time. She has an appointment with her family doctor in a week. Should I mention this to the doctor? Are these drugs blood thinners? Thanks for any information that you can relate to me.

The nurse specialist replied,

I would call her doctor and tell him/her what you have described to me about the contusions on the tops of Nancy's hands. With the two medications, any type of bleeding or contusions would be important to report to Nancy's doctor, as he/she is familiar with her health history.

Descriptions of these drugs ('CLOPIDOGREL/Plavix® and 'CILOSTAZOL/ Pletal®) are available per Acurian at www.acurian.com, a pharmacy Web site. Remember, our intent is to provide educational information only. Please contact her doctor regarding the implications. Great of you to pick this up! Both drugs deal with the blood but in different ways. Please let me know what the doctor says. Take care!

In turn, the nurse specialist immediately queried the E-rehabilitation team members about this question. The next morning, the physiatrist replied that both medications "are indeed blood thinners and may indeed have something to do with the bruises she's experiencing." Later that morning, the pharmacist provided easy to understand descriptions for both drugs and explained the effect diabetes has on the choice of treatment. The nurse specialist summarized both messages to Norm asking him to please consult his wife's doctor. Several days later the nurse specialist received the following email. Norm said,

Just got back from the doctor, and she was impressed with the email that you sent re: my wife's blood situation. She had already discussed the two drugs with the other doctors, and both drugs are good for now. She also ordered blood work to be done. Thanks for the advice.

Available community resources and government services. There were various questions about available community and government services, such as respite care, Medicaid waiver programs and Medicare programs. In addition, questions about insurance coverage and physical therapy and how to access a lightweight wheelchair were discussed. Representative of this group of questions is the following dialogue about the Passport program, a Medicaid waiver program for older adults that provides community based services to prevent nursing home placement. Ann asked,

I was wondering if anyone knows anything about Passport? If anyone has any suggestions about outside care, I'd appreciate it. I hope all are doing well. Hello to Bette, and I hope your husband is doing OK after his fall.

The nurse specialist asked Ann the following questions that evening.

What type of outside help are you interested in? I have forwarded your question to our social worker and team for any further information. Do you have contact with a Social Worker that can help you with the choices available and financial issues? I think that this would be a big help to you! Which institution was your loved one's rehab in? Do they have outpatient services that you may need? Or are you looking for personal care such as a homecare aide? It sounds like your insurance may not cover the services you need? Let us know these answers.

The response about Passport from the social worker was quick and the nurse passed this descriptive answer to Ann the next morning. Sometimes there was no further communication about the question, as was the case in this example.

Stroke and related issues in dealing with stroke. Another group of questions focused on the stroke and related concerns in dealing with stroke. Issues of the care recipients' physical well-being (e.g. incontinence, dizziness, falls, nutrition, and function), and caregivers and care recipients' emotional well-being (e.g. chances of having a second stroke, frustration with recovery, and dealing with mood swings) were questioned.

Physical well being of the care recipient was often discussed. As an illustration, Norm asked about his wife's dizziness. He said,

This is probably an answer our nurse should do, but you other caregivers may be running across [this too]. Any input from you will help. Sometimes she [wife] has difficulty getting out of a chair, claims dizziness, 5 minutes later she is back on even keel.

The nurse specialist queried the team and the speech therapist responded. She said, "...the dizziness problem when getting up could be a blood pressure issue (orthostatic hypotension). I'll defer to the 'medical' team members for the final word about this, but I have had a number of patients with a similar problem." The physical therapist also replied, "Regarding the dizziness, muscle paresis can contribute to hypostatic tension. In addition, his wife's medications might be contributing as well." Another caregiver, Beth, also contributed to this discussion. She commented,

As far as your wife's dizziness, it could be some of her medications causing it. Whenever Mom and I do transfers, we stand and wait 30 seconds just to make sure that she doesn't become dizzy. It's a thought for you to try. I hope you folks are doing well, in spite of everything.

The nurse specialist summarized information about orthostatic hypotension and medication management from the E-rehabilitation team members in a message to both Norm and Beth.

Margie's question about nutrition and nausea is another exemplary question in regard to the care recipient's physical well being. She said,

My husband had 2 strokes and...progress is slow. His attitude is good but keeps losing weight because most foods make him feel nauseous. Any suggestions on weight-gaining foods would be welcomed. Stroke patients and caregivers have now been added to my prayer list. We found that humor really helps!

The nurse specialist queried the team members. The physiatrist suggested that the care recipient needed to be evaluated by his physician. The speech therapist commented,

...The biggest question would be, 'What is the nausea from?' It is not typical stroke sequelae and should be investigated. In patients that I have seen, their nausea resulted from medication, visual/equilibrium disturbances, or issues with their g-tube (although it doesn't sound like this individual has one).

The dietitian responded with specific ways to increase calorie and protein intake. The nurse incorporated all the team members' suggestions in a return message to Margie. A few days later, Margie replied that the problem was solved, as he was now taking one of his medications with food and "not on an empty stomach."

Many caregivers were worried about the possibility of a second stroke. Caregiver Joe's question was typical in regard to emotional well being. He said, "I am curious about the chances of a stroke occurring after a first stroke." The nurse specialist queried the E-rehabilitation team members and received the following responses. The physiatrist replied, "It is considerably higher, 30% comes to mind, but I'm not sure. This is affected by medications to prevent stroke..." The occupational therapist replied, "I do believe that the incidence for a second stroke is greater than a first stroke in someone who never had one." The speech therapist stated, "I just looked at my available references and all that I see is a general comment related to 'increased risk' following a stroke with no percentage details." The nurse specialist replied to Joe's question that there might be a higher risk of having another stroke, but so much depends on your risk factors. Please go to the American Stroke Association [<http://www.americanheart.org/presenter.jhtml?identifier=1200000>] web site to learn more about your question." She also encouraged him to talk with the family doctor.

Emotional well being, such as mood swings of the care recipient was questioned. Norm asked,

Sometimes she [wife] is melancholia and cries. Usually all these episodes last a few minutes, then she is back on an even keel. She even recognizes her spells, and is sorry to have given me a hard time. I see this as part of her recovery, and am kind of happy to see her trying so hard. I am wondering if I am using the right approach by letting her vent her frustrations and not being critical of her conduct. Are these mood swings typical of a recovering victim? She is seeing the family doctor on a regular basis, and doctor says 'so far so good.' I guess that I need to know if this is typical? Thanks.

The nurse specialist replied "that this may be common and is called 'labile' emotions...where the person with stroke goes from being just fine to tearful, depressed, or angry and back again to being fine." She encouraged him and said, "your approach is good, as you allow her to express her frustrations and anger at what has occurred to her...as long as you can deal with it!"

One caregiver summed up the essence of the web-based experience in welcoming a new caregiver. Margie said,

Please feel free to ask us anything or if you are having a bad day, you are free to come to this site and just 'scream' if you want to. Actually, I did that once and I ended up with a group hug from everyone.

Discussion and Implications for Practice

In the email discussions analyzed in this study, the focus of the questions and input was caregiver driven based on their current needs. On most general web sites, there is limited interactive and proactive teaching provided⁵, and there is insufficient control as to the accuracy and reputability of information presented on these sites.⁸ This is not the case on Caring~Web[®]. The presence of the nurse specialist and the E-rehabilitation team of competent professionals is valuable in that dubious, technical, or complex health information provided on any web site or presented by the caregivers can be explained. This was important as these caregivers asked a myriad of questions.

Using Friedemann's^{13,14} terms from the *framework of systemic organization*, these questions revealed that the caregivers of persons with stroke were exhibiting individuation [seeking new knowledge] along with coherence [being together and supporting one another]. Caregivers are expected to learn to live a purposeful life and to become aware of their own strengths and limitations through patterns of individuation. They are likely to receive coherence (emotional support and to find comfort through family and friends), as they seek system maintenance (maintaining themselves and their care recipients in home settings). Caregivers usually rely on family and friends to assist in system maintenance, as they employ daily routines and take care of caregiving responsibilities.^{13, 14}

Caring~Web[®] provided support by answering questions for caregivers of persons with stroke. This is in concert with the findings of Alexy 8 and Monnier et al.6 in that

caregivers thought the web-based support was a valuable resource in dealing with chronic disease. Similar to the work of Brennan et al. 7 who used email systems to provide education for persons recovering from CABG surgery, the caregivers used Caring~Web[®] to obtain information as well as assistance from peers and professionals. The Caring~Web[®] project differed from the Brennan and associates' study in that it focused on caregivers and not the person affected, and provided access to a nurse specialist and the E-rehabilitation team members.

Advantages of an E-rehabilitation Team

There are several advantages to this type of rehabilitation team. One of the most obvious is the access that it provides for caregivers to the rehabilitation team members. Caregivers can have input from the whole assembly of the healthcare team members, even though it is indirect. This array of professionals is greater in number than most of the face-to-face teams found sitting at the rehabilitation conference table. In addition, members of this E-rehabilitation team are educationally prepared as advanced practitioners and hold a master's or doctoral degree in their field.

Another advantage of the E-rehabilitation team is accessibility, relative to both time and distance. With the type of asynchronous communication used with Caring~Web[®], caregivers can ask their question(s) at any time during the day or night. They do not have to wait until a physician's visit or therapy appointment. If there is a large time delay, as is the case in conventional health delivery, the nuances of the particular situation can often fade and fail to be addressed. With the anonymity provided to the caregivers, they may also feel freer to ask sensitive questions. Likewise, the rehabilitation professionals are able to share their thoughts, answer questions, and address concerns at times that are more convenient for them, instead of during the busy clinic/work environment. Because it is not a synchronous communication situation, the E-rehabilitation team can research and really think about their responses prior to answering questions. The end-result is a more detailed account of a person's thoughts, concerns, and health care questions, which provides rehabilitation professionals with a better understanding of the issues, enabling them to provide a more thorough and comprehensive response. In addition, the intra-team communication can continue to exist, in that, the E-rehabilitation team member can e-mail or copy other team members on their thoughts on a certain matter resulting in less redundancy, greater coverage of the problem, and affirmation from the other team members.

The E-rehabilitation team also provides accessibility relative to distance. The Internet allows caregivers in many geographical locations to reach out and access the expertise of a variety of rehabilitation professionals, who may also be located in various geographical areas. The discussions that take place and the information and expert knowledge that is shared improve communication, understanding, and collaboration between the caregivers and the E-rehabilitation team, and between the members of the team. The availability of expert knowledge to anyone with Internet access is especially important for individuals in urban or rural and/or other under-served areas. Both caregivers and health care professionals can benefit from the discussions and the sharing of knowledge that takes

place with an E-rehabilitation team.

Disadvantages of an E-rehabilitation Team

A disadvantage of an E-rehabilitation team is the lack of human contact. Body language, non-verbal communication, and interpersonal interactions are minimal when communicating through the Internet. In order to obtain the benefits of Caring~Web[®], caregivers need to be able to express themselves in writing and to be confident enough to use an electronic means for information gathering. The team only knows about the caregiver through the caregivers written messages to the nurse specialist that are shared with team members. Knowing the caregiver's personal history, home situation, and about the care recipient and projected recuperation trajectory are all-important considerations when making any recommendations. It may be more difficult for some caregivers to thoroughly convey their thoughts, feelings, and concerns through electronic communications. Similarly, it is somewhat more difficult for the rehabilitation professional to offer empathetic and compassionate care through the Internet. The electronic communication format makes it more difficult for the typical dynamics of group interaction. However, E-rehabilitation teams are primarily consultative in nature, and must not replace regular visits to health care providers. The E-rehabilitation team is making recommendations based on the caregivers' impressions of a situation and their ability to express those impressions. Caregivers are told that the medical information presented on this web site is meant only for general educational purposes. They are encouraged to contact their healthcare provider for specific medical concerns or treatment. The use of an E-rehabilitation team, in addition to regular interactions during scheduled appointments with health care providers, can enhance understanding and communication between caregivers and their health care providers.

Conclusion

These caregivers were seeking new knowledge about medication management, available community and government services, and stroke and related issues in dealing with stroke. These are important topics for which information was needed as caregivers sought to maintain themselves and their care recipients in the home. This model of providing web-based education from an E-rehabilitation team can be easily adapted by other health care providers in clinical practice. It is an efficient and effective method of obtaining a vast amount of reliable information from various disciplines. The nurse specialist is then able to synthesize this information and present it to caregivers in concise segments that they can readily understand.

The usefulness of an E-rehabilitation team and its impact on practice is great if the problems of the caregivers are relatively straightforward and simple. For instance, if the caregiver relates that a spouse cannot reach down far enough to put on socks, then the nurse and/or occupational therapist may suggest a sock-aid to overcome their limited range of motion. However, if the spouse is having perceptual problems that are contributing to an inability to don socks, then a face-to-face visit with an occupational therapist may be warranted to problem solve with the caregiver and spouse. In addition, if

the underlying problem is of a very complex nature (e.g., perceptual difficulties), its manifestations are not usually limited to a single task; rather, it will infiltrate virtually all aspects of the care recipient's life and impact the caregiver as well. In a case such as this, it is clear that an E-rehabilitation team was not meant to nor can it take the place of visits with members of a conventional healthcare team. With that in mind, the E-rehabilitation team fulfilled its goal of providing helpful advice and suggestions, albeit with limited information about the caregiver or care recipient.

One caregiver shared, "Before my wife had the stroke, I didn't know anything about diabetes or stroke. The nurse [other professionals] and people in the group have helped me tremendously." An E-rehabilitation team can make a difference in meeting the needs of caregivers in providing fast and accurate information for questions asked about caring processes in dealing with outcomes of stroke.

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