Use of a Clinical Video Teleconference (CVT) Technology Model to Implement Patient Self-Management to Prevent Stroke

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Citation

J A Anderson, P Willson, K M Godwin, N J Petersen, T Kent. *Use of a Clinical Video Teleconference (CVT) Technology Model to Implement Patient Self-Management to Prevent Stroke*. The Internet Journal of Advanced Nursing Practice. 2014 Volume 13 Number 1.

Abstract

Purpose: Pooled V-STOP Program data were used to evaluate a nurse practitioner led, patient-centered stroke-risk reduction program delivered to veterans at risk for stroke living in rural areas via clinical video teleconferencing technology.

Data Sources: Originally a formative evaluation was completed based on a pilot, open trial, pretest/posttest design in 2 community based outpatient clinics. Veterans at risk for stroke completed questionnaires on stroke risk, self-management behaviors, self-efficacy, and quality of life.

Conclusions: Participants (N=37) showed improvement in their stroke risk knowledge (t=5.95, p<.001) over time; they had increases in their physical (t=2.15, p=.039) and emotional (t=1.99, p=.055) quality of life. Moreover, program participants had improvement in their self-management behavior of communication with health care providers at both 12 weeks (t= 2.6, p.014) and 18 weeks (t= 3.2, p=.003) post intervention.

Implications for Practice: The V-STOP Program not only promotes nurse-led, patient-centered care but also utilizes clinical video teleconferencing technology and partners with community clinics in rural areas to increase knowledge of stroke risk. The use of technology and community partnerships in this program allowed nurse practitioner providers to effectively deliver self-management support and stroke-risk reduction education among a population of rural veterans at risk for stroke.

INTRODUCTION

Many of the recommendations outlined in the Institute of Medicine's (IOM) Report on the Future of Nursing highlight the need to establish nurse-led health care that fosters patient-centered care with patient and provider partnerships and collaboration across settings to ensure continuity of care.1 Moreover, the IOM recommends that nurses should be given the structure and support needed to practice to the full extent of their education and training. An emphasis of nursing education has been in-patient and family-centered care and as healthcare providers, nurse practitioners (NPs) are ideally prepared to partner with patients in collaborative management of medical conditions, risk factor control, and disease prevention. The focus of this paper is to present an exemplar of the IOM's recommendation for NP practice through a report of pooled study findings from a NP led stroke risk reduction program. Numerous studies have shown that stroke risk can be reduced with effective risk-factor management.2-4 However, optimal stoke risk management requires providers and patients to work together5,6 using shared decision-making that incorporates clinical management with patient education and patient self-management support.7,8 Despite being recommended in clinical practice guidelines, educational support to help patients develop self-management skills for stroke risk reduction is not routinely provided and lags in community-based health-enabling information and communication technologies.9,10

STOP STROKE PROGRAM

The NP led a comprehensive stroke risk reduction program that incorporated patient-centered clinical management, patient education, and patient self-management training and support. The Stroke Program11 used the patient-centered care model where patients and APRN providers partnered in the management of stroke risk factors as well as care delivery processes that are often time fragmented in clinical

practice. The Chronic Care Model12 and the format of other well established self-management programs12-18, engaged patients as decision makers in their care and taught patients skills to help them take responsibility for the day-to-day management of their multiple chronic health problems. Patients in the STOP Stroke Program received individual stroke risk prevention guidance and clinical care during specialty clinic appointments to the NP provider, as well as, education and support for self-management actions to reduce individual stroke risk during nurse-facilitated classes at the Michael E. DeBakey Veterans Affairs Medical Center (MEDVAMC), a large Veterans Affairs (VA) hospital in Southeast Texas.

Summary data from program evaluation of the STOP Stoke program revealed information on the helpfulness and barriers of the program.11 All participants agreed or strongly agreed that the program helped them understand their personal stroke risk factors and the actions that would help them to reduce their risk of stroke. However, consistent attendance for clinic and self-management classes proved challenging with most patients missing 1-3 classes. Patients reported travel distance to the facility as the primary factor that prevented attendance at clinics and classes. Additionally, other identified barriers related to their travel were difficulty finding parking, stressful driving conditions, the cost of gas, and no transportation. When frequent appointments are required for participation in specialty care, prevention programs, and group education, attendance becomes problematic.

One possible solution for the barriers identified is clinical video teleconferencing (CVT). CVT technology has the potential to enhance access to these types of services for rural patients. Thus, the aim of this secondary data analysis was to test the effectiveness of using CVT technology to deliver the Stroke Program (V-STOP) to Community Based Outpatient Clinics (CBOCs). Video teleconferencing equipment was used to link patients and NPs during individual specialty clinic appointments and for group self-management classes. Specifically, these researchers aimed to describe the effects of V-STOP on patients' knowledge about stroke risk and self-management behaviors, self-efficacy, and quality of life (QOL).

METHODS

Pooled data from a 2-phase evaluation was undertaken.19 After institutional review approvals, the study took place at 2 CBOCs that were 60 and 150 miles from the main facility, requiring receiving CVT equipment at both CBOCs. Primary care providers referred veterans to the study if they were at risk of having a stroke due to a history of stroke or having multiple stroke risk factors. The patients received 2 CVT clinic appointments, 2-3 CVT self-management group classes and 1-2 telephone counseling sessions. Quantitative surveys were utilized to measure the effects of the intervention. Data were *collected at baseline, 12, and 18 weeks after completion of the intervention.*

The V-STOP Intervention

The development and refinement of the V-STOP intervention has been described in detail elsewhere.19 Briefly, the intervention consisted of group self-management classes and individual specialty clinic visits delivered via CVT and telephone counseling sessions with a NP. All patients were given the booklet The Veteran's Self-Management Guide to Stroke Prevention20 by CBOC staff upon enrollment in the study. This guide served as the patient education manual for the program. Group self-management classes included education on stroke risk factors and patient self-management of chronic conditions that contribute to stroke/transient ischemic attack (TIA) risk as well as group interaction activities (action planning/goal setting and problem solving) to foster social persuasion and modeling. During the 30 minute individual specialty clinic appointments, the NP was physically present in the neurology videoconference clinic at the main facility and interacted with the CBOC patients via CVT. The participant and the NP worked together to identify the participant's individualized stroke risk profile and to develop an individualized evidence-based clinical management plan. Patient education materials specific for the participant's risks profile were reviewed by the NP and the participant's action plan was reinforced to encourage goal attainment. During the next appointment, the participant and the NP evaluated the clinical management plan, made necessary adjustments (medical management and action planning), and further reinforced patient's goals. Finally, each participant received 20 minutes of individual telephone counseling that assisted in strengthening the patient's action plan and problem-solving strategies to address difficulties that prevented the patient from successfully completing their action plan.

Measures

Knowledge of stroke risk was assessed with 2 instruments: the National Stroke Association's (NSA) Stroke Risk

Scorecard21 and the investigator-designed stroke risk knowledge test (SRKT). The Stroke Risk Scorecard was developed to assist patients in recognizing their personal risk for stroke and is a useful tool to help patients understand the cumulative effect of multiple uncontrolled stroke risk factors. Patients score their level of risk on each of 8 factors (i.e., blood pressure control, smoking cessation, weight management). Points are summed for each risk factor to establish an overall stroke risk score (1-8 indicates low risk, 9-16 indicates medium risk, and 17-24 indicates high risk). The investigator-designed SRKT includes 10 true/false items on the warning signs and symptoms of stroke and activation of emergency medical services (i.e., calling 911) and has a score range of 0-10. These surveys were administered at baseline and at 12 weeks following the intervention.

Several previously validated survey instruments were used to measure health-related quality of life and self-management behaviors including self-efficacy, self-management of chronic disease, cognitive symptom management. The Self-efficacy for Managing Chronic Disease 6-Item Scale (SeMCD-6)22 was used to measure patients' self-efficacy across several domains common in chronic diseases (i.e., symptom control, role functioning, emotional functioning). The 6-item Cognitive Symptom Management Scale was used to measure the frequency of participants' cognitive symptom management behaviors (i.e., distancing themselves from their discomfort, translating feelings of discomfort into more acceptable feelings, ignoring feelings of discomfort, doing muscle relaxation, doing visualization or guided imagery, and talking positively to themselves about discomfort). The Communication with Healthcare Provider Scale22 was used toassess the extent to which patients were able to successfully engage in 3 areas of successful patient-provider communication: 1) preparing a list of questions prior to visiting their provider, 2) asking providers things about their illness that concern them, and 3) working out differences with their provider when they arise. The 6-item Exercise Behaviors Scale22 is divided into Stretching/Strengthening Exercise and Aerobic Exercise subscales and asks patients about the frequency of their exercise behavior. Finally, health-related QOL was assessed with the SF-12v2™, 23 a 12-item subset of the SF-36v2™ that measures the same 8 domains of health (physical functioning, physical role, bodily pain, general health, vitality, social functioning, emotional role, and mental health). All of these surveys were administered by the research assistant to patients at baseline and after completion of the intervention at 12 and 18 weeks.

Analysis

Pooled pre-posttest measures (N=37) were applied to describe the effectiveness of V-STOP on patients' stroke risk knowledge, self-management skills, self-efficacy, and QOL. For continuous variables, descriptive statistics and change scores were calculated. Paired t-tests and repeated measures analyses were completed as appropriate to analyze change over time. For categorical variables, the proportions of patients in the categories at baseline and at follow-up were calculated.

RESULTS

Sample

Patients (n=37) were predominately older, white, non-Hispanic males who had completed at least some college (Table 1). All had multiple chronic diseases with the top 5 medical conditions being hypertension (89.2%), diabetes (59.5%), heart disease (49.5%), arthritis (48.6%), and chronic pulmonary disease (24.3%). Additionally, over half (56.8%) of the patients also had depression.

Table 1

Demographic Characteristic (N=37)

	Mean	SD
Age	61	7.6
	N	**%**
Gender		
Male	36	97.3
Female	1	2.7
Race		
White	25	67.6
African American	12	32.4
Ethnicity		
Hispanic/Latino	3	8.1
Non-Hispanic/Latino	34	91.9
Education (Highest Grade Completed)		
0-8	1	2.8
9-12	12	33.3
13-16	21	58.3
>16	2	5.6

OVERALL FINDINGS

Patients' Stroke Risk Knowledge scores significantly improved over time while their NSA Stroke Risk score trended towards a significant decrease (Table 2).

Table 2

Patients’ Pre- and Post-test Scores on Stroke Risk Knowledge and Stroke Risk Scores (N = 37)

Measure	Pre-Test	Post-Test	Difference		
(Possible Range)	Mean (SD)	Mean (SD)	Mean (SD)	t-value	*p* value
Stroke Risk Knowledge† (1-10)	8.6 (1.4) n=37	9.7 (0.6) n=31	1.1 (1.1) n=31	5.95	*<.001*
NSA Stroke Risk Score†† (1-24)	13.7 (2.4) n=37	13.0 (2.1) n=33	-0.5 (1.8) n=33	-1.74	*.092*

†Higher score is better. ††Lower score is better.

Table 3

Effect of V-STOP Intervention on Patients Self-Management Behaviors and Functional Status

	Baseline (n=37)	12 Weeks (n=31)	18 Weeks (n=33)	Difference Baseline to 12 Weeks			Difference 12 Weeks to 18 Weeks		
Measure (Possible Range)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	t-value	*p* value	Mean (SD)	t-value	*p* value
Self-Management Behaviors									
Self-Efficacy† (1-10)	7.7 (1.7)	7.9 (2.0)	7.7 (2.3)	0.4 (1.5)	1.37	*0.18*	-0.2 (1.4)	-0.63	*0.53*
Cognitive Symptom Management† (0-5)	1.4 (1.1)	1.5 (1.2)	1.5 (1.1)	.2 (.8)	1.2	.26	.01 (1.06)	.03	.97
Communication with Health Care Providers† (0-5)	2.2 (1.2)	2.7 (1.2)	3.0 (1.1)	0.4 (.94)	2.6	.014	.46 (.78)	3.2	.003
Exercise Behaviors									
Stretching† (0-180)	34.1 (61.2)	32.9 (49.7)	57.7 (64.6)	1.9 (51.5)	-0.21	.84	18.6 (71.7)	1.4	.17
Aerobic† (0-540)	114.7 (104.5)	104.5 (119)	139.7 (144.9)	-11.6 (116.3)	-0.58	.58	27.9 (136.4)	1.1	.28
Functional Status									
Disability†† (0-3)	0.29 (0.34)	0.23 (0.33)	0.25 (0.35)	-0.05 (0.21)	-1.2	*0.24*	0.01 (0.2)	0.37	*0.72*
Social Activity†† (0-4)	1.28 (1.3)	1.28 (1.3)	1.22 (1.4)	0.13 (0.76)	0.93	*0.35*	0.07 (1.2)	0.31	*0.76*

†Higher score is better. ††Lower score is better.

Table 4

Effect of V-STOP Intervention on Patients’ Quality of Life (SF-12†)

	Baseline (n=37)	18 Weeks (n=33)	Difference Baseline to 18 Weeks		
Measure	Mean (SD)	Mean (SD)	Mean (SD)	t-value	*p* value
Physical	38.4 (12.1)	42.9 (12.5)	4.7 (12.7)	2.15	*0.039*
Bodily Pain	37.1 (12.7)	39.5 (14.6)	2.2 (9.5)	1.31	*0.198*
General Health	37.9 (12.6)	39.5 (11.5)	1.1 (14.0)	0.46	*0.652*
Vitality	47.2 (11.1)	46.5 (10.9)	-0.9 (10.2)	-0.52	*0.609*
Social Functioning	40.5 (15.5)	42.2 (14.7)	1.2 (12.0)	0.58	*0.563*
Role Emotional	42.3 (14.9)	45.2 (13.5)	3.2 (9.3)	1.99	*0.055*
Mental Health	48.1 (12.3)	48.7 (13.5)	0.2 (9.1)	0.12	*0.908*
PCS	36.3 (10.2)	38.1 (12.6)	1.7 (11.3)	0.87	*0.389*
MCS	47.7 (13.5)	48.9 (14.1)	0.9 (9.0)	0.58	*0.567*

Note. PCS=Physical Component Summary, MCS= Mental Component Summary

†= norm-based SF-12 scores allow comparison with the general US population which has a mean of 50 and standard deviation of 10.

While a statistically significant change was not seen in patients' self-efficacy for chronic disease self-management or their functional status (Table 3), patients did have significant changes in their physical QOL score and had a trend towards significance in the role emotional component of the SF-12 (Table 4). Additionally, patients showed improvement in the communication with health care providers at both the 12 week and 18 week follow ups (Table 3).

CONCLUSION

The V-STOP Program is an exemplar for how to implement many of the recommendations outlined in the IOM's report on The Future of Nursing which states that, "In order to meet the challenges of the future we must embrace technology, foster partnerships, encourage collaboration across disciplines and settings, ensure continuity of care and promote nurse-lead/nurse managed health care."1, p402 The V-STOP Program not only promotes APRN led, patient-centered care but also utilizes CVT technology and partners with community clinics in rural areas to reduce stroke risk. The use of technology and community partnerships in this program allowed NP providers to effectively deliver self-management education to reduce stroke risk (based on the

NSA Stroke Risk Scorecard) to a population of rural veterans at risk for stroke.

Moreover, the V-STOP Program is an example of how APRNs utilize their full training and education to implement patient self-management which promotes the delivery of patient-centered care for stroke prevention in primary care. The NP providers in this program worked closely with patients to develop individualized stroke risk profiles and individualized, evidence-based, clinical management plans. APRNs are uniquely situated to provide this level of patient-centered care because of their extensive training as primary care providers and their foundational nursing education on patient-centered care.

V-STOP shows promise as an effective method for APRNs to deliver health promotion and self-management education to veterans at risk for stroke via CVT. Patients in V-STOP increased their stroke risk knowledge over time and trended towards decreasing their stroke risk. Patients also showed improvement in the chronic disease self- management skill of communication with healthcare providers. Additionally, V-STOP patients had significant improvements in their physical QOL and had a trend towards significant improvement in their emotional QOL. V-STOP is limited in its generalizability due to small sample size and the selection of only 2 community based clinics. Because of the small number of enrolled patients, these researchers were unable to examine whether participants who had a history of stroke differed in the various outcome measures compared to those who had not yet had a stroke but who had multiple stroke risk factors. V-STOP was evaluated among veterans at risk for stroke and living in rural areas. A larger, more diverse sample of persons at risk for stroke is needed for further evaluation.

EXPOSITORY ACKNOWLEDGEMENTS

This work was supported by the Department of Veterans Affairs, Veterans Health Administration, Nursing Research Initiative (NRI) Health Services Research and Development Service (NRI 10-119-1). This work was partly supported by the Health Services Research & Development Houston VA Center of Excellence (HFP90-020) and by the National Research Service Award (T32 HP10031). This manuscript presents the findings and conclusions of the author(s); and it does not necessarily reflect the views of the Department of Veterans Affairs (VA), VA Health Services Research and Development (HSR&D), the US government or Baylor College of Medicine.

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