Codman Award Paper:
Self-efficacy of staff nurses for health promotion counselling of patients at risk for stroke

By Cheryl Mayer,
Mary-Anne Andrusyszyn and Carroll Iwasiw

Abstract
The effect of nurses’ confidence to counsel patients at risk of stroke in selected health promotion areas: smoking cessation, exercise and nutrition was examined. Bandura’s (1986) self-efficacy and Knowles’ adult learning theories provided the theoretical underpinnings for the study. This was a quasi-experimental design in which neuroscience nurses (N=23) from a quaternary hospital completed questionnaires prior to, immediately after, and 2 months post completion of a self-directed learning manual (SDL). The researcher-designed manual was designed to enhance learning about the risk factors for stroke and the importance of stroke prevention. Along with reflective activities and pre-post test, strategies for counseling high-risk, stroke-prone individuals in the areas of smoking cessation, exercise, and nutrition were also integrated.

The Health Promotion Counseling Self-Efficacy Scale (Tresolini, Saluja, and Stritter, 1995), consisting of 10 self-efficacy subscales relating to self-confidence in knowledge and ability to counsel in health promotion areas, was used to capture the nurses’ self-report of self-efficacy. Using a 5-point Likert Scale, nurses also rated their amount of agreement or disagreement about health promotion counseling in practice. Overall, self-efficacy levels for both knowledge and counseling increased significantly (p<.01) from pre-to immediately post completion of the manual, and decreased slightly at two-month follow-up. This pattern was evident in all health promotion areas measured except for knowledge in exercise (p=.015). Nurses’ attitudes about aspects of health promotion practices correlated significantly (p<05) at two-month follow-up with all health promotion areas. Results of this study support the usefulness of a self-directed learning manual as a teaching strategy for health promotion counseling of individuals at risk of stroke.

Keywords: professional education, self-directed learning, self-efficacy, stroke prevention

As the third leading cause of death and disability in Canada, stroke is one of the most devastating events experienced by humans (Bahle, 1998). Many stroke victims would rather die than live with disability and without dignity and quality in their lives. Increasing numbers of elderly persons, coupled with a doubling of stroke risk every decade after age 55,
mandate attention to stroke risk reduction (Bahle). It is important to recognize that the consequences of stroke extend beyond individuals and families to Canadian society. The direct and indirect costs of stroke are estimated to be $2.7 billion annually (Canadian Stroke Systems Coalition, 2001).

Recognition of a transient ischemic attack (TIA) provides an opportunity to prevent a subsequent stroke (Gorelick, 1995, 2002). One of every three Canadians possesses at least one risk factor for heart disease and stroke, and the identification and management of modifiable risk factors in high-risk patients is one of the most important and effective strategies for reducing the incidence of this disease (Ingall, 2000). One strategy is to promote and facilitate the adoption of healthy lifestyle practices in these individuals.

The need to prepare health care professionals who are skilled in health promotion practices has become increasingly important (Laschinger, McWilliam, & Weston, 1999). Primary care nurses are crucial to identifying factors that place individuals at risk for suffering a stroke, and then counselling them about the signs and symptoms of impending stroke and the importance of gaining control over the risk factors (Schretzman, 2001).

To maintain competencies and enhance self-efficacy in this area, nurses need sources of information that are accessible, cost-effective, and supported by the workplace (Nolan, 1998; Purdy, 1997). However, traditional didactic methods of teaching, which have predominated in nurse education, have not generally fostered self-directed learning and reflection. Nor have they been effective in the current nursing work environment. Thus, a strategy that encourages self-directed learning and reflection, and can be completed at a time, place, and pace that fit the learner’s schedule can be an alternative to traditional education (Knowles, 1990).

Self-directed learning can be achieved by reading professional journals, using the internet, attending professional workshops and seminars (DiMauro, 2000), and working through educational modules at an individually determined pace, without the aid of an instructor (Holtzman, 1999). It is reasonable to suggest that a self-directed learning manual may be an effective educational strategy to promote the self-efficacy of nurses for counselling patients at risk of stroke. The purpose of this study, therefore, was to examine the effect of a self-directed learning manual on neuroscience nurses’ self-efficacy for counselling patients identified as being at risk for stroke.

Theoretical framework

Knowles’s (1990) adult learning theory and Bandura’s (1986) self-efficacy theory provided the theoretical frameworks for this study. Adult learning theory, or andragogy, posits that adults move from dependency to self-directness, reflect upon their past experiences as sources for learning, are ready to learn when placed in new roles or situations, and want to apply any new knowledge gained using a problem-solving approach (Knowles, 1990). Adults are ready to learn once they identify a need to know something to complete a task. Successful task completion requires enhanced self-esteem and a belief in one’s self. Internal priorities such as increased job satisfaction can enhance self-esteem or build a sense of accomplishment or self-efficacy through goal achievement. Knowles (1990) suggested that programs should be developed using these principles and that educators should establish an atmosphere for learning that is cooperative in nature. Further, he proposed that educators should: encourage learners to assess their own learning needs, base learning objectives on these assessments, plan varying activities to achieve the objectives, and allow learners to evaluate if the learning was successful. Thus, educators become facilitators as they support a shift from a didactic or teacher-driven model to a self-directed learning approach.

According to Bandura (1986), self-efficacy is an individual’s perception of confidence in one’s own ability to perform a specific task or behaviour, and is acquired through an individual’s exploration and processing of four sources of efficacy: performance accomplishments or mastery experiences, vicarious experiences or symbolic role-modeling, verbal persuasion, and emotional and physiological arousal. Performance accomplishments or mastery experiences provide immediate evidence of whether or not one can succeed at a particular behaviour; it is the strongest predictor of self-efficacy. Past successful experiences tend to raise self-efficacy and unsuccessful experiences tend to lower it. Once experience and success have created a strong sense of efficacy in an individual, failure is unlikely to affect it. Vicarious experiences gained by observing another person’s successes and failures, especially one who is perceived to be similar, such as a peer, tend to raise self-efficacy to execute the particular behaviour. Understanding how one’s emotional state or physiological factors (stress, fatigue, arousal, aches, pains, or fear) can subconsciously debilitate performance, and receiving positive feedback from a credible individual (verbal persuasion) can raise an individual’s self-efficacy to execute a behaviour successfully.

The information individuals use to gauge their sense of efficacy must be processed and interpreted (Bandura, 1986). This cognitive processing plays a powerful role in the final judgments of efficacy. Self-efficacy judgments determine how much effort individuals will expend on a task and how long they will persevere at completing it. For individuals to execute a task successfully, they must believe they can perform the behaviour that leads to the desired outcome. Before they can believe they can perform the behaviour, however, they must acquire the necessary knowledge to execute it. Strategies must be put in place that will facilitate the development of this knowledge and perceptions of self-efficacy.

Educational strategies that incorporate the sources of efficacy information, such as: combining explanations with modeling, providing information on specific strategies, setting specific short-term and long-term goals, and giving explicit feedback to individuals about their performance can enhance self-efficacy development (Laschinger & Tresolini, 1999). In the current study, a self-directed learning manual, developed according to principles of Adult Learning Theory (Knowles, 1990) provided the sources of efficacy information (Bandura, 1986).

Literature review

Research and theoretical literature about nurses’ self-directed learning, nurses’ self-efficacy for health promotion, self-efficacy in other contexts, and stroke
Nurses' self-directed learning

The most common definition of self-directed learning is that of Knowles (1975): a process in which individuals take the initiative with or without the help of others in diagnosing their learning needs, formulating learning goals, identifying human and material resources for learning, choosing and implementing appropriate learning strategies, and evaluating learning outcomes. From this, self-directed learners have been characterized as possessing maturity; able to identify learning needs, objectives, resources, and strategies; capable of pursuing learning strategies and evaluating learning outcomes (Iwasiw, 1987). Nurses who are unable to direct their own learning will not have the skills necessary to meet changes in health care (O'Shea, 2003).

Self-directed learning is a collaborative process between learners and teachers (Hewitt-Taylor, 2001), and to be self-directed in continuing education, learners must be able to seek, analyze and utilize information effectively (Lunyk-Child, et al., 2001). Didactic teaching methods may not be an efficient strategy for self-directed learners (Nolan & Nolan, 1997a).

In two studies, registered nurses were reported to spend 152 hours (Dixon, 1991) and 217 hours (Emblen & Grey, 1990) in continuing professional learning activities in one year. As well, nurses scored significantly higher on a scale measuring readiness for self-directed learning than students in law and adult education (Oddi, 1988). These results suggest that nurses tend to be self-directed and motivated to seek additional education.

In addition to self-directed learning, a self-paced strategy may be effective for nursing staff development (O'Very, 1999). Self-paced learning is a method that takes the training to the individual and presents information in a brief, compartmentalized form that allows learners to complete according to their own schedule. It incorporates the adult learning principles of autonomy and self-direction, and provides a convenient way for health care providers to continue learning (Holtzman, 1999; Jenkins, Carlson, & Herrick, 1998; Sparling, 2001). Although initial design and implementation can be time-consuming, these manuals can be cost-effective. Lipe et al. (1994) demonstrated a restoration of 4.5 full-time equivalents per year from the classroom back to the patient care area, when nurses completed learning activities on their own time or during slow times on their units. Additionally, they cited an increase in compliance with mandatory inservice programs from 40% to 95%.

In a study addressing the learning needs of nurses upgrading their education from diploma to degree status, Morris (1999) compared the effectiveness of self-study and didactic sessions. Students in the didactic group (n=6) showed a slightly higher improvement in knowledge than self-study students (n=5). In response to open-ended questions, the self-study group reported they liked the opportunity for self-pacing.

Continuing education for credentialing of nurses working in a maternal/newborn unit in the military was provided efficiently and effectively through self-study modules that spanned a year. By 2001, the program had been established for 10 years and involved 460 hospitals and more than 9,000 nurses. The programs were theory-based, cost-effective, and portable. Practice hours were not lost because of staff leaving the work area for educational sessions, and staff appreciated the relatively low cost and the ability to complete the manual at a time and place of their choosing. Close to 90% of students achieved a mark of 90% on regular testing. However, accommodating different educational backgrounds of participating nurses and maintaining motivation for test completion were challenges (Rivero, 2001).

Nurses' self-efficacy for health promotion

Health promotion is a concept long emphasized in nursing education and self-efficacy for health promotion counselling has been studied. Laschinger and Tresolini (1999) compared the self-efficacy of third year baccalaureate nursing students (n=41) with fourth year medical students (n=60) for their knowledge and ability to engage in health promotion counselling. The Health Promotion Counselling Self-Efficacy Scale (HPCSES) developed by Tresolini, Saluja, and Stritter (1995) was used. Nursing students were significantly more efficacious than medical students on both overall knowledge and ability to counsel patients about health promotion.

Using a modified version of the HPCSES (Tresolini, et al., 1995) Laschinger et al., (1999) examined self-efficacy to counsel among nursing and medical students attending a Canadian University in a two-group, pre-post design. Nursing students’ (n=11) self-efficacy scores for counselling were significantly higher than medical students’ (n=31) scores, with the difference sustained at three-month follow-up (t(40)=2.30, p=0.05). Although the sample size was small, the study provided useful information about the importance of incorporating a health promotion focus in the professional curriculum.

Other self-efficacy studies

Self-efficacy theory has been used as a framework to evaluate continuing education in nursing. Davis and Hodnett (2002) assessed labor and delivery nurses’ self-efficacy and views for labor support, and described nurses’ perception of factors assisting and preventing the provision of labor support. Continuing education for advanced practice in pharmacology has been evaluated using self-efficacy theory (Murdock & Neafsey, 1995; Neafsey & Shellman, 2002; Neafsey, 1998). Neafsey concluded that measurement of self-efficacy was a useful adjunct in post-instruction evaluation and may be a cost-effective alternative to longitudinal impact evaluation.

In the clinical setting, Ockene et al., (2000, 2002) concluded, from studies addressing relapse and maintenance issues for smoking cessation, that predictors of relapse included low self-efficacy, and that brief interventions during medical visits were cost-effective and increased self-efficacy. Other self-efficacy studies include activity levels following cardiac surgery (Gortner & Jenkins, 1990), family caregivers’ adaptation to the stresses of the role (DiBartolo, 2002), quality of life post-stroke (Robinson-Smith, 2002), adherence to treatment regimens and preventative
Stroke prevention and role of the nurse

Hakim, Silver, & Hodgson (1998) proposed that best-practice stroke care in Canada must include prevention. Sacco (2001) published an account of controlled trials that demonstrated stroke risk can be reduced by blood pressure control, lipid lowering agents, surgery for carotid stenosis, warfarin for atrial fibrillation, and anti-platelet agents. This account also listed what is currently known about modifiable risk factors, i.e., hypertension, atrial fibrillation, other cardiac diseases, hyperlipidemia, diabetes, cigarette smoking, physical inactivity, carotid stenosis, and TIA.

Recognition of TIA and the identification and management of modifiable risk factors are the most important and effective strategies for reducing the incidence of this disease (Ingall, 2000). Based on literature examining the success of nurse-led clinics in cardiac disease, Schretzman (2001) concluded that there is at present a window of opportunity to develop the role of the nurse in the secondary prevention of stroke. How to facilitate the development and assess the effectiveness of this role has not been researched.

Summary

Studies of nursing students’ self-efficacy for health promotion have been conducted. However, staff nurses’ self-efficacy for counselling and means to enhance their self-efficacy for health promotion, have not been investigated. Although studies are limited in number, theory-based, self-directed learning manuals meant to be completed at a time, place, and pace of the learner’s choosing are effective in professional education. They are portable, cost-effective, and widely accepted by nurses.

Self-efficacy is a reliable predictor of behaviour change in a variety of contexts. In stroke prevention, high-risk individuals can be targeted for specific health promotion programs. However, nurses’ confidence to undertake this counselling is not known. It is reasonable, therefore, to determine the self-efficacy of neuroscience nurses to deliver risk factor counselling to patients at risk of stroke and to assess the influence of a self-directed learning manual on their self-efficacy.

Hypotheses and research question

The purpose of this study was to evaluate the self-efficacy of staff nurses to deliver risk factor modification counselling, after completion of a self-directed learning manual, to patients on a general neuroscience unit who have been identified as being at risk for stroke.

Hypotheses

Upon completion of a self-directed learning manual, immediate post self-efficacy scores (time two) will be significantly higher than pre self-efficacy scores (time one/baseline) in neuroscience nurses delivering health promotion counselling.

There will be no difference in the self-efficacy scores two months after completing the manual (time three) when compared to immediate post self-efficacy scores (time two).

There will be a positive correlation between self-efficacy scores and attitudes about risk factor counselling.

Research question

What is the relationship between neuroscience nurses’ post-test self-efficacy scores and selected demographic variables?

Methods

Design

A quasi-experimental, pre-post test, one-group design, was used to assess the self-efficacy of registered nurses (RNs) employed as staff nurses on a neuroscience unit in a quaternary care hospital to engage in counselling with patients at risk for stroke. Nurses completed a researcher-designed, self-directed learning manual focused on three areas of risk reduction: smoking, nutrition, and exercise. The subjects were their own controls.

The manual, based on the principles of adult learning theory, incorporated the sources of efficacy information and contained pre-and post-tests for assessing learning needs. Included were activities to enhance learning, promote critical thinking and reflection, encourage users to value and share experiential learning, and guide users to evaluate the success of counselling. Literature from medical and nursing journals about stroke prevention, risk factor identification and management was evidence-based and current. The warning signs and symptoms of TIA, risk factors for developing vascular disease, and strategies to promote smoking cessation, exercise, and proper nutrition were addressed. Expert faculty critiqued the manual at each stage of development for its consistency with the foundational theories and readability. Experts in stroke care reviewed the manual for content relevance. The manual was to be completed at a time, place and pace of each nurse’s choosing.

Sample

Convenience sampling was used to recruit nurses from the neuroscience unit at one quaternary hospital with an all-RN staff. Envelopes (N=76) containing a letter of information detailing the study expectations, demographic questionnaire, baseline self-efficacy questionnaire, and consent form were placed in all nurses’ mailboxes. With an alpha level of 0.05 (two-tailed), power of 80%, and a standard deviation for the difference score of 0.5, a sample size of 22 was required to detect a 10% change (absolute change of 0.3) in the pre-post self-efficacy score. The original sample consisted of 27 participants with a final data-producing sample of 23 (30.3%) nurses.

Instrumentation

The Health Promotion Counselling Self-Efficacy Scale (HPCSE) developed by Tresolini, Saluja, and Stritter (1995), that consists of 10 self-efficacy subscales: five relating to self-confidence in knowledge of three areas of health promotion and five relating to confidence in ability to convey this knowledge to patients in a clinical setting, was used in this study. Alpha reliability coefficients for knowledge and counselling subscales for each health domain across three data collection time points ranged from 0.71 to 0.94 (Laschinger, et al., 1999). Scale items referred to behaviours related to maintaining health in three areas: smoking, nutrition, and exercise. Counselling self-
efficacy scores for each health promotion areas were created by summing and averaging items measuring confidence in nurses’ ability to counsel clients. Knowledge self-efficacy scores for each health promotion area were computed in the same manner. Averaged subscale scores were computed. Response scales ranged from one to four with high scores indicating high self-efficacy. At baseline, Cronbach’s alpha reliability coefficient on all scales was acceptable at .81.

Five items designed to assess the contribution of sources or enhancers of efficacy information to nurses’ confidence were measured on a four-point Likert-type scale. A high score indicated a strong perceived contribution of a particular learning experience or source of efficacy information to nurses’ confidence in health promotion counseling. Attitudes of health promotion behaviour were assessed by asking the extent of agreement or disagreement to four questions about the importance of health promotion, using a five-point Likert scale, (Laschinger, et al., 1999).

Data collection procedures
Approval from the Institutional Ethics Review Board, permission from the nursing manager of the clinical neuroscience unit and the hospital’s professional practice leader of nursing were obtained. A questionnaire package was placed in nurses’ individual mailboxes. Signed consent forms and the demographic and baseline self-efficacy questionnaires were returned to the administrative assistant (AA) of the stroke clinic who assigned a code to each participant. The AA delivered the manuals and the post-manual (time two) questionnaire to participants, who were asked to complete the learning manual and return the time two questionnaire within six weeks. At six weeks, the AA sent a reminder letter and a new questionnaire to those who had not returned a completed questionnaire. Two months after receiving the completed time two questionnaire, the AA mailed the time three questionnaires and subsequent reminder as needed.

Data analysis
The Statistical Package for Social Sciences Program (SPSS) (Version 10 SPSS Inc., 1999) was used for analysis. Four of the 27 (15%) did not complete the time two or time three questionnaires even after being sent a reminder letter.

Frequency counts were compiled and estimated proportions were reported for all categorical demographic data such as age, sex, years in nursing practice, whether the participants were involved in continuing education, and roles outside the workplace. The summated scores of each scale were grouped according to concepts. Subscale means and standard deviations for each of three time points were computed; the assumption was made that data from the summated rating scales could justifiably be treated as interval rather than ordinal data (Nullay, 1978).

Hypotheses one and two: Single factor, repeated-measures analyses of variance (ANOVA) were conducted, using an alpha level of .01, to determine if there was a significant effect for the influence of the self-directed learning manual on the self-efficacy of nurses to counsel individuals at risk of stroke. Where a significant effect existed, Tukey’s post hoc procedures were employed.

Results
Sample description
In the data-producing sample of 23 participants (30% response rate), all but two were female. Most participants had college preparation (n=18) with three participants having a baccalaureate degree. Two received their nursing education in a hospital-based program. Their ages ranged from 22 to 60 years (M =37.11, SD=10.94) with the number of years in nursing practice ranging from one to 30 (M=12.17, SD=10.02). Thirteen participants (57%) were involved in additional educational activities. Of the 13 who indicated they were involved in additional roles, 61.5% (n=8) were involved in childcare, 7.7% (n=1) in eldercare and 30.8% (n=4) in roles ‘other’ than the above. These ‘other’ roles were not described.

Table One: Knowledge and counselling self-efficacy scores* across time (N=23)

<table>
<thead>
<tr>
<th>Self-efficacy</th>
<th>Time 1 (Mean SD)</th>
<th>Time 2 (Mean SD)</th>
<th>Time 3 (Mean SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Smoking</td>
<td>2.46 (.67)</td>
<td>3.67 (.67)</td>
<td>3.52 (.56)</td>
</tr>
<tr>
<td>Exercise</td>
<td>2.78 (.54)</td>
<td>3.66 (1.74)</td>
<td>3.47 (.56)</td>
</tr>
<tr>
<td>Nutrition</td>
<td>2.61 (.65)</td>
<td>3.24 (.70)</td>
<td>3.48 (.65)</td>
</tr>
<tr>
<td>Counselling</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Smoking</td>
<td>2.38 (.64)</td>
<td>3.45 (1.01)</td>
<td>3.44 (.56)</td>
</tr>
<tr>
<td>Exercise</td>
<td>2.62 (.62)</td>
<td>3.50 (1.53)</td>
<td>3.41 (.64)</td>
</tr>
<tr>
<td>Nutrition</td>
<td>2.50 (.68)</td>
<td>3.14 (.77)</td>
<td>3.37 (.77)</td>
</tr>
</tbody>
</table>

*pScale range 1-4

Table Two: Pearson Product-Moment Correlations between health promotion attitudes and self-efficacy scores at three time points (N=23)

<table>
<thead>
<tr>
<th>Self-Efficacy</th>
<th>Correlations</th>
<th>Health promotion</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Smoking Cessation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Knowledge</td>
<td>.15</td>
<td>.21</td>
<td>.62*</td>
</tr>
<tr>
<td>Counselling</td>
<td>.17</td>
<td>.01</td>
<td>.58*</td>
</tr>
<tr>
<td>Exercise</td>
<td>.03</td>
<td>.32</td>
<td>.68*</td>
</tr>
<tr>
<td>Knowledge</td>
<td>.17</td>
<td>-.17</td>
<td>.60*</td>
</tr>
<tr>
<td>Counselling</td>
<td>.32</td>
<td>.26</td>
<td>.61*</td>
</tr>
<tr>
<td>Nutrition</td>
<td>.30</td>
<td>.20</td>
<td>.59*</td>
</tr>
</tbody>
</table>

*p=.05
Hypotheses testing
Means and standard deviation scores for knowledge and counselling self-efficacy at time one, time two, and time three are presented in Table One. Overall, scores for both knowledge and counselling self-efficacy increased from time one to time two and decreased slightly at time three.

As predicted in hypotheses one and two, neuroscience nurses’ self-efficacy for counselling was significantly higher at time two and unchanged at time three. The hypotheses were supported.

Smoking cessation knowledge and counselling self-efficacy. The repeated measures ANOVA revealed a significant effect for nurses’ smoking cessation knowledge [F(1.47, 32.23) = 9.22, p < .01] and counselling self-efficacy [F(2, 44) = 18.44, p < .01] over time. Tukey’s post-hoc procedure (HSD = 0.89; a = .05 and HSD = 0.49; a = .05 respectively) revealed that time two and three scores were significantly higher than time one scores. There was no significant difference between time two and three scores. The effect size (h2) for within-subjects was calculated. Approximately 18% of the variance of scores for knowledge self-efficacy and 31% of the variance of scores for counselling self-efficacy were explained by time. The h2 values (0.18 and 0.31) are the equivalent of an f (effect size) value of .47 and .67 respectively and represent a large effect size (Cohen, 1988).

Exercise knowledge and counselling self-efficacy. For exercise knowledge self-efficacy, the repeated measures ANOVA revealed an effect approaching significance [F(1.25, 27.50) = 4.61, p = .015]. Tukey’s post-hoc procedure (HSD = 0.96; a = .05) revealed this difference to be between time one and time two (0.88). There was no significant difference between time two and three scores. The effect size for within-subjects (h2 = 0.11) is equivalent to an f value of .35 [moderate to large effect (Cohen, 1988)].

The analysis revealed a significant effect [F(1.39, 30.65) = 7.17, p < .01] for exercise counselling self-efficacy. Tukey’s post-hoc procedure (HSD = 0.76; a = .05) revealed that time two and three scores were significantly higher than time one scores, with no significant difference between time two and three scores. The effect size for within-subjects (h2 = 0.14) was calculated. Approximately 14% of the variance of scores for exercise counselling self-efficacy can be explained by time. The h2 value of .14 is the equivalent of an f (effect size) value of .40 or borderline large effect size (Cohen, 1988).

Nutrition knowledge and counselling self-efficacy. The repeated measures ANOVA revealed a significant effect for nurses’ nutrition knowledge [F(2, 44) = 27.80, p < .01] and counselling self-efficacy [F(2, 44) = 23.56, p < .01] over time. Tukey’s post-hoc procedure (HSD = 0.29; a = .05 and HSD = 0.32; a = .05 respectively) revealed that time two and three scores were significantly higher than time one scores. There was no significant difference between time two and three scores. The effect size (h2) for within-subjects was calculated. Approximately 24% of the variance of scores for nutrition knowledge self-efficacy and 20% of the variance of scores for nutrition counselling self-efficacy were explained by time. The h2 values (0.24 and 0.20) are the equivalent of an f (effect size) value of .32 (medium effect size) and .50 (large effect size) respectively (Cohen, 1988).

Discussion
Although the advantages of using a self-directed learning manual as an educational strategy to enhance professional education have been studied (Holtzman, 1999; O’Very, 1999; Rivera, 2001), this is the first known study to examine the self-efficacy of neuroscience nurses to execute a behaviour after completing such a manual. Except for exercise knowledge self-efficacy, the nurses’ knowledge and risk factor counselling self-efficacy following completion of a self-directed learning manual was increased. This study supports the use of a self-directed manual to increase knowledge and counselling self-efficacy, and validates aspects of Bandura’s self-efficacy theory.

Generally, nurses’ confidence in their knowledge was higher than their confidence about counselling. These findings are consistent with those of Laschinger and Tresolini (1999) and Laschinger et al., (1999), and can be partially explained by Bandura’s (1986) notion of self-efficacy magnitude. Specifically, individuals may have high self-efficacy for less difficult aspects of a set of behaviours.

While there was no significant improvement in exercise knowledge self-efficacy, exercise counselling self-efficacy scores were significantly increased. A possible explanation is that nurses initially were confident about exercise knowledge and the manual did not contribute any additional knowledge. Since prior knowledge was not measured, the manual may not have contained the appropriate learning materials or sources to facilitate an improvement in the nurses’ overall knowledge. It may be difficult to increase exercise knowledge through readings alone. Open-ended questions or an analysis regressing the nurses’ health promotion subscales on items intended to assess the sources of efficacy information provided by the self-directed learning manual might have been helpful. Interestingly, there is a noticeable difference in the standard deviations at time two for both exercise knowledge and counselling self-efficacy.

Summary of results
With the exception of exercise knowledge self-efficacy scores at time two, significant differences were found in the nurses’ knowledge and counselling self-efficacy scores over time. There were significant increases between time one and two scores and no significant differences between time two and three scores. Despite the relatively small sample size, the effect size magnitude was mainly moderate to large. The relationship between nurses’ attitudes and self-efficacy scores correlated positively and significantly at time three. There were no significant relationships between post self-efficacy scores and the selected demographic variables.
knowledge and exercise counselling self-efficacy (1.74 and 1.53 respectively). This deviation may partially explain why there was no significant finding for exercise knowledge self-efficacy.

Nurses’ self-efficacy levels decreased slightly but not significantly from post-completion of the manual to two-month follow-up. The pattern was consistent across the three health promotion areas and provides support for the utility of the manual. Measurement of self-efficacy has been found to be a useful adjunct in post-instruction evaluation of continuing education (Neafsey, 2002) and may be a cost-effective alternative to longitudinal impact evaluation. These findings may be explained by the theory. Bandura (1986) stated that once experience and success have created a strong sense of efficacy in an individual, there is reason to believe that the specific behaviour will hold up over time.

There was a positive correlation between self-efficacy scores and attitudes about health promotion (hypothesis three) at time three. Bandura (1986) stated that self-efficacy beliefs serve as motivators for engaging in and persisting with specific behaviours. Health promotion is a process. It might be that nurses had time to use knowledge, implement counselling, and receive feedback. Performance attainment may have led to more positive attitudes. From a methodological perspective, it is not known how attentive to detail the nurses were when reading and answering the questions. Many were sent reminder letters and some may have hurriedly completed the questionnaires. When using a questionnaire, it can only be assumed the responses are an accurate indication of behaviours.

No notable differences were found between the nurses’ post-test self-efficacy scores and selected demographic variables. This may have been because the sample size was too small for correlations to emerge.

In summary, after completion of a researcher developed, self-directed learning manual, the nurses’ self-efficacy to counsel patients at risk for stroke and attitudes about health promotion increased significantly, and the increase was maintained. The results of this study suggest that learning experiences that incorporate focused sources of efficacy information can have an impact on health promotion counselling self-efficacy. The consistency of the results provides encouraging support for the use of Bandura’s theory (1986) as a framework to guide educational strategies to develop health promotion skills of health professionals (Laschinger & Tresolini, 1999).

Limitations
The results of this study, although encouraging, must be viewed with caution. The sample consisted of neuroscience nurses in a single quaternary hospital who may not be comparable to nurses in general units or hospitals where exposures to stroke care experiences may vary. Future studies could be expanded to include nurses in other hospitals and other neuroscience units. Even though self-directed learning manuals are useful, it is important to remember that they may not be congruent with all learning styles or previous educational experiences. As well, the manual was not developed in accordance with all tenets of self-directed learning. For some nurses, having to complete the manual within six weeks may not have provided a comfortable pace. The study was based on self-reported confidence levels, performance was not observed or evaluated. Seventy per cent of nurses on the unit did not participate. These nurses may have perceived they had sufficient knowledge in this area or were overworked and did not have extra time in which to participate in a research study. In this study, the nurses’ prior knowledge of the subject material or prior health promotion knowledge were not measured. As a self-selected, volunteer sample, the nurses who did respond may be a special group who are self-directed and value continuing education and research. This may limit the generalizability of the results and the potential usefulness of the self-directed learning manual as an educational strategy to a varied population.

There was only one follow-up two months after completion of the module. Even though self-efficacy to deliver health promotion counselling was improved and held up over time, it is not known if this would be sustained over a longer period. However, since the study was based on the assumptions of self-efficacy theory, these limitations may be offset (Laschinger & Tresolini, 1999). Despite these limitations, the results provide previously unavailable data on the self-efficacy of neuroscience nurses to counsel individuals at risk of stroke and provide a basis for future research.

Conclusions
Despite limitations in the study design, neuroscience nurses’ self-efficacy in knowledge and counselling in selected health promotion areas increased significantly after completion of a self-directed learning manual. As self-efficacy scores improved, so did attitudes about health promotion in daily practice. Overall, the self-directed learning manual appeared to provide nurses with the appropriate learning experiences, and encouraged them to observe counselling and take opportunities to practise counselling. In conclusion, the results support Knowles’s (1990) adult learning theory, Bandura’s (1986) self-efficacy theory, and the potential future use of these theories as frameworks to guide educational strategies for continuing education for professional nurses.

About the authors
Cheryl Mayer, RN, MScN, is the the advanced practice nurse for the secondary prevention clinic for stroke at London Health Sciences Centre and Mary-Anne Andrussyszyn, RN, EdD and Carroll Iwasiw, RN, EdD, are associate professors in the School of Nursing at the University of Western Ontario, London, ON. They are co-founding editors of the International Journal of Nursing Education Scholarship. If you have any questions or comments about the paper, please contact Cheryl Mayer, Urgent TIA Clinic/Stroke Prevention Program, LHSC/University Campus, London, Ontario N6A 5A5, (519) 663-3674 (office), Cheryl.Mayer@lhsc.on.ca

References


