The development, implementation and evaluation of an educational program for staff nurses to identify and manage risk factors for ischemic stroke in patients with a history of migraine

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Abstract
The literature findings demonstrate that patients with migraines have a significantly high incidence of ischemic stroke (Kurth, 2010). Migraine is a common neurological disease that is defined very poorly and is estimated to affect between 1 % and 10% of men and 3 % and 20% of women within the United States (Buring & Hennekens 1995). Decreasing migraine frequency and management of modifiable stroke and cardiovascular risk factors’, such as hypertension, high cholesterol and smoking can help decrease risk of stroke occurrences (Tietjen, 2005). Therefore, to decrease stroke occurrence, it is imperative that staff nurses are educated on the importance of managing modifiable risk factors in patients with a history of migraine.

Document Type
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Degree Name
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First Supervisor
Christine Nelson-Tuttle

Second Supervisor
Heather MCCGrane

Keywords
migraine, stroke, nurse, educational program, risk factors

Subject Categories
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Scottia Jones, RN, BSN

Submitted in partial fulfillment of the requirements for the degree
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Wegmans School of Nursing
St. John Fisher College
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The development, implementation and evaluation of an educational program for staff nurses to identify and manage risk factors for ischemic stroke in patients with a history of migraine.

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GNUR 559
Wegmans School of Nursing
St. John Fisher College
INTRODUCTION:

The literature findings demonstrate that patients with migraines have a significantly high incidence of ischemic stroke (Kurth, 2010). Migraine is a common neurological disease that is defined very poorly and is estimated to affect between 1% and 10% of men and 3% and 20% of women within the United States (Buring & Hennekens 1995). Decreasing migraine frequency and management of modifiable stroke and cardiovascular risk factors', such as hypertension, high cholesterol and smoking can help decrease risk of stroke occurrences (Tietjen, 2005).

Therefore, to decrease stroke occurrence, it is imperative that staff nurses are educated on the importance of managing modifiable risk factors in patients with a history of migraine.

RESEARCH GOAL:

The primary goal of this educational program was to gather feedback from the participants on their perceptions of the presentation method and evidence based content within this educational program for their patient population. The purpose of this educational program was to develop and implement a presentation via PowerPoint with relevant information about patients with migraine and how their past co-morbid conditions and modifiable risk factors increase their risk for stroke. The staff nurses would use this education experience to enhance their knowledge in identifying stroke risks in patients with a history of migraine from the evidence based content. Upon completion of the educational program, an evaluation of the staff nurses perception and opinions on the method were used and collected to evaluate if the overall program was effective in empowering them to manage these patients more effectively.
BACKGROUND AND SIGNIFICANCE:

There are over 700,000 stroke cases each year in the United States (Graham, 2008). Stroke is the third leading cause of disability and mortality rates among women and men age 45-70 years (Kurth, 2010). Additionally, there is a seven-fold increase in risk factor in male and female stroke patients less than 45 years of age with a history of migraine.

According to Kurth (2010) women with probable migraine with visual aura had an increased risk of ischemic stroke that was apparent only for those with migraine frequency greater than 12 per year (p.134). The migraine-specific physiology involves both the neuronal and vascular systems, which has led to speculation that migraine may be a risk factor for ischemic stroke.

Each year, more research is being conducted to assess the etiology of stroke in patients with a history of migraine. Zotto et al (2008) examined several epidemiologic studies that report common risk factors, potential mechanisms of migraine-induced stroke and co-morbid transient ischemic attacks, which pose new research questions. Evidence suggests that migraine suffers age 35-44 years have an increased risk of an ischemic stroke when influenced by frequent onset of migraines with aura, oral contraceptives and smoking. This incidence of stroke may be a cumulative based of the hypercoagulability induced by oral contraceptives and the increased platelet activation that is clearly defined in several evidence based studies.

The suggestion that migraine may an independent risk factor for stroke was first examined in 1975, and reported in a meta-analysis by (Kurth, 2010). The 1975 study, Collaborative Group for the study in Young Women, as described by Kurth (2010) showed a doubling relative risk of stroke with the migraine when compared to a non-migraine control
sample. Both studies gave a hypothesis that specific patients with migraine with aura who
smoke, suffer from hypertension and cholesterol with a history of diabetes may have a higher
risk for an ischemic stroke in the future.

A population-based cohort study investigated the association in which age and sex
increases that risk of stroke in patients with and without migraine (Kuo et al., & Pan, 2013).
There were a total of 20,925 patients had confirmed medical diagnosis of migraine with migraine
treatment within this cohort. The authors confirmed migraine patients do indeed have a higher
risk for developing hemorrhagic stroke in both cohort groups with regards to patients being the
same age and sex.

A case-control study investigated the occurrence of headache attributed to acute stroke in
patients with a lifetime history of migraine (Nardi et al., & Sarchielli, 2008). There were a total
of 96 stroke patients with an established history of migraine enrolled within this cohort. The
study analyzed patients with confirmed brain infarctions based on neuroimaging findings and
previous history of migraine. The authors confirmed a higher prevalence of headache attributed
to stroke in these patients. In most cases the patients had reported headaches more frequently due
to the cerebral infarctions being localized deep with the brains gray matter (Nardi et al., &
Sarchielli, 2008).

In addition to co-morbid factors that increase risk of stroke associated with migraines, it
is also vital to examine the types of prophylactic migraine and cardiovascular drugs used in study
subjects (Buring & Hennekens, 1995). The mechanism and action of some drugs can cause an
increase vaso-activity and could increase the risk of stroke in many subjects. While evidence
suggests that the physiological effects of migraine sufferers’ platelet dysfunction and secondary
blood flow changes may cause an increase predisposition for a cerebral infarction in migraine sufferers, additional research is needed.

According to Lockhart (2006) focusing on competence, staff development and providing in-service educational activities for staff nurses, will ensure that staff nurses are knowledgeable and competent. Staff nurses possess expertise as direct care providers; and their experience in assessing, planning, directing and evaluating set forth standards to promote a safe and healthy work environment for our patients. Migraine and stroke are two complicated neurological disorders and both need rapid assessment and treatment of their vascular impairments. After a patient experiences a stroke, it is life changing; resulting in an increase hospital length of stay, along with excessive medical charges. It can be very costly to both the patient and the hospital. The impairments after a stroke are devastating for most stroke survivors. Therefore, development and implementation of an educational program to help staff nurses on how to identify risk factors for stroke occurrence in high risk patients with migraine is crucial. More educational programs are needed to increase knowledge on how migraine and stroke share common clinical features from studies that confirm and support an association.

**METHODOLOGY:**

This educational program was a quality improvement project presented on a neurology unit at a large Western New York hospital. An open discussion prior to program implementation on migraine and stroke risks was included and the method of the educational offering was a power-point presentation.

The improvement/accountability model CIPP (context, input, process and product) was used as a framework for this educational programs development and evaluation. According to
Fulton, Lynn & Goudreau (2014), the four components of the CIPP model help to assist in program planning and program quality and effectiveness, along with formative and summative evaluation of educational programs. The context process component of this model was applied to assess the need for migraine and stroke risk education for nursing staff by having an interview/meeting with their current nurse manager. The input component of the CIPP model was applied in the planning stage of the educational program by obtaining a commitment from their manager to ensure availability of nursing staff. There was two 4 point Likert scale questionnaires developed by applying the process and product components of the CIPP model and both questionnaires were used to evaluate the nurses’ satisfaction with educational programs presentation style, format and content and effectiveness before and after the presentation (Appendix 1 and 2).

The Database CINAHL, MEDLINE (January 1995 to 2013), and PubMed was searched and used as the methods to perform literature reviews and searches for best evidence based data related to migraine and its stroke risks. The goals of the educational program was to determine the perceptions of the staff nurses on the method and content used for the educational program. Open discussion was implemented to assess prior knowledge of the staff nurses on the risk factors that place patients with migraine at a higher risk of stroke occurrence and risk factor management, and if so would this information potentially have a change in how they manage this patients or bring more awareness in the future.

The educational program was coordinated and developed for the neurology unit were it was implemented and its effectiveness evaluated. There were a total of seven participants.

Before attending the educational program, each participant was asked to complete a Likert scale questionnaire before the presentation to obtain a formative evaluation of the
educational programs presentation method, style and format and their expectation of the educational offering (Appendix 1). The educational program had an open discussion and implemented as an in-service. The participants were provided an overview of what the in-service intended to accomplish. The learning method chosen was lecture, power-point style presentation.

The educational presentation summarized research evidence on migraine and stroke, the etiology of both neurological disorders, and co-morbid conditions that can put migraine sufferers at risk for stroke development. An overview of both neurological disorders and their overlapping clinical similarities and characteristics was discussed and treatment goals for managing these high risk patients were provided. Each discussion topic took three to four minutes in length. The total presentation was 20 minutes in length and took place in a small conference room located at the end of the neurology unit.

After completion of the educational program, each participant was asked to complete the post Likert scale questionnaire as an exit point to evaluate and determine whether the evidence based content and presentation style and format used for this educational program was effective in its learning outcomes and objectives after the presentation. The use of the post Likert scale questionnaire can be used to strengthen any weak topic areas and improve the overall program (Appendix 2).

Institutional Review Board (IRB) approval was obtained through both the academic institution and the medical institution.

DATA RESULTS:

Table 1 presents the responses from the pre-test questionnaire on presentation method, content, presentation style and format and assessing staff nurses' perception of being able to identify risk factors, etiology and management of migraine patients at high risk for stroke.
Table 1

<table>
<thead>
<tr>
<th>Pre-test Questionnaire (N=7)</th>
<th>Agree</th>
<th>3 (42.9%)</th>
<th>Strongly Agree</th>
<th>4 (57.1%)</th>
<th>Disagree</th>
<th>0 (0.00%)</th>
<th>Strongly Disagree</th>
<th>0 (0.00%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q1. The presentation method of the educational program is appropriate and useful to the target audience; and could I benefit from further education surrounding the etiology of migraine and stroke occurrence?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Q2. The content of the educational program is appropriate and is useful for this target population?</td>
<td>Agree</td>
<td>2 (28.6%)</td>
<td>Strongly Agree</td>
<td>5 (71.4%)</td>
<td>Disagree</td>
<td>0 (0.00%)</td>
<td>Strongly Disagree</td>
<td>0 (0.00%)</td>
</tr>
<tr>
<td>Q3. The presentation style and format of the content is appropriate for this topic; and could provide the ability to identify risk factor that may impact how I manage my current patient population?</td>
<td>Agree</td>
<td>4 (57.1%)</td>
<td>Strongly Agree</td>
<td>3 (42.9%)</td>
<td>Disagree</td>
<td>0 (0.00%)</td>
<td>Strongly Disagree</td>
<td>0 (0.00%)</td>
</tr>
<tr>
<td>Q4. I am able to identify the common risk factors associated with stroke occurrence in patients with a history of migraine?</td>
<td>Agree</td>
<td>4 (57.1%)</td>
<td>Strongly Agree</td>
<td>3 (42.9%)</td>
<td>Disagree</td>
<td>0 (0.00%)</td>
<td>Strongly Disagree</td>
<td>0 (0.00%)</td>
</tr>
<tr>
<td>Q5. Do you expect to gain an awareness from this presentation that will enhance your knowledge and current practice?</td>
<td>Agree</td>
<td>4 (57.1%)</td>
<td>Strongly Agree</td>
<td>3 (42.9%)</td>
<td>Disagree</td>
<td>0 (0.00%)</td>
<td>Strongly Disagree</td>
<td>0 (0.00%)</td>
</tr>
</tbody>
</table>

As shown in Table 2, the post Likert scale questionnaire responses after the educational in-service indicated that several staff nurses agreed that the topics and content of the presentation was of good quality, useful and appropriate, and effective in providing them with more
knowledge and awareness of risk factors for stroke in patients with migraines. Staff nurse also agreed that this content could impact how they manage migraine patients in the future.

Table 2

<table>
<thead>
<tr>
<th>Post-test Questionnaire</th>
<th>Agree</th>
<th>Strongly Agree</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q1. The topic of this educational program was useful and appropriate; and provided an awareness of impairments and risk factors which can lead to stroke occurrence in patients with a history of migraine?</td>
<td>1 (14.3%)</td>
<td>6 (85.7%)</td>
<td>0 (0.00%)</td>
<td>0 (0.00%)</td>
</tr>
<tr>
<td>Q2. The content of this educational program was helpful in identifying common risk factors; and content was (neither too simple nor too detailed)?</td>
<td>0 (0.00%)</td>
<td>7 (100%)</td>
<td>0 (0.00%)</td>
<td>0 (0.00%)</td>
</tr>
<tr>
<td>Q3. The educational program provided knowledge for me to identify risk factors and impairments involved in the etiology of migraine that can predispose patients to stroke occurrence?</td>
<td>2 (28.6%)</td>
<td>5 (71.4%)</td>
<td>0 (0.00%)</td>
<td>0 (0.00%)</td>
</tr>
<tr>
<td>Q4. The content of the presentation was appropriate for my target population and is relevant in my current practice?</td>
<td>0 (0.00%)</td>
<td>7 (100%)</td>
<td>0 (0.00%)</td>
<td>0 (0.00%)</td>
</tr>
<tr>
<td>Q5. The content of the presentation will impact how I currently manage patients who have a history of migraines?</td>
<td>1 (14.3%)</td>
<td>6 (85.7%)</td>
<td>0 (0.00%)</td>
<td>0 (0.00%)</td>
</tr>
<tr>
<td>Q6. The content provided good learning activities and was of good quality?</td>
<td>1 (14.3%)</td>
<td>6 (85.7%)</td>
<td>0 (0.00%)</td>
<td>0 (0.00%)</td>
</tr>
</tbody>
</table>
DISCUSSION

The goal of this educational program was to gather feedback from the participants on their opinion on the educational offerings. The participants’ perception regarding the method used to disseminate the evidence and the appropriateness of the content for their patient population.

The staff nurses felt that the presentation was useful and of good quality. They also felt that the overall content was effective in providing them with more awareness in their ability to identify high risk migraine patients, ultimately improving patient outcomes.

The overall responses ranged between agree to strongly agree for majority of the pre and post questions. The outcomes of both questionnaires were an essential part of the educational information on the staff nurses opinions on the appropriateness of an educational offering on migraine and stroke risks. These results suggest that there is an opportunity for improvement and a change in the standard of care for patients with migraines. In order to keep these staff nurses up to date on new evidence more frequent in-services would need to be provided to emphasize the importance of management and migraine frequency in high risk patients.

CONCLUSION:

Upon completion of this educational program staff nurses were able to provide their opinion on the appropriateness of this educational offering on migraine and stroke for their patient population. During the open discussion staff nurses reported that the content provided
was useful in bringing more awareness in identifying the etiology of migraine, clinical mechanisms and risk factors of ischemic stroke in patients with migraines. These results showed that there is an opportunity for neurology nursing staff to receive evidence based research so that they can have a better understanding in regard to migraine and stroke risks. Nursing play a crucial role in the delivery of healthcare and management of their patients. The development of educational activities that are designed to the learning needs of nursing staff will positively impact the practice of nursing and patient outcomes in the future.

**Limitations:** This educational presentation provided information to the nursing staff on the importance on managing the frequency of migraine attacks on migraine sufferers. There is a need for further investigation on migraine and stroke risks due to the potential consequences of a stroke event. Evaluating the impact of how these vascular and neuron function changes impact the outcome of migraine sufferers who experience a stroke validates the importance of continuing education for neurology nursing staff in the future.
References


APPENDIX 1

Questions appropriate for participants for review prior to educational program:

1. The presentation method of the educational program is appropriate and useful to the target audience; and could I benefit from further education surrounding the etiology of migraine and stroke occurrence.
   a. Strongly disagree
   b. Disagree
   c. Agree
   d. Strongly Agree

2. The content of the educational program is appropriate and is useful for this target population.
   a. Strongly disagree
   b. Disagree
   c. Agree
   d. Strongly Agree

3. The presentation style and format of the content is appropriate for this topic; and could provide the ability to identify risk factor that may impact how I manage my current patient population.
   a. Strongly disagree
   b. Disagree
   c. Agree
d. Strongly Agree

4. I am able to identify the common risk factors associated with stroke occurrence in patients with a history of migraine.
   a. Strongly disagree
   
   b. Disagree
   
   c. Agree
   
   d. Strongly Agree

5. Do you expect to gain an awareness from this presentation that will enhance your knowledge and current practice?
   a. Strongly disagree
   
   b. Disagree
   
   c. Agree
   
   d. Strongly Agree
APPENDIX 2

Questions appropriate for participants for review after educational program:

1. The topic of this educational program was useful and appropriate; and provided an awareness of impairments and risk factors which can lead to stroke occurrence in patients with a history of migraine.
   a. Strongly disagree
   b. Disagree
   c. Agree
   d. Strongly Agree

2. The content of this educational program was helpful in identifying common risk factors; and content was (neither too simple nor too detailed).
   a. Strongly disagree
   b. Disagree
   c. Agree
   d. Strongly Agree

3. The educational program provided knowledge for me to identify risk factors and impairments involved in the etiology of migraine that can predispose patients to stroke occurrence.
   a. Strongly disagree
   b. Disagree
   c. Agree
   d. Strongly Agree

4. The content of the presentation was appropriate for my target population and is relevant in my current practice.
   a. Strongly disagree
   b. Disagree
   c. Agree
   d. Strongly Agree
5. The content of the presentation will impact how I currently manage patients who have a history of migraines.
   a. Strongly disagree
   b. Disagree
   c. Agree
   d. Strongly Agree

6. The content provided good learning activities and was of good quality.
   a. Strongly disagree
   b. Disagree
   c. Agree
   d. Strongly Agree

Ideas for Improvement: