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Overcoming Barriers to Implement Depression Screening Post-Stroke

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Abstract

Background
One-third of all stroke survivors are expected to develop post-stroke depression, which is linked to lower quality of life, impaired recovery, increased risk of recurrence and an overall increase in mortality (Robinson & Jorge, 2015).
Objectives
Despite this link, outpatient clinics including the stroke clinic of focus do not consistently use a formal depression screen. Therefore, a pilot project utilizing the framework of the IOWA Model of Evidence Based Practice to implement this American Stroke Association recommended guideline may result in a permanent adoption of screening (Iowa Model Collaborative, 2017).
Purpose
The purpose of this evidence-based practice project was to implement depression screening through (1) the identification of barriers driving the absence of routine depression screening and (2) address those barriers prior to completing a 6-week pilot study.
Methods
The project consisted of an extensive literature review and selection of the Patient Health Questionarre-9 (PHQ-9) as the most appropriate screening instrument. The barriers to routine depression screening were identified as limited clinician time and limited clinician knowledge. Office efficiency was addressed by having the office registered nurse administer the PHQ-9 to patients. Provider education was completed using an 8-minute informational video module that included pre and post survey knowledge-based questions as well as a post pilot survey to evaluate provider perceptions of post-stroke depression screening.
Results
The clinic screened 45 eligible patients for the pilot, with no patients declining screening. Concern for significant markers of depression were identified in 17.8% of patients. Provider perception of the pilot screening was positive, with all providers agreeing that the PHQ-9 was an efficient tool, that depression screening was important to patient care, and that the overall project increased their knowledge of post-stroke depression. The clinic providers adopted routine screening as part of outpatient follow-up on a continuous basis following the pilot.
Conclusions
Significant barriers to identifying post-stroke depression are common. Increasing provider education and selecting efficient tools and methods for screening may help overcome barriers to successfully implement routine depression screening in the outpatient setting.

        Keywords: ischemic stroke, post-stroke depression, depression screening, outpatient

stroke care.

Overcoming Barriers to Implement Depression Screening Post-Stroke

Background

Post-stroke depression (PSD) is a common consequence of stroke and is associated with poorer physical recovery, increased risk of recurrence, and higher mortality rates (Robinson & Jorge, 2015). Post-stroke depression is well-documented, with a 2014 meta-analysis involving over 25,000 patients confirming previous findings that up to 31% of patients develop depression over five years following diagnosis (Robinson & Jorge, 2015).

The negative impact of post stroke depression on recovery has been known since the 1970's (Robinson & Jorge, 2015). However, there are numerous barriers to the routine screening of post-stroke depression in the outpatient setting (Swartz et al., 2016). These include identification of appropriate screening instruments, inconsistent follow-up care, high patient volume, limited provider knowledge, and lack of evidence to support specific treatments. Although the American Stroke Association includes depression screening within its guidelines, as Towfighi et al. (2017) report, there are no specific recommendations on when or how to do this effectively.

The purpose of this evidence-based practice (EBP) project was to introduce a standard way to complete a depression screen on all patients seen in the outpatient stroke clinic following hospital discharge as part of a 6-week pilot study. A priority of this project was to identify a suitable screening tool that had evidence-based support in identifying post-stroke depression, was efficient to use, and had minimal financial cost to the practice. An additional goal of the project sought to raise clinician awareness of PSD to help maintain consistency of depression screening as part of usual care for outpatient follow-ups.

Materials & Methods

Context and Patient Population

The stroke clinic of focus is an outpatient vascular neurology clinic with a sub-clinic devoted specifically to stroke follow-up after hospitalization. Prior to the pilot, the clinic provided no formal depression screening as part of its care. The implementation of an evidence-based improvement project following the Iowa model for Evidence Based Practice change was done to promote the adoption and regular use of a depression screening tool.

The clinic is staffed by four nurse practitioners and one registered nurse (RN) under the supervision of one stroke neurologist. The nurse practitioners provide coverage at the affiliated hospital, and provide outpatient follow-up two days per week, averaging 50 patients per month.

Participants

Patients identified for post stroke depression screening were those that followed-up after hospital discharge in the clinic. The patients were primarily from the city of Gainesville, Fl, and its surrounding rural counties. The target population was diagnosed with an initial or subsequent stroke within the 3 months prior to their outpatient visit. These 45 patients presented to the outpatient clinic within a 6-week period between February 6 and March 20, 2023. The age of the patients ranged between 23-100 years of age. Patients that were deemed eligible for PSD screening were those diagnosed with ischemic stroke and were at least 18 years of age. All patients were found to be eligible, and no patients declined to be screened.

Quality Improvement Methodology

The primary tool that was used to provide the outline for the implementation of the project was the IOWA Model of Evidence Based Practice to Promote Quality Care revised (subsequently referred to as the IOWA model) (Iowa Model Collaborative, 2017). The first step

of the model is the recognition of a trigger; in this case, the trigger was knowledge based and

part of a national guideline not adhered to (see Figure 1).

Team formation was a crucial part of the next step. In this case, the team included the

four nurse practitioners that also function as providers in the outpatient clinic, as well as the

clinic manager and the medical director. The DNP student participated within the team as the

project lead, providing guidance through the framework flowchart.

Selection of Psychometric Tool

Unfortunately, there is not one screening tool evaluated for post-stroke depression that

has excellent sensitivity and specificity, is brief, easy to use, and free of cost. The Patient Health

Questionnaire -9 (PHQ-9) as developed by Kroenke et al (2001) emerged as having high

usability, no associated costs, and had been tested on stroke patients within 6 months of

diagnosis (see Figure 2). Sensitivities ranged from 50% (Wang et al., 2018) to 100% (Wang et

al., 2018; Burton & Tyson, 2016). Specificity of the PHQ-9 had a wide range, 60-90%, but was

comparable to other screens in the evaluated studies. The PHQ-9 performed well in the first

study to look at this screening tool for diagnosis of PSD in 2005 (Williams et al., 2005). The

results were then replicated with studies in 2012 (de Man-van Ginkel et al., 2012a; de Man-van

Ginkel, et al., 2012b).

Through a comprehensive appraisal of the literature, the recommendation was made to

follow the guidelines for depression screening and to recognize the PHQ-9 as a reasonable

screening tool in both psychometric properties and ease of use. The team was then consulted and

approval for the project was granted by the medical director and practice manager.

The pilot intervention was planned. Barriers for project implementation centered on time-

constraints of the team as well as a knowledge gap around post stroke depression. The project

focus became the screening of all patients for post stroke depression at their outpatient follow-up appointment within the 6-week pilot. The office RN was tasked to screen eligible patients following a verbal consent with the PHQ-9 and then relay the results verbally to the provider with a copy of the screen available for their review.

Notably, this project implementation focused on increasing the screening for PSD, however, the ultimate diagnosis of depression and treatment decisions were beyond the scope of this project and were not addressed.

Educational Sessions

Post stroke depression (PSD) remains an underdiagnosed sequelae of stroke despite its prevalence (Swartz, 2016). One barrier identified was the knowledge gap of providers caring for patients with the diagnosis of stroke. Prior to the pilot implementation, an educational module focusing on PSD was presented to the nurse practitioners and RN. This module and video also included a pre and post questionnaire to determine their knowledge about PSD and their comfort in using the PHQ-9 depression screen (see Figure 2). Following the 6-week pilot, additional information was gathered to include perceptions about the use of a screening tool and its impact on their clinical practice (see Table 3).

The module included an informational power point presentation with a voice over lecture highlighting the prevalence, risk-factors associated with, and long-term outcomes of patients with PSD. The PHQ-9 does not require formal training for reliable use, but instructional links were also provided. Three of the four nurse practitioners as well as the RN completed the training prior to the implementation of the 6-week pilot and the post-pilot questionnaire.

<center>**Results**</center>

Descriptive Statistics and Project Outcomes

Paired sample *t*-tests were used to compare data from the pre and post video surveys. The small sample size limited the findings, but no statistical difference was found between the pre and post surveys. There were four knowledge-based questions posed to the nurses both before and after the educational video (see Table 1). All were aware that post stroke depression screening was recommended by the American Stroke Association and that the PHQ-9 did not require formal training. There was no agreement on the percentage of patients that are expected to suffer from post-stroke depression or the recommended timing and approved screening tools for PSD. Question 5, which asked the nurses to rate their knowledge of post stroke depression, did not change following the educational video.

The Statistical Package for the Social Sciences Software (SPSS version 28) was utilized to create a display of descriptive statistics. Overall, 45 patients were found to eligible for screening and 100% of these patients were screened using the PHQ-9. No patient declined screening. Scores on the PHQ-9 that are in the range of 10 or higher are felt to represent patients that need to be referred for further evaluation. During this 6-week pilot, 17.8% percent of patients fell into this range (see Table 2). There was no statistical difference found in the scores between the younger half of the respondents versus the older. However, in patients aged 85-100, 33% fell into the range of scores for clinical concern.

Five post-pilot questions were posed to the office nurse and 3 nurse practitioners who completed the initial education as seen in table 3. The range of answers to the 9-point Likert scale varied, but the means fell somewhere between somewhat agree and agree or agree and strongly agree. Following the educational module, no nurse perceived a change in knowledge level. However, following the screening pilot in its entirety, question 5 (which also addressed PSD knowledge) had a mean of 9 (Strongly Agree).

Ethical Considerations

The Institutional Review Board (IRB) of the applicable academic institution was consulted prior to the implementation of this project and deemed that it did not meet the federal guidelines definition of research and was therefore exempt. No protected health information was gathered by the DNP student. The number of patients screened, patient age, PHQ-9 scores and approximate dates of service were recorded on logs by the office RN. This information was transferred as a spreadsheet to the DNP student via email.

Depression screening is recommended as part of routine practice. The positive result of a screening tool should not be considered diagnostic, and any concerning results should be considered within the context of the entire patient care team (Sheehan & McGee, 2013). Any additional diagnosis, referral and/or treatment of depression was clinician dependent.

<center>**Discussion**</center>

Post stroke depression has been identified for over three decades as a common co-morbidity of stroke (Robinson & Jorge, 2015). Depression following stroke is known to impede recovery and increase risk of all-cause mortality and even an increase in stroke recurrence. Screening for post-stroke depression is recommended in the American Stroke Association Guidelines for the treatment and prevention of ischemic stroke but is often not completed in the outpatient setting (Swartz et al., 2016). During this 6-week pilot, 17.8% percent of patients had PHQ-9 scores that identified them as at risk for moderate to severe depression. This result is more in line from studies such as Swartz et al (2016) that found only about 5% of patients are recognized as suffering from post-stroke depression in the outpatient setting, while research tells us to expect fully 30%.

For the purposes of this project, it was not possible to have a baseline comparison group, however, no formal screening was taking place prior to the pilot. Experiential data from the providers supports the hypothesis that more patients are recognized with potential depression using a formal routine screening tool than without. However, this would need to be confirmed with further research. Other limitations for this project included the limitations of screening aphasic patients with the PHQ-9 and no alternate method currently available. Additionally, this project lacked sufficient sample size to determine if advanced age should be criteria for additional depression screening and or follow-up.

Barriers to the routine screening of post-stroke depression in the outpatient setting are common (Swartz et al., 2016). The use of the IOWA Model of Evidence Based Practice to Promote Quality Care revised allowed for a team-based structure in which to identify specific barriers to practice improvement (Iowa Model Collaborative, 2017). The team has determined that they will continue to use the PHQ-9 as part of routine follow-up stroke care in the outpatient clinic. The desire of this team to embrace improvement in patient care and their tolerance for the processes that support it are what ultimately sustained this project (IHI, 2020). This successful pilot may hopefully serve as a model for other teams that would also like to make evidence-based practice change a priority.

Conflict of Interest

There are no relevant financial or non-financial competing interests to report.

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Table 1

Increasing Identification of Post-Stroke Depression Educational Evaluation

Question	Data Source	Range of Values	Time Frame	Percent of Correct Responses/Mean
Studies suggest that at least 60% of stroke patients suffer from depression within 6 months of diagnosis.	Survey	1=True 2=False	Pre-education Post-education	Pre-0% Post-50%
Routine screening of stroke patients for depression is recommended by the American Stroke Association.	Survey	1=True 2=False	Pre-education Post-education	Pre-100% Post-100%
There is no consensus on the timing and frequency of post-stroke depression screening.	Survey	1=True 2=False	Pre-education Post-education	Pre-50% Post-75%
The PHQ-9 requires formal training to administer.	Survey	1=True 2=False	Pre-education Post-education	Pre-100% Post-100%
I am knowledgeable about how post stroke depression may affect my patient's recovery.	Survey	1=Strongly Disagree 2-4=Disagree 5=Neutral 6-8=Agree 9=Strongly Agree	Pre-education Post-education	Pre-7.5 Post-7.5

Note: Pre-education denotes questionnaire before educational session, post-education denotes questionnaire

immediately following educational session. No statistical difference found between pre and posttests (P=2.15).

Table 2

Increasing Identification of Post-Stroke Depression- Screening Severity

PHQ-9 Score	Data Source	Percent
0-4 No or minimal signs of depression.	Depressions Screening/Nurses Log	44.4%
5-9 Mild symptoms of depression	Depressions Screening/Nurses Log	37.8%
10-14 Moderate signs of depression	Depressions Screening/Nurses Log	6.7%
15-19 Moderately severe signs of depression	Depressions Screening/Nurses Log	11.1%
20-27 Severe and concerning signs of depression and possible suicidal ideation	Depressions Screening/Nurses Log	0%

Note: n=45.

Table 3

Increasing Identification of Post-Stroke Depression-Post Pilot Survey

Question	Data Source	Range of Values	Response Mean
The screening pilot prompted an increase in discussions with patients that included mental health concerns	Survey	1=Strongly Disagree 2-4=Disagree 5=Neutral 6-8=Agree 9=Strongly Agree	7.75
I found the PHQ9 to be efficient to use in the outpatient clinic setting.	Survey	1=Strongly Disagree 2-4=Disagree 5=Neutral 6-8=Agree 9=Strongly Agree	8.75
I intend to continue utilizing the PHQ9 as a depression screening tool with my patients in the stroke clinic.	Survey	1=Strongly Disagree 2-4=Disagree 5=Neutral 6-8=Agree 9=Strongly Agree	7.75
Recognizing post-stroke depression is an important part of optimizing stroke recovery.	Survey	1=Strongly Disagree 2-4=Disagree 5=Neutral 6-8=Agree 9=Strongly Agree	8.75
This pilot program which included an educational component and 6 weeks of depression screening increased my overall knowledge of post-stroke depression.	Survey	1=Strongly Disagree 2-4=Disagree 5=Neutral 6-8=Agree 9=Strongly Agree	9.0

Note: Post pilot survey completed following 6-week pilot of PHQ 9 in clinic.

Figure 1

IOWA Model (Revised)

Problem Focused Triggers

1. Risk Management Data
2. Process Improvement Data
3. Internal/External Benchmarking Data
4. Financial Data
5. Identification of Clinical Problem

Knowledge Focused Triggers

1. New Research or Other Literature
2. National Agencies or Organizational Standards & Guidelines
3. Philosophies of Care
4. Questions from Institutional Standards Committee

Is this Topic a Priority For the Organization?

Consider Other Triggers

No

Yes

Form a Team

Assemble Relevant Research & Related Literature

Critique & Synthesize Research for Use in Practice

Is There a Sufficient Research Base?

Yes

No

Pilot the Change in Practice

1. Select Outcomes to be Achieved
2. Collect Baseline Data
3. Design Evidence-Based Practice (EBP) Guideline(s)
4. Implement EBP on Pilot Units
5. Evaluate Process & Outcomes
6. Modify the Practice Guideline

Base Practice on Other Types of Evidence:

1. Case Reports
2. Expert Opinion
3. Scientific Principles
4. Theory

Conduct Research

Is Change Appropriate for Adoption in Practice?

Continue to Evaluate Quality of Care and New Knowledge

No

Yes

Institute the Change in Practice

Monitor and Analyze Structure, Process, and Outcome Data

- Environment
- Staff
- Cost
- Patient and Family
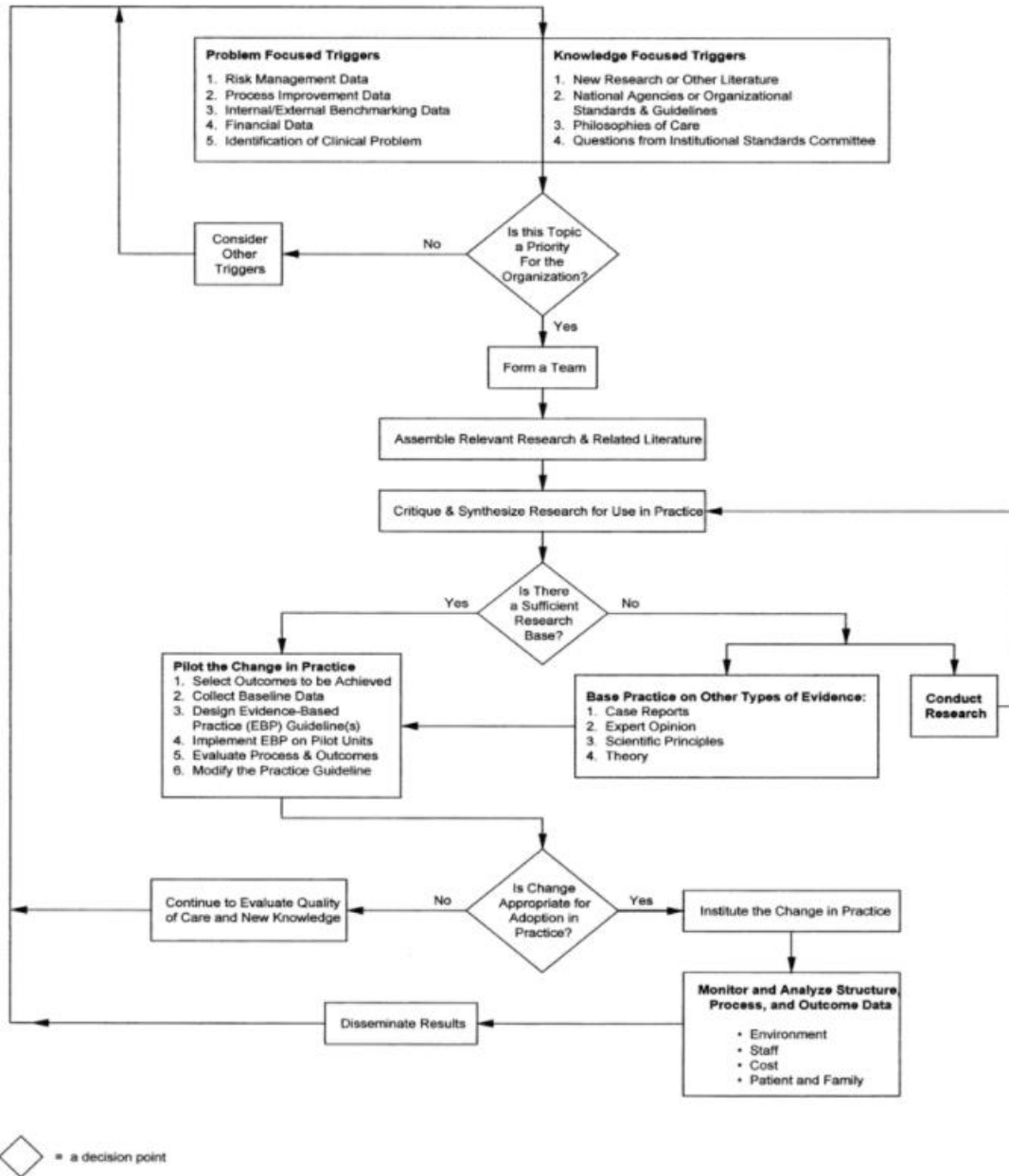
Disseminate Results

◇ = a decision point

Figure 2

Patient Health Questionnaire-9

PATIENT HEALTH QUESTIONNAIRE-9 (PHQ-9)

Over the last 2 weeks, how often have you been bothered by any of the following problems? (Use "✔" to indicate your answer)	Not at all	Several days	More than half the days	Nearly every day
1. Little interest or pleasure in doing things	0	1	2	3
2. Feeling down, depressed, or hopeless	0	1	2	3
3. Trouble falling or staying asleep, or sleeping too much	0	1	2	3
4. Feeling tired or having little energy	0	1	2	3
5. Poor appetite or overeating	0	1	2	3
6. Feeling bad about yourself — or that you are a failure or have let yourself or your family down	0	1	2	3
7. Trouble concentrating on things, such as reading the newspaper or watching television	0	1	2	3
8. Moving or speaking so slowly that other people could have noticed? Or the opposite — being so fidgety or restless that you have been moving around a lot more than usual	0	1	2	3
9. Thoughts that you would be better off dead or of hurting yourself in some way	0	1	2	3

FOR OFFICE CODING ___0___ + _____ + _____ + _____

=Total Score: _____

If you checked off **any** problems, how **difficult** have these problems made it for you to do your work, take care of things at home, or get along with other people?

Not difficult at all	Somewhat difficult	Very difficult	Extremely difficult
☐	☐	☐	☐