Evaluating the Relationship Between PHQ9 and Global Pain Scale (GPS) Scores in Opioid Dependent Adults: A Retrospective Correlational Study

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The document mentioned above has been reviewed and accepted by the student's advisor, on behalf of the advisory committee, and by the Assistant Dean for MSN and DNP Studies, on behalf of the program; we verify that this is the final, approved version of the student's DNP Project including all changes required by the advisory committee. The undersigned agree to abide by the statements above.

Lori Nolan, Student

Dr. Julianne Ossege, Advisor
Evaluating the Relationship Between PHQ9 and Global Pain Scale (GPS) Scores in Opioid Dependent Adults: A Retrospective Correllational Study

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Fall, 2018

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EVALUATING THE RELATIONSHIP BETWEEN PHQ9 AND GLOBAL

Dedication

I would like to dedicate my work to all the people who have supported me on my journey to a DNP. I could never list them all individually, but I am so fortunate to have had incredible faculty, friends and family over the past three and a half years. To my sister Kris, thank you for your support and encouragement. I love and appreciate you so much. To my friend Angela Saxena, MD, thank you for your help in securing clinical sites and for agreeing to take me as a student. You are one of the hardest working people I know, and you inspire me with your clinical knowledge. To the leadership staff, my co-workers, and the physicians at Frankfort Regional Medical Center, I have loved working with you the past 5 years and could never replace the bond and laughter we have all shared. To my children Ben, Sam, Elizabeth and Katherine, you will always be my greatest accomplishment. Thank you for your patience and understanding as I worked tirelessly and lost myself for endless hours studying, researching and writing. I know you proudly enjoyed watching me achieve my goal. Finally, I thank anyone and everyone who listened to me as I verbalized the range of emotions that accompany completing a doctoral graduate degree while managing that thing called life. I could not have reached this goal without each and every one of you.

“Whether you pushed me or pulled me, drained me or fueled me, loved me or left me, hurt me or helped me, you are part of my growth and I thank you.” -Author Unknown
EVALUATING THE RELATIONSHIP BETWEEN PHQ9 AND GLOBAL

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Dr. Amanda Wiggins, a huge thank you for organizing and analyzing the data I collected for this project. I was so relieved when you expertly pulled it all together, and it started to make sense.

Furthermore, I would like to acknowledge all the hard working DNP faculty in the College of Nursing. Your dedication and commitment to my graduate education is much appreciated. I feel so blessed and honored to have earned my DNP/FNP from the University of Kentucky.
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Abstract

Background: Depression, chronic pain and opioid dependence are conditions commonly encountered in primary care settings. These comorbidities create treatment challenges while negatively influencing outcomes of care. The Patient Health Questionnaire (PHQ9) and Global Pain Scale (GPS) are valid screening tools used to score depression and pain symptoms. The purpose of this study was to determine the relationship between the PHQ9 and Global Pain Scale (GPS) scores in opioid dependent adults with chronic pain to determine whether both tools are necessary.

Methods: This was a descriptive study using a retrospective correlational research design. Data was obtained from the electronic medical records (EMR) of 44 patients enrolled in a Chronic Opioid Analgesic Therapy (COAT) clinic between August 1, 2016 and July 31, 2017. Privacy was maintained through de-identification of data. The variables were analyzed using SPSS statistical software after all data was collected.

Results: A significant and positive correlation exists between the PHQ9 and GPS total scores ($r = .63$). In addition, all the sub scores of the Your Activities and Your Clinical Outcomes of the GPS were statistically significant and positively correlated to the PHQ9 at $p = <0.05$.

Conclusion: Understanding the relationship between the PHQ9 and GPS scores in adults with chronic pain and opioid dependence can improve depression screening and reduce respondent fatigue. The results of this study indicate the GPS may be sufficient to screen for depression, and the PHQ9 could be eliminated from the screening process.
EVALUATING THE RELATIONSHIP BETWEEN PHQ9 AND GLOBAL

Evaluating the Relationship Between PHQ9 and Global Pain Scale (GPS) Scores in Opioid Dependent Adults at the Polk Dalton Clinic

Introduction

Patients with chronic pain, depression and substance use disorders (SUD) are routinely treated in primary care. Approximately 52% of primary care patients are diagnosed with chronic pain (>3months), 5-13% have depression and 19% have a SUD (Barrett & Chang, 2016). These health issues are multidimensional and complicated by the fact that 50% of patients with depression and 65% with substance use disorders are undiagnosed or do not seek help (Barrett & Chang, 2016). The overlapping of depression, chronic pain and substance use, such as opioid dependence, presents treatment challenges to healthcare providers.

The US Preventive Services Task Force (USPSTF) recommends screening for depression in the adult population (age 18 or older) regardless of risk factors (Siu, 2016). This Grade B recommendation states depression screening should be performed with systems in place to provide “accurate diagnosis, effective treatment, and appropriate follow-up” (Siu, 2016, pg. 382). In this study, opioid dependent adults with chronic pain at a primary care clinic were screened for depression and pain symptoms using the Patient Health Questionnaire (PHQ9) and the Global Pain Scale (GPS) tools at each visit. The purpose of this DNP project is to determine the relationship between the PHQ9 and GPS scores in order to improve screening efficiency by eliminating unnecessary screening tools and decreasing survey response fatigue.

Background

Depression affects 350 million people worldwide, and fewer than half of all those who are diagnosed with depression receive treatment (WHO, 2016). The extensive influence depression has on medical conditions, behaviors and outcomes of care can make treatment
EVALUATING THE RELATIONSHIP BETWEEN PHQ9 AND GLOBAL

Challenging. Also, there is a strong association between physical and mental health (WHO, 2016). Depression has been shown to contribute to negative health behaviors in adults, such as obesity and smoking, and it is associated with many chronic diseases and conditions including diabetes, hypertension, stroke, heart disease, and cancer (CDC, 2016). The presence of depression and a co-existing health condition can affect functioning, quality of life, utilization of health care services, and health care costs (Barrett & Chang, 2016).

Chronic pain affects 100 million Americans, and is associated with poor social relationships, isolation, financial problems, and depression (Barrett & Chang, 2016). In addition, Barrett & Chang (2016) report the prevalence of substance use disorders (SUD) in patients with chronic pain is estimated at 48%. The authors state a diagnosis of depression along with chronic pain can increase pain intensity, disability, and negatively influence the clinical outcomes of pain treatment. The association between chronic pain, depression and substance use can interfere with effective depression diagnosis, treatment and outcomes of care (Barrett & Chang, 2016).

The National Institutes of Health (NIH) recommends utilizing behavioral health interventions in primary care settings where the comorbidities of opioid dependence, chronic pain and depression are present (Barrett & Chang, 2016).

Primary care providers may prescribe opioids to manage chronic pain with three to four percent of adults on long-term opioid therapy in the United States (Dowell, Haegerich, & Chou, 2016). More than 650,000 opioid prescriptions are written each day (HHS, 2016). The ethical and safety issues surrounding the prescribing of opioids for chronic pain include complications related to abuse and overdose (Dowell et al, 2016). Primary care providers must adopt measures to safely prescribe opioids for chronic pain without contributing to the growing problem of opioid dependence, abuse and related deaths from opioid misuse. An estimated 1.9 million
people were dependent on or abused prescription opioid medications in 2013 (Dowell et al., 2016), and prescription opioids were to blame for nearly half of all opioid overdose deaths in 2016 (CDC, 2018).

Opioids are effective and safe for the treatment of chronic pain in patients who are candidates for long-term use. Ballantyne (2015) states low doses of opioids can decrease pain and improve function in elderly patients with arthritis who cannot tolerate alternative treatments. The author also reports patients with serious disease states who have not restored function with other forms of treatment can also benefit from opioids. Suitable candidates must be screened and selected based on risk assessment and a complete history and physical to ensure safe treatment (Ballantyne, 2015). The decision to treat with chronic opioid therapy should be based on the benefits versus risk along with implementing written agreements and routine monitoring to help prevent misuse and abuse of opioids (Ballantyne, 2015).

The onsite Chronic Opioid Analgesic Therapy (COAT) clinic at an urban primary care medical office safely provides opioid treatment for patients with a chronic pain diagnosis. Acceptance into the COAT clinic is determined on an individual basis. The patients are required by contract to visit the clinic once a month where they are screened for depression and pain along with receiving a monthly prescription for opioids. It is important to screen this patient population for depression as many individuals with chronic pain often have depressive symptoms (Boakye et al., 2016).

Furthermore, depression increases pain intensity and often accompanies opioid use in adults with chronic pain (Barrett & Chang, 2016). Opioid dependent adults diagnosed with chronic pain and depression benefit from collaborative health treatments provided by a team of medical and nursing professionals, along with psychological and social work interventions.
EVALUATING THE RELATIONSHIP BETWEEN PHQ9 AND GLOBAL

(Barrett & Chang, 2016). A barrier to effective treatment of depression is inaccurate assessment and diagnosis (WHO, 2016). Hence, it is important to effectively screen and accurately diagnose depression in opioid dependent adults.

Screening tools can play a significant role in identifying those individuals at risk for depression. The Patient Health Questionnaire (PHQ9) is used to screen COAT clinic patients for depression symptoms at each monthly visit. It is a tool approved by the USPSTF for depression screening in adults (Siu, 2016). The PHQ9 can screen, diagnose, monitor and measure the severity of depression over time by rating the frequency of symptoms. Positive PHQ9 screenings should be followed up with additional assessments of depression severity and other psychological problems, such as anxiety (Siu, 2016).

The Global Pain Scale (GPS) is also administered at each COAT clinic visit to screen for pain, functioning and emotional well-being. This screening tool gives information on how chronic pain affects daily life. The evaluation of the correlation between the PHQ9 and GPS can improve the screening process in opioid dependent adults who suffer from chronic pain and depression. The use of only one of these tools may be all that is necessary to accurately screen for symptoms of depression.

**Theoretical Framework**

For this study, certain determinants of the theory of planned behavior can be used to understand individual habits and behaviors related to screening. Aizen, 1991 states the three determinants of this theory are attitude toward the behavior, subjective norms, and perceived behavior control. The author defines attitude toward the behavior as the extent to which the patient believes the behavior is beneficial or not, and the subjective norm as the social pressure
felt to perform the behavior. The third determinant is perceived behavior control, which is whether the individual feels the behavior will be easy or difficult to perform (Ajzen, 1991).

All three determinants interact to influence and predict intentions to engage in certain behaviors. Shah, Scogin, Pierpaoli, and Shah (2018) found both attitudes and subjective norms were strong predictors of willingness to complete depression screenings. The authors found most adults were receptive and felt there was a benefit to depression screening. Increasing subjective norms through education was also a strong predictor of screening acceptance (Shah et al. (2018). Perceived behavior control has not been shown to affect screening behaviors in a study completed by Breau, (2014).

Purpose

The monthly screening of COAT clinic patients with two screening tools at each visit raises the issue of poor response reliability due to survey respondent fatigue. Appropriate time intervals for screenings are not known (Siu, 2016); however, monthly screening with two tools could be burdensome for patients. The purpose of this project is to evaluate and compare the screening scores of the PHQ9 and the GPS in opioid dependent adults with chronic pain. The purposeful examination of these screening tools may eliminate overlap and repetition of depression screening to prevent survey fatigue.

The primary objectives are:

1. Describe the patient population in the Chronic Opioid Analgesic Therapy (COAT) clinic patients in terms of demographics (gender, age, ethnicity), depressive symptoms, and pain scores (GPS, Current Pain Level (CPL) and Acceptable Pain Level (APL))

2. Examine the relationship between depressive symptoms (using PHQ9) and pain scores (using the GPS) in the COAT Clinic patients
3. Determine the relationship between demographics (gender, age, ethnicity) and depressive symptoms (using the PHQ9) and pain scores (using the GPS) in the COAT Clinic patients.

4. Determine if acceptable pain level (scale ranging 0-10) correlates to depressive symptoms (using PHQ9) in the COAT clinic patients.

5. Determine the correlation between pain level (scale ranging 0-10) and depressive symptoms (using PHQ9) with the clinical outcomes and activities (using the GPS) in the COAT clinic patients.

**Methods**

**Study Design**

This study utilized a correlational study design to determine the relationship between the PHQ9 and GPS scores in the COAT clinic patients. A correlation analysis describes the strength and direction of the linear relationship between two variables (Pallant, 2016). A retrospective review of electronic medical records provided the data used in the analysis.

**Sample Selection and Site**

A primary care medical office in an urban setting was the site for this study. This primary care clinic offers family medical services across the life span. The sample for this study was obtained by extracting de-identified data from the electronic medical record (EMR) of Chronic Opioid Analgesic Therapy (COAT) clinic patients. All adult COAT clinic patients seen between August 1, 2016 and July 31, 2017 were included in the sample. Patients who did not complete the PHQ9 or GPS were excluded from the study. The sample size was 44 patients.
EVALUATING THE RELATIONSHIP BETWEEN PHQ9 AND GLOBAL MEASURES

The PHQ9 has 9 questions in a self-report tool incorporating DSM-IV depression diagnostic criteria. The frequency of symptoms are scored with a score of 5-9= minimal symptoms, 10-14= minor depression, dysthymia, mild depression, 15-19= major depression, moderately severe, >20= major depression, severe (CDC, 2016). The PHQ9 screening scores of 10 or higher have a sensitivity of 88% and a specificity of 88% for major depressive disorder (Savoy & O’Gurek, 2016).

The Global Pain Scale (GPS) assesses the physical and psychological impact of chronic pain on the individual. It is a simple and easy method to measure and track pain and treatment outcomes. This screening tool utilizes an eleven-point Likert scale (0-10) with 4 subscales: your pain, your feelings, your clinical outcomes, and your activities (Gentile, Woodhouse, Lynch, Maier and McJunkin, 2011). The ‘Your Pain’ subscale asks about current pain, along with the best, worst and average pain over the past week. The ‘Your Feelings’ subscale asks participants how they have felt in the past week related to the emotions of being afraid, depressed, tired, anxious and stressed. The ‘Your Clinical Outcomes’ subscale questions are related to the effect of chronic pain on sleeping, feeling comfortable, personal independence, working or performing normal tasks and medication use during the past week. The fourth subscale is ‘Your Activities’, and it asks whether the individual was able to go to the store, do chores in the home, enjoy friends and family, exercise and participate in hobbies during the past week.

Each GPS subscale is worth 25 points with a maximum total score of 100. The score is achieved by adding up the total score and then dividing by two. Higher scores represent worsened conditions. Gentile et al. (2011) found the total GPS scale reliable (Cronbach alpha 0.89) along with each subscale (pain 0.87, feelings 0.84, clinical outcomes 0.72, and activities
EVALUATING THE RELATIONSHIP BETWEEN PHQ9 AND GLOBAL

0.96). This screening tool has significant and moderate inter-correlations between subscales, which indicates high construct and criterion validity (Gentile et al, 2011). Therefore, the GPS and its subscales provide a good option for a reliable and valid method to screen for pain and depressive symptoms.

Acceptable Pain Level (APL) was recorded as the level of pain that is acceptable to the patient. It was measured with a scale of 0-10. The Current Pain Level (CPL) was the subjective level of pain at the time of the visit measured using a scale of 0-10. For both of these measures, a score of zero would be “no pain”, and a score of ten would be “the worst possible pain”.

Demographic variables were also collected to describe the sample. They included gender, age and ethnicity.

Procedures

Data collection for this study did not involve direct contact or intervention with the subjects, so informed consent was not necessary. The principal investigator was the sole researcher, and all EMR data extraction was performed on a desktop computer at the primary care clinic under the direct supervision of the COAT clinic director. Data extraction occurred from November 2017 to April of 2018. The patient visit within this time frame that included both PHQ9 and GPS scores was the dated used to extract study variables. Data was extracted and placed in an Excel spreadsheet. The spreadsheet and all relevant study variables were stored on an encrypted USB drive. The data was de-identified, and the confidentiality of the subject’s personal health information (PHI) was maintained. Human subjects exempt approval was obtained from the University of Kentucky Office of Research Integrity.
Statistical Analysis

Data was analyzed using SPSS software. The variables were summarized using descriptive statistics. The association or relationship between variables was tested with Pearson product moment correlation, Spearman’s rho, and two sample t-tests (Levene’s Test for Equality of Variances). Equal variances were assumed for the t-tests. Significance level was set at 0.05. Statistical analysis occurred at the completion of data collection.

Results

Demographics

The patient population was described using demographics, depressive symptoms, and pain scores (Objective 1). Forty-four charts were reviewed and demographic variables included gender, age and ethnicity. Females accounted for 77% (n=34) of the sample. Those between the ages of 56-65 years old represented 43.2% of the sample. The sample was evenly divided between Caucasians and African Americans.

The continuous variables of PHQ9, GPS, APL, and CPL were summarized using frequencies along with the mean and standard deviation. The majority of COAT clinic patients (68%) reported minimal to mild symptoms of depression on the PHQ9. Eight patients (18.2%) had moderate depressive symptoms and six individuals (13.6%) reported moderate to severe symptoms. There were no severe depression screening scores

The descriptive analysis of pain scores resulted in a GPS total score mean of 31(18.31). The current pain level mean was 6.23 (2.19), and the APL mean was 5.05 (1.18). In addition, the means were calculated for the ‘Your Clinical Outcomes’ and ‘Your Activities’ individual subscales. See Table 1.
EVALUATING THE RELATIONSHIP BETWEEN PHQ9 AND GLOBAL

Relationship between PHQ9, Acceptable Pain Level and GPS

The results for objective two indicate a significant and positive correlation between the overall PHQ9 and the overall GPS scores at 0.000 (r = .63). The relationship between the Acceptable Pain Level (APL) and PHQ9 (p = .08) was not statistically significant in this sample (Objective 4). See Table 2.

Table 2. Correlations among PHQ9, Acceptable Pain Level, and GPS

<table>
<thead>
<tr>
<th></th>
<th>PHQ9</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acceptable Pain Level (APL)</td>
<td>.27 (.08)</td>
</tr>
<tr>
<td>Global pain score (GPS)</td>
<td>.63(&lt; .001)**</td>
</tr>
</tbody>
</table>

** p = 0.01

Relationship between Demographics and PHQ9 and GPS

The relationship between the sample demographics, PHQ9 and GPS (Objective 3) was evaluated using group means, standard deviations, Spearman’s rho and independent samples t-tests. The results were not statistically significant (Table 3.). The p value at >.05 and the small rho value indicate a weak correlation between the demographics of age, gender and ethnicity and the PHQ9 and GPS scores.

Relationship between Current Pain Level, PHQ9 and Activities and Clinical Outcomes

Subscales of the GPS scales

Correlational analysis for Objective 5 illustrated positive and significant correlations between CPL and the ‘Your Activities’ sub score specifically the item of enjoying friends and family (r= .41, p =.01). The current pain level also had positive and significant relationships with the ‘Your Clinical Outcomes’ sub scores related to difficulty sleeping (r =.34, p =.03), comfort (r=.36, p =.02), and need for medication (r=.35, p =.02) See Table 4. In addition, all of
EVALUATING THE RELATIONSHIP BETWEEN PHQ9 AND GLOBAL

the sub scores of the ‘Your Activities’ and ‘Your Clinical Outcomes’ were statistically significant and positively correlated to the PHQ9 \( (p = < .05) \). See Table 5.

**Discussion**

**Key Findings**

In this study, the demographic, depressive and pain scores were described for the patients in the COAT clinic. Relationships were explored between the demographics and PHQ9 and GPS scores. Significant correlations were found between the PHQ9 and GPS total scores. In addition, the GPS subscales of ‘Your Clinical Outcomes’ and ‘Your Activities” were positively correlated with the PHQ9 and Current Pain Levels.

The sample was primarily women, middle aged and equally distributed between African Americans and Caucasians. These findings are relevant since the prevalence of major depression is higher in women than in men (Albert, 2015), and chronic pain has been shown to increase symptoms of depression (Barrett & Chang, 2016). The majority of reported depressive symptoms were minimal to mild. This may be due to survey respondent fatigue or antidepressant therapy. Data was not collected to determine those currently treated with either psychotherapy or pharmacotherapy for depressive symptoms; however, it is well known the use of antidepressant medications and psychotherapy are effective in reducing depressive symptoms (Cuijpers, Sijbrandij, Koole, Andersson, Beekman, and Reynolds, 2013).

The total GPS, APL and Current Pain Level scores were moderate. This could be due to some level of pain control by the prescribed opioid medication. Opioids in low doses can be helpful to decrease pain in low-risk individuals with a chronic pain diagnosis (Ballantyne, 2015). Pain management along with depression screening is important for the COAT clinic patients. Depression and pain are inter-related, and chronic pain can increase symptoms of depression.
The relationship between pain and depression was evaluated in Objectives 2 and 4 using the PHQ9, APL and total GPS scores. The close relationship between the PHQ9 and GPS indicates these two screening tools may be testing the same concepts. In particular, many of the questions in the GPS are related to emotions and function, which are similar to the PHQ9. The finding reinforces the close relationship between chronic pain and depression (Burke, Mathias, and Denson, 2015), and this relationship is present in the research. According to Barrett & Chang (2016), there is an intricate overlapping of chronic pain and depression pathways in the brain, and depression can create sensory changes that result in increased pain sensitivity. In contrast to the GPS, the APL scores do not show a relationship to the PHQ9. No evidence to support a relationship between APL and depression was found in the literature, but since APL is a subjective report of an acceptable pain level there may actually be a connection even though this study does not support it.

The PHQ9 and GPS have no preference or relationship to gender, age or race in this study (Objective 3). These results do not match literature findings on this topic. Research suggests older adults and African Americans are at an increased risk for experiencing depression (CDC, 2018). In addition, the Centers for Disease Control and Prevention (2018) report women are almost twice as likely to have depressive symptoms than men. The lack of connection between the PHQ9 and GPS for gender, age and race might be attributed to the adequate control of pain and depression resulting in lower screening scores. Unreliable screening results due to response burden and survey fatigue may have affected results as well.

Results suggest depressive symptoms and reported pain level have an effect on daily activities and functioning (Objective 5). Duenas, Ojeda, Salazar, Mico and Failde (2016) report chronic pain can have a negative impact on quality of life and daily activities. In particular, the
authors state there is a strong correlation between chronic pain and decreased physical activity, such as walking, performing chores around the house and participating in social activities. A chronic pain diagnosis can cause sleep disturbances, work absenteeism, increased stress levels and poor mental health (Duenas et al. 2016). Like chronic pain, symptoms of depression were found to negatively affect quality of life, increase stress and interfere with physical, interpersonal and social activities (Jayasekara et al. 2015). All ten items of the GPS subscales ‘Your Clinical Outcomes’ and ‘Your Activities’ correlated with the PHQ9. Interestingly, these ten times are also symptoms of depression.

**Implications for Practice**

There is a significant and positive correlation between the PHQ9 and GPS; therefore, an implication for future practice could be to remove the PHQ9 and only screen with the GPS. This would prevent test redundancy and problems with over screening. Excessive screening can lead to inappropriate treatment and may not always improve outcomes (Lenzer, 2017). The benefit versus harm of depression screening should take into consideration the difference between treating patients who have clinical depression compared to those who only screen positive (Lenzer, 2017).

On the other hand, there may be a detriment to patient care if a pain scale is used exclusively without a depression scale. Providers may only diagnose and treat pain whereas unidentified depression might be undertreated. Although the USPSTF does not recommend an ideal screening interval, clinical judgment should be used to determine if more frequent screenings with the PHQ9 are necessary depending on assessment of individual patient risk factors (Siu, 2016).
Further implications for practice could include the addition of an on site psychiatric APRN who can further evaluate and treat those patients who screen positive for depression. Over 60% of the COAT clinic patients had mild to moderate-severe depressive symptoms. The assumption is that a decrease in depression symptoms will result in a decrease in pain symptoms and lower opioid dependence. In addition, diagnosis and treatment of depression can improve symptoms and quality of life (Barrett & Chang, 2016).

**Implications for Future Study**

Implications for future study include performing statistical analysis to determine the relationship between the ‘Your Feelings’ subscale of the GPS and the PHQ9. The ‘Your Feelings’ subscale measures how pain is affecting the emotional state of the patient (afraid, depressed, tired, anxious, and stressed) over the past week. This was not addressed in this study, but it may affect the strength of the correlation between the overall PHQ9 and GPS scores. A factor analysis between the PHQ9 and GPS scores should also be done to determine PHQ9 and GPS similarities. Furthermore, data extraction from the EMR about antidepressant use could be relevant to the screening scores and frequency distribution. The PHQ9 score of those already being treated with antidepressant therapy may reflect different results than those who are untreated.

Identifying the relationship between the individual’s dose of opioid pain medication and the PHQ9 and GPS screening scores would also be of interest. It is well known chronic use of opioids is associated with depression, and those patients with depression are nearly twice as likely to use opioids for long-term pain relief (Davis, Lin, Liu and Sites, 2017). Increased opioid use in individuals with symptoms of depression can help identify the potential for adverse opioid treatment outcomes, such as misuse and overdose. (Davis et al. (2017).)
Limitations

There were several limitations identified with this study. For example, this study has a small sample size (N=44) and was conducted in one clinical setting. Therefore, the results may not be transferable or generalized to a larger population or setting. Also, the PHQ9 and GPS are validated screening tools, but repeated screening exposures may lead to desensitization resulting in unreliable scores. Furthermore, these screening tools are self-reported and subjective which increases the risk of response bias. Finally, there were at least three separate health care providers documenting screening scores in the EMR, which may have resulted in inconsistent data entry errors.

Conclusion

Patients with chronic pain, depression and opioid dependence present clinical treatment challenges in primary care. The PHQ9 and the GPS are reliable tools used to regularly screen for depression and chronic pain symptoms in this patient population. The administration of two screening tools at the monthly COAT clinic visit may not be necessary and can lead to excessive screening and inappropriate treatment. The results of this study show the GPS alone may be sufficient to screen for depression. Eliminating or decreasing screening frequency with the redundant PHQ9 could help lower survey respondent fatigue and improve response reliability and screening effectiveness in opioid dependent adults with chronic pain. This practice change may also enhance chronic pain management.
Table 1. Characteristics of Sample (N=44)

<table>
<thead>
<tr>
<th></th>
<th>Mean (SD) or n (%)</th>
</tr>
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<tbody>
<tr>
<td><strong>Gender</strong></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>34 (77.3%)</td>
</tr>
<tr>
<td>Male</td>
<td>10 (22.7%)</td>
</tr>
<tr>
<td><strong>Age</strong></td>
<td></td>
</tr>
<tr>
<td>26-35</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>36-45</td>
<td>5 (11.4%)</td>
</tr>
<tr>
<td>46-55</td>
<td>5 (11.4%)</td>
</tr>
<tr>
<td>56-65</td>
<td>19 (43.2%)</td>
</tr>
<tr>
<td>66-75</td>
<td>13 (29.5%)</td>
</tr>
<tr>
<td>76-85</td>
<td>2 (4.5%)</td>
</tr>
<tr>
<td>86+</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td><strong>Ethnicity</strong></td>
<td></td>
</tr>
<tr>
<td>Caucasian</td>
<td>22 (50.0%)</td>
</tr>
<tr>
<td>African Am</td>
<td>22 (50.0%)</td>
</tr>
<tr>
<td>Other</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td><strong>PHQ9</strong></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>3.57 (4.11)</td>
</tr>
<tr>
<td>Minimal 0-4</td>
<td>15 (34.1%)</td>
</tr>
<tr>
<td>Mild 5-9</td>
<td>15 (34.1%)</td>
</tr>
<tr>
<td>Mod 10-14</td>
<td>8 (18.2%)</td>
</tr>
<tr>
<td>Mod-Sev 10-14</td>
<td>6 (13.6%)</td>
</tr>
<tr>
<td>Severe &gt;14</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td><strong>Total GPS</strong></td>
<td>31.00 (18.31)</td>
</tr>
<tr>
<td><strong>Clinical Outcomes</strong></td>
<td></td>
</tr>
<tr>
<td>During the Past week:</td>
<td></td>
</tr>
<tr>
<td>I had trouble sleeping</td>
<td>2.12 (2.85)</td>
</tr>
<tr>
<td>I had trouble feeling comfortable</td>
<td>2.65 (3.24)</td>
</tr>
<tr>
<td>I was less independent</td>
<td>2.28 (3.25)</td>
</tr>
<tr>
<td>I was unable to work (do normal tasks)</td>
<td>2.67 (3.79)</td>
</tr>
<tr>
<td>I needed to take more medication</td>
<td>1.86 (3.31)</td>
</tr>
<tr>
<td><strong>Activities</strong></td>
<td></td>
</tr>
<tr>
<td>During the past week I was NOT able to:</td>
<td></td>
</tr>
<tr>
<td>Go to the store</td>
<td>2.37 (3.24)</td>
</tr>
<tr>
<td>Do chores in my home</td>
<td>2.70 (3.43)</td>
</tr>
<tr>
<td>Enjoy my friends and family</td>
<td>2.00 (2.96)</td>
</tr>
<tr>
<td>Exercise (including walking)</td>
<td>3.14 (3.73)</td>
</tr>
<tr>
<td>Participate in my favorite activities</td>
<td>2.53 (3.57)</td>
</tr>
<tr>
<td><strong>Current Pain Level</strong></td>
<td>6.23 (2.19)</td>
</tr>
<tr>
<td><strong>Acceptable Pain Level</strong></td>
<td>5.05 (1.18)</td>
</tr>
</tbody>
</table>
Table 3. *Correlations among demographics, PHQ9 and GPS*

<table>
<thead>
<tr>
<th>Demographic characteristics</th>
<th>PHQ 9</th>
<th>Global Pain Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>test statistic</td>
<td>p</td>
</tr>
<tr>
<td>Age</td>
<td>rho= -.18</td>
<td>.24</td>
</tr>
<tr>
<td>Mean (SD)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>3.56 (4.05)</td>
<td>.691</td>
</tr>
<tr>
<td>Male</td>
<td>3.60 (4.53)</td>
<td></td>
</tr>
<tr>
<td>Ethnicity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>1.41 (4.34)</td>
<td>.524</td>
</tr>
<tr>
<td>African Amer</td>
<td>3.73 (3.95)</td>
<td></td>
</tr>
</tbody>
</table>

Table 4. *Correlations among Current Pain Level, Activities and Clinical Outcomes*

<table>
<thead>
<tr>
<th>Current Pain level</th>
<th>r(p)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Your Activities</strong></td>
<td></td>
</tr>
<tr>
<td>Go to the store</td>
<td>.17(.29)</td>
</tr>
<tr>
<td>Do chores in my home</td>
<td>.15(.33)</td>
</tr>
<tr>
<td>Enjoy my friends and family</td>
<td>.41(.01)**</td>
</tr>
<tr>
<td>Exercise (including walking)</td>
<td>.23(.14)</td>
</tr>
<tr>
<td>Participate in my favorite hobbies</td>
<td>.25(.11)</td>
</tr>
<tr>
<td><strong>Your Clinical outcomes</strong></td>
<td></td>
</tr>
<tr>
<td>I had trouble sleeping</td>
<td>.34(.03)*</td>
</tr>
<tr>
<td>I had trouble feeling comfortable</td>
<td>.36(.02)*</td>
</tr>
<tr>
<td>I was less independent</td>
<td>.16(.30)</td>
</tr>
<tr>
<td>I was unable to work (or perform normal tasks)</td>
<td>.07(.70)</td>
</tr>
<tr>
<td>I needed to take more medication</td>
<td>.35(.02)*</td>
</tr>
</tbody>
</table>

** p = 0.01 level  
* p = 0.05 level
Table 5. Correlations among PHQ9, Clinical Outcomes and Activities

<table>
<thead>
<tr>
<th>Your Activities</th>
<th>PHQ9</th>
</tr>
</thead>
<tbody>
<tr>
<td>Go to the store</td>
<td>.53(.00)**</td>
</tr>
<tr>
<td>Do chores in my home</td>
<td>.35(.02)*</td>
</tr>
<tr>
<td>Enjoy my friends and family</td>
<td>.55(.00)**</td>
</tr>
<tr>
<td>Exercise (including walking)</td>
<td>.47(.00)**</td>
</tr>
<tr>
<td>Participate in my favorite hobbies</td>
<td>.56(.00)**</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Your Clinical outcomes</th>
<th>PHQ9</th>
</tr>
</thead>
<tbody>
<tr>
<td>I had trouble sleeping</td>
<td>.53(.00)**</td>
</tr>
<tr>
<td>I had trouble feeling comfortable</td>
<td>.64(.00)**</td>
</tr>
<tr>
<td>I was less independent</td>
<td>.60(.00)**</td>
</tr>
<tr>
<td>I was unable to work (or perform normal tasks)</td>
<td>.48(.00)**</td>
</tr>
<tr>
<td>I needed to take more medication</td>
<td>.34(.03)*</td>
</tr>
</tbody>
</table>

** p = 0.01 level
* p = 0.05 level
### 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)

<table>
<thead>
<tr>
<th>Problem</th>
<th>Not at all</th>
<th>Several days</th>
<th>More than half the days</th>
<th>Nearly every day</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Little interest or pleasure in doing things</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>2. Feeling down, depressed, or hopeless</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>3. Trouble falling or staying asleep, or sleeping too much</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>4. Feeling tired or having little energy</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>5. Poor appetite or overeating</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>6. Feeling bad about yourself — or that you are a failure or have let yourself or your family down</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>7. Trouble concentrating on things, such as reading the newspaper or watching television</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>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</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>9. Thoughts that you would be better off dead or of hurting yourself in some way</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

**For Office Coding**

\[ \boxed{0} + \boxed{} + \boxed{} + \boxed{} = \text{Total Score: } \boxed{} \]

**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?**

<table>
<thead>
<tr>
<th>Difficulty at all</th>
<th>Somewhat difficult</th>
<th>Very difficult</th>
<th>Extremely difficult</th>
</tr>
</thead>
<tbody>
<tr>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
</tbody>
</table>

Developed by Drs. Robert L. Spitzer, Janet B.W. Williams, Kurt Kroenke and colleagues, with an educational grant from Pfizer Inc. No permission required to reproduce, translate, display or distribute.
EVALUATING THE RELATIONSHIP BETWEEN PHQ9 AND GLOBAL

Image 2: Global Pain Scale (GPS)

<table>
<thead>
<tr>
<th>Global Pain Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Patient</strong> ___________________________ <strong>DOS</strong> ___________________________</td>
</tr>
<tr>
<td><strong>MR#</strong> ___________________________</td>
</tr>
</tbody>
</table>

**Instructions:** For each question, please indicate your level of pain by circling a number from 0 to 10.

**YOUR PAIN:**
- My current pain is ________________ No pain: 0 1 2 3 4 5 6 7 8 9 10 : Extreme pain
- During the past week, The best my pain has been is ________________ No pain: 0 1 2 3 4 5 6 7 8 9 10 : Extreme pain
- During the past week, The worst my pain has been is ________________ No pain: 0 1 2 3 4 5 6 7 8 9 10 : Extreme pain
- During the past week, My average pain has been is ________________ No pain: 0 1 2 3 4 5 6 7 8 9 10 : Extreme pain
- During the past week 3 months, My average pain has been is ________________ No pain: 0 1 2 3 4 5 6 7 8 9 10 : Extreme pain

**YOUR FEELINGS:** During the past week I have felt:
- Afraid ________________ Strongly Disagree: 0 1 2 3 4 5 6 7 8 9 10 : Strongly Agree
- Depressed ________________ Strongly Disagree: 0 1 2 3 4 5 6 7 8 9 10 : Strongly Agree
- Tired ________________ Strongly Disagree: 0 1 2 3 4 5 6 7 8 9 10 : Strongly Agree
- Anxious ________________ Strongly Disagree: 0 1 2 3 4 5 6 7 8 9 10 : Strongly Agree
- Stressed ________________ Strongly Disagree: 0 1 2 3 4 5 6 7 8 9 10 : Strongly Agree

**YOUR CLINICAL OUTCOMES:** During the past week:
- I had trouble sleeping ________________ Strongly Disagree: 0 1 2 3 4 5 6 7 8 9 10 : Strongly Agree
- I had trouble feeling comfortable ________________ Strongly Disagree: 0 1 2 3 4 5 6 7 8 9 10 : Strongly Agree
- I was less independent ________________ Strongly Disagree: 0 1 2 3 4 5 6 7 8 9 10 : Strongly Agree
- I was unable to work (or perform normal tasks) ________________ Strongly Disagree: 0 1 2 3 4 5 6 7 8 9 10 : Strongly Agree
- I needed to take more medication ________________ Strongly Disagree: 0 1 2 3 4 5 6 7 8 9 10 : Strongly Agree

**YOUR ACTIVITIES:** During the past week I was NOT able to:
- Go to the store ________________ Strongly Disagree: 0 1 2 3 4 5 6 7 8 9 10 : Strongly Agree
- Do chores in my home ________________ Strongly Disagree: 0 1 2 3 4 5 6 7 8 9 10 : Strongly Agree
- Enjoy my friends and family ________________ Strongly Disagree: 0 1 2 3 4 5 6 7 8 9 10 : Strongly Agree
- Exercise (including walking) ________________ Strongly Disagree: 0 1 2 3 4 5 6 7 8 9 10 : Strongly Agree
- Participate in my favorite hobbies ________________ Strongly Disagree: 0 1 2 3 4 5 6 7 8 9 10 : Strongly Agree

**Scoring:** Add up the total score and divide by 2. Each subset is worth 25 points. The maximum total score is 100.
EVALUATING THE RELATIONSHIP BETWEEN PHQ9 AND GLOBAL

References


EVALUATING THE RELATIONSHIP BETWEEN PHQ9 AND GLOBAL

https://www.cdc.gov/mentalhealth/basics/mental-illness/depression.htm


http://dx.doi.org/10.1001/jama.2016.1464


EVALUATING THE RELATIONSHIP BETWEEN PHQ9 AND GLOBAL


*BMJ.* doi: 10.1136/bmj.j743


http://www.who.int/mediacentre/factsheets/fs369/en/