Depression Screening and Awareness In Primary Care

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A working prototype of the proposed “Depression Awareness Screener” can be viewed at:
http://pi.cs.oswego.edu/~jmiles3/depression-awareness/

Introduction

The World Health Organization (WHO) Depression Fact Sheet reports that "Depression is the leading cause of disability worldwide, and is a major contributor to the overall global burden of disease." WHO states that suicide, a possible consequence of untreated depression, is the second leading cause of death in people 15-29 years-old and estimates a total of 800,000 deaths per year due to suicide. Based on data from WHO, despite being a condition with effective treatment options, depression remains untreated in fewer than half of affected people. Two out of three patients with depression will present to a primary care physician (PCP) and may be in denial about their condition or may fear the social stigma of being diagnosed with depression (Halfin, 2007). An initiative of the sixty-fifth World Health Assembly of the WHO (2012) was for all countries to establish stronger and comprehensive strategies for early identification, care, support, treatment and recovery of persons with mental disorders. The WHO 2012 initiative included objectives to "promote public awareness," "tackle stigma," and "empower service users" for all individuals dealing with mental disorders.

People with depression experience a spiraling deterioration of their mental and physical health. Stress and dysfunction will worsen a person's life situation which will, in turn, make depression worse. In a *Gallup* report from 2013, it was estimated that depression cost over 23-billion-dollars per year due to missed work days (Witters, Liu & Agrawal). A report from Maurer (2012) estimated a 43-billion-dollar annual medical cost of depression. The total financial burden of depression in the United States could be as much as 83-billion-dollars per year (Halfin, 2007). Siu (2016) identifies major depressive disorder as the leading cause of disability in high-income countries and can lead to mortality (suicide) as well as an impaired ability to manage chronic health issues. Halfin (2007) reports that people with depression are 4.5 times more likely to suffer a myocardial infarction. Palacios and associates (2016) assert that depression screening in patients with Coronary Heart Disease (CHD) is essential because CHD patients with depression experience more adverse outcomes and a higher rate of premature death due to cardiovascular disease. A study by Pibernik-Okanovic (2015) found that screening

diabetic patients for depression and offering even minimal support resulted in improved depression symptoms as well as improvement in diabetic condition.

Statement of hypothesis and goals

A United States' Healthy People 2020 (HP2020) goal is to decrease the suicide rate 15.7% by the year 2020. To combat the consequences of unmanaged mental disorders, HP2020 advocates the recommendation of the United States Preventive Services Task Force (USPSTF) that every person over 17 years-old should be screened for depression (Siu, 2016). It is a main goal of this project to utilize a simple yet effective computer program to assist with accurate depression diagnosis and assessment in a primary care setting. The computer program prototype is written in the Python programming language to allow for interoperability with other health care systems. The hypothesis is that initiating a computer-aided screening examination in primary care will help identify previously undiagnosed cases of depression. The objective would be to prove that effective depression screening can take place in primary care with nearly no financial cost and minimal time spent by health care providers in the administration of the screening test. The goal will be to show a statistically significant increase in diagnoses of previously unidentified depression compared to a usual care control that does not utilize the depression screening tool. It will be suggested to cross-over the control group to take the screening test after three months as a secondary source of data to prove that screening for depression in primary care will continue to identify unmanaged and treatable cases of depression.

Methods

The screening test chosen for the prototype screener is the Patient Health Questionnaire (PHQ). PHQ is freely distributed by Pfizer from http://www.phqscreeners.com/. Two versions of the PHQ test that have been studied by Kroenke, Spitzer and Williams to assess sensitivity and specificity for screening for depression are the PHQ-9 (2001) and the PHQ-2 (2003). The PHQ-2 asks two questions

from the PHQ: Over the last 2 weeks, have you been bothered by one of the following problems, 1) “little interest or pleasure in doing things” and/or 2) “feeling down, depressed or hopeless.” Kroenke, Spitzer and Williams (2003) found a 97.6% sensitivity for major depression for anyone that gave an affirmative answer for either question in the PHQ-2. Based on these results, the screener created for this study utilizes the sensitivity of the PHQ-2 as an initial filter (appendix A). PHQ-9 is a nine-question subset of the PHQ that asks if the patient has experienced specified problems “Not at all,” “Several days,” “More than half the days,” or “Nearly every day” with a respective score of 0, 1, 2 or 3 (appendix B). The total score of the nine questions correlates to a severity of depression of “minimal” for 0 to 4, “mild” for 5 to 9, “moderate” for 10 to 14, “moderately severe” for 15 to 19 or “severe” for 20 to 27 (Figure 1, Kroenke et al, 2001). The 2001 study by Kroenke and associates found that PHQ-9 was 88% specific for major depression with a score of 10 or higher. PHQ-9 will only be administered to patients if they give an affirmative answer to at least one of the questions in PHQ-2. The PHQ-9 will help determine the presence and severity of depression.

PHQ-9 Score	Severity of Depression
0 to 4	Minimal
5 to 9	Mild
10 to 14	Moderate
15 to 19	Moderately Severe
20 to 27	Severe

Figure 1

Review of literature

Halfin (2007) assessed the undertreatment of depression and found that early detection and appropriate treatment can result in sustaining full remittance of depression. The study by Palacios and associates (2016) observed improvements in quality of life and depression symptoms after screening and treating CHD patients for depression. Maurer (2012) reported poor prognosis for depressed patients dealing with Coronary Artery Disease, diabetes and stroke and particularly advocates for the use of PHQ-2 and

PHQ-9 to identify depressed patients that are dealing with chronic conditions so that appropriate care can be initiated. Pibernik-Okanovic and associates (2015) also utilized the PHQ-2 as an initial depression screener and found that even minimal intervention resulted in reductions in depression and diabetic distress.

Based on consensus and a review of literature, the USPSTF recommends screening for depression for everyone in the general adult population as long as adequate systems exist for appropriate follow-up (Siu, 2016). USPSTF does not recommend which screener to use and does not indicate how often patients should be screened. USPSTF also does not define the requirements for an "adequate system." Although not the focus of this study, a review of literature found many effective eHealth solutions that could be a "stigma-free" tool in the adequate treatment of patients diagnosed with depression in primary care ("Bluepages" and "MoodGym," Christensen, Griffiths & Jorm, 2004; various other internet based cognitive behavior therapies: Charova, Dorstyn, Tully & Mittag, 2015; Johansson & Anderson, 2012; Meglic et al, 2010; van Straten, Cuijpers & Niels, 2008).

Picardi and associates (2016) conducted a randomized control trial to assess if early screening for depression in primary care could have a positive effect on the treatment of depression. Both the intervention group and the control group had statistically significant depression screening test result improvement at a three-month follow-up (28.1% and 22.6% improvement, respectively). No study was found that assessed the rate of new-case depression diagnosis after initiating a screening examination versus standard patient assessment in primary care. Because of the lack of significant evidence, Thombs and Ziegelstein (2014) submit that there is not enough data to suggest depression screening for all adult patients in primary care. Though there is not currently good evidence for routine screening in primary care, literature seems to be in consensus that there is very little potential for harm for routine depression screening (Siu, 2016). From an economic perspective, the PHQ screening examination would be free to use and there would be very little cost to incorporate the screener in routine care. It is a primary objective to quantitatively and qualitatively show value for initiating a simple computer-based depression screener at the level of primary care and provide evidence-

based data for routine screening in primary care that is currently lacking (Thombs and Ziegelstein, 2014). As a parallel goal of this project, we hope to increase awareness of the impact of mental disease and decrease the stigma of depression, a problem that afflicts approximately 1 out of 10 adults (Witters and Agrawal, 2013). Additionally, it has been proposed to include depression screening for the Centers for Medicare and Medicaid Services' Star Ratings evaluation of medical providers by assessing the percentage of patients with a PHQ-9 score higher than 9 that achieve either a PHQ-9 score reduction of 50% or a score of less than 5 by a six-month follow-up (Larrick, 2015).

Experimental design and methods

(*Time in parenthesis is an estimated time frame for accomplishing the objective*)

The first step for this project would be to develop the functional depression screener from the prototype (10 days, a functioning prototype exists at http://pi.cs.oswego.edu/~jmiles3/depression-awareness/). A patient consent form will also need to be written and approved (appendix C). Since we wish to measure the number of new depression cases as determined by the PCP, the consent form will also need to verify that a patient has not been previously diagnosed with and/or is not being treated for depression. In the interest of best practices, we would also screen for patients that are or have been pregnant within the past year. Postpartum depression is beyond the scope of this project and has well-established depression screening tests like the Edinburgh Post Natal Depression Scale (EPDS, https://postpartumhealthalliance.org/screening-test/). Likewise, juvenile depression is an important and complicated situation that would not fall under the scope of this project, so our consent form would verify that participants were 18 or older in agreement with the USPSTF recommendation (Siu, 2016). Once given consent and answering negative for previous depression, negative for recent pregnancy and affirmative for 18 or older, the PHQ screener will be initiated as previously described and pictured in appendix A and B.

We will need to decide what demographic data is important to collect on all patients, such as age, gender, race, marital status, and comorbid conditions

[hypertension, diabetes, arthritis, pulmonary disease, etc] and create a form to collect this data (14 days).

We will need to find physicians in primary care practices interested in participating in the running of our study. It will be the discretion of the study administrators whether a primary care location has an adequate system for depression follow-up in compliance with the intent of the USPSTF recommendation. We would ideally involve four different locations and at least 150 patients per location (60 days to find physician participants). We would use 14 days at each practice to establish the use of the PHQ screener in the normal flow of patient care. A pattern of alternating days can be used over the course of four weeks to randomize patients. Group 'A' days would be designated for immediate screening using the "Depression Awareness Screener" (appendix A & B) and group 'B' days for standard practices and intent-to-screen as the control. We would assess demographics and receive consent for both groups (appendix C). For patients taking the PHQ depression analysis, a negative PHQ-2 response or a PHQ-9 score of 0 to 4 would indicate an unlikely case for depression and the PCP would receive a report of a negative screening. A PHQ-9 score of 5 or higher would indicate possible depression and would be brought to the attention of the PCP. New diagnoses of depression for both the screened ('A') and the control group ('B') will be tallied. Group 'B' will be informed that we intend to evaluate at a 3-month follow-up. Since treatment is not an emphasis of this study, the PCP will be instructed to treat patients with normal best practices. All patients in group 'A' will be screened with the PHQ examination on a 3-month follow-up either as a reassessment or as a gauge of improvement in depression condition (Maurer, 2012). Control group patients (group 'B') will crossover and be tested at the 3-month follow-up as long as they have not become pregnant or have not been previously diagnosed with depression. Primary data of interest would be the number of new depression diagnoses in both group 'A' and group 'B'. Secondary data observations will be changes in PHQ-9 scores and participant retention for the first three months. A final follow-up and reassessment with the Depression Awareness Screener will be conducted at 6 months to evaluate similar measures as the 3-month follow-up. A qualitative assessment of both study patients and primary care staff concerning the effectiveness and comfort level with

the PHQ screener will be conducted at the 6-month follow-up. We are striving to prove that universal screening for depression can be implemented as a value-added service with only minor interruptions to standard care.

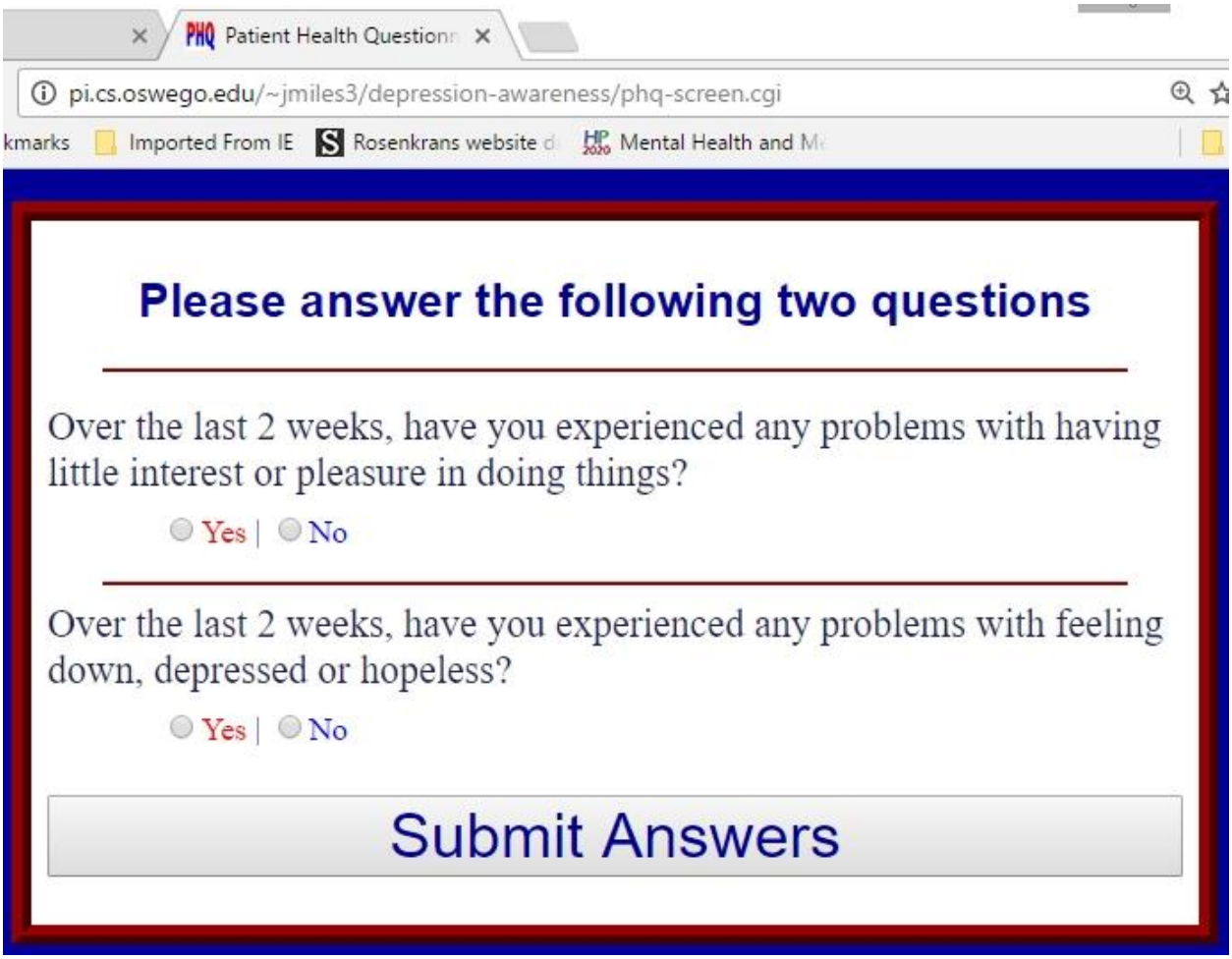
Conclusion and potential limitations

The USPSTF recommends the screening of depression in the general adult population (Siu, 2016). Routine depression screening could enhance patient care when seamlessly added to regular follow-ups with a primary care physician, especially for patients dealing with comorbid chronic conditions like diabetes and heart disease (Pibernid-Okanovic et al, 2015; Picardi et al, 2016). We must first obtain an early and accurate depression diagnosis before being able to treat the underlying depression and improve the overall condition of a patient. This proposed computer-based screening test should add value to patient care and should not be regarded as a substitute for a doctor-patient interaction. One limitation of the Depression Awareness Screener is that if it holds to a 97.6% sensitivity, an average of 24 out of 1000 patients will have a missed depression diagnosis. Because a parallel goal of this project is to increase awareness and decrease stigma concerning depression, it is possible that the control group will receive more attention for undiagnosed depression regardless of whether or not they take the screening examination. It is our expectation that there would be more attention paid to depression symptoms in both groups ‘A’ and ‘B’ than under normal patient assessment conditions. It is our hope that our “intent-to-screen” the control group will help avoid a bias leading to the type II error of failing to prove the superior value of running a computer-based PHQ assessment of depression in primary care. Even in the case of a type II error, we hope to establish the functionality of the Depression Awareness Screener while elevating awareness of depression in the United States.

Abbreviations

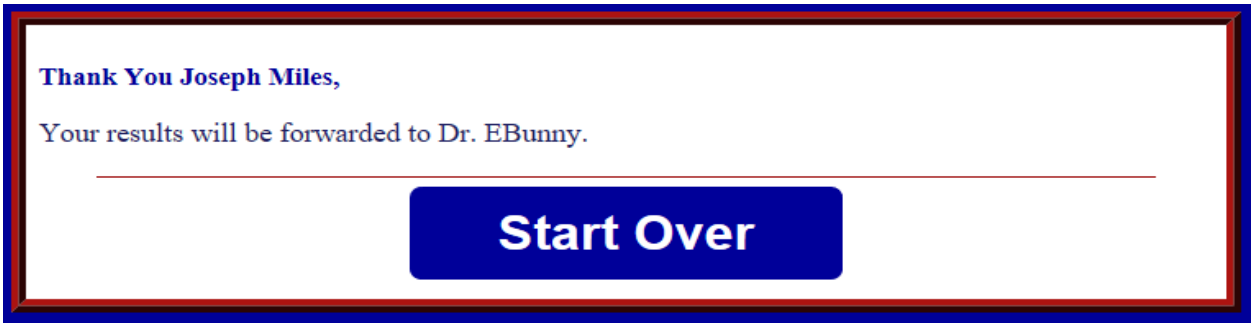
CHD	Coronary Heart Disease	PHQ	Patient Health Questionnaire
EPDS	Edinburgh Post Natal Depression Scale	USPSTF	United States Preventive Services Task Force
HP2020	Healthy People 2020	WHO	World Health Organization
PCP	Primary Care Physician		

Appendix A



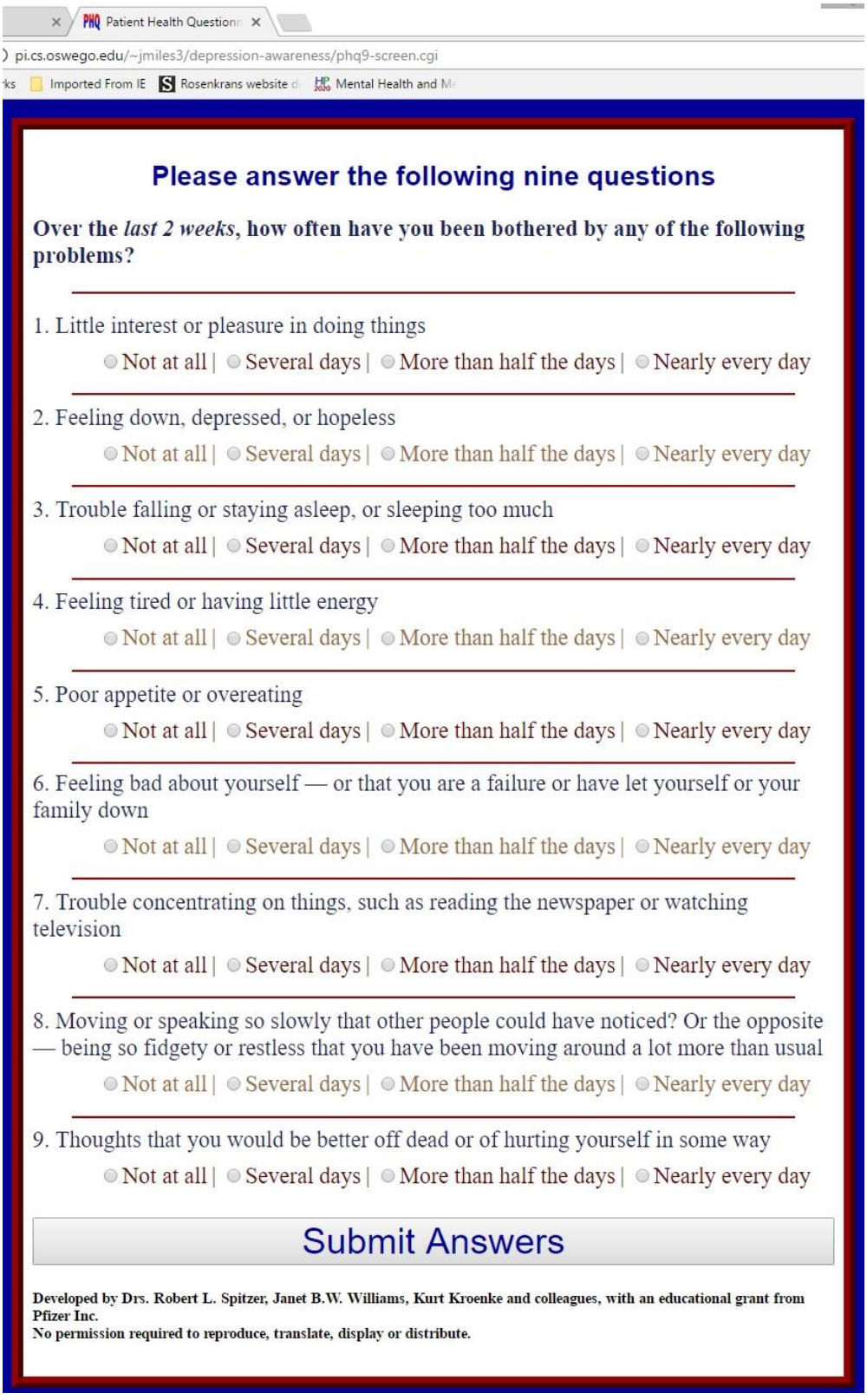
Two question screening examination based on PHQ-2

Answering “No” to both questions indicates a very low chance for depression and will inform the patient that the assessment is concluded with results being forwarded to the specified doctor.



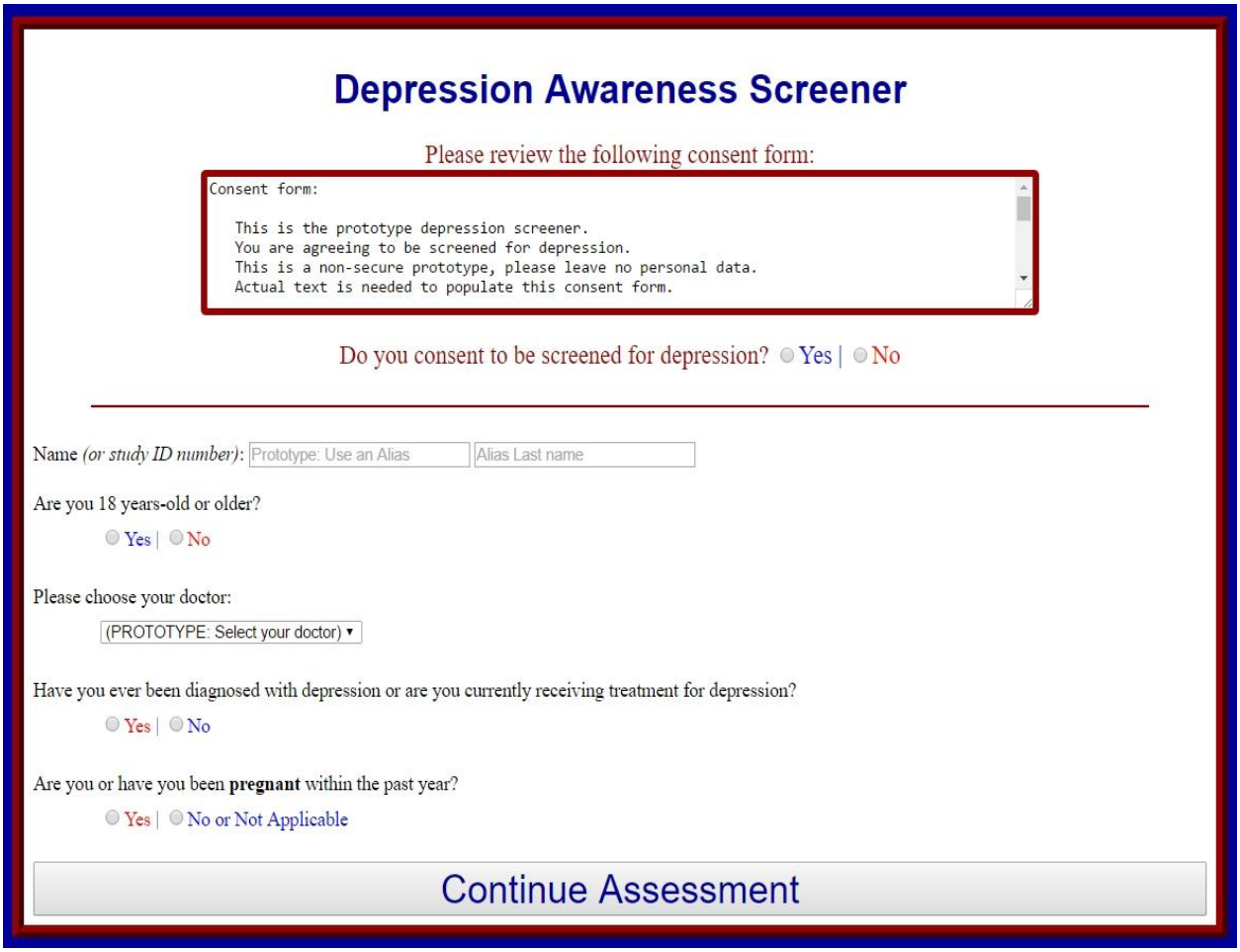
Answering “Yes” to either or both questions will lead the patient to the PHQ-9 assessment as seen in appendix B.

Appendix B



PHQ-9 assessment, results forwarded to the specified doctor.

Appendix C



Prototype consent form. This is the initial screen for the "Depression Awareness Screener" (http://pi.cs.oswego.edu/~jmiles3/depression-awareness/).

Answers that are colored blue are for prototype purposes to show the only path of answers to proceed to the PHQ screening questions as seen in appendix A.

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"Depression Awareness Screener," program written by Dr. Joseph Miles. Screening questions from PHQ-9 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.)