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Rate of positive depression screenings among Marshallese patients with diabetes in Northwest Arkansas

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Abstract

Introduction: The lifetime risk of developing depression is 16.6%, however the risk is 2-fold in patients with diabetes. The rate of diabetes is much higher for the Marshallese than the general US population, with a prevalence ranging from 25% to 50%, however the prevalence of depression is not well defined among this minority group. The primary objective of this study was to obtain the rate of positive depression screenings, using the Patient Health Questionnaire-2 (PHQ-2), among adult Marshallese patients with diabetes.

Methods: A retrospective chart review was performed for Marshallese adults receiving care in a student-led clinic in Northwest Arkansas. Marshallese adults with a documented PHQ-2 score and a diagnosis of type 1 or 2 diabetes, as outlined by the American Diabetes Association, were included. Demographic information was obtained from the medical records. The data were analyzed using descriptive statistics.

Results: The study included 96 patients. Ten patients scored a 3 or higher on the PHQ-2, indicating a positive screen. Of these, scores ranged from 3 to 6, with the majority of patients scoring 4 (N = 6). The average hemoglobin A1C for patients with a positive PHQ-2 score was 10.5%.

Discussion: This project identified a rate of 10.4% of patients with a positive PHQ-2 from the study sample. This finding is similar to the prevalence of depression for the general US population, however it is lower than rates cited in the literature for patients diagnosed with diabetes. Future studies should use Native Marshallese community health workers and focus groups to develop a multistep approach to obtain a culturally appropriate, translated tool with high sensitivity for patient response.

Keywords: student-led clinic, depression, Marshallese, patient health questionnaire, diabetes, Pacific Islander, minority health

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Introduction

The annual prevalence of major depressive disorder (MDD) among adults in the United States is 6.7%.[1] The lifetime risk of developing depression is 16.6%, however the risk is 2-fold in patients with diabetes.[2,3] Having a diagnosis of diabetes appears to be a risk factor for developing depression. This correlation may be related to poor adherence to diabetes care, which can result in

Over the past 2 weeks, how often have you been bothered by any of the following problems?	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
Scoring + + + = Total score				

FIGURE: Patient Health Questionnaire-2 (Developed by Kroenke et al[8] with an education grant from Pfizer, Inc. No permission required to reproduce, translate, display or distribute)

higher rates of complications and mortality.[4,5] The American Diabetes Association (ADA)[6] recommends screening yearly for depression in patients with diabetes using validated and appropriate measures. Furthermore, the US Preventive Services Task Force recommends screening for depression in the general adult population.[7]

The Patient Health Questionnaire-2 (PHQ-2) is a tool that investigates the frequency of depressed mood and lack of interest over the previous 2 weeks (Figure). The purpose of the PHQ-2 is not to establish diagnosis or monitor depression severity but to screen for depression in a *first step* approach. The PHQ-2 has a score ranging from 0 to 6, with each score reflecting the probability of having MDD (Table 1). A score of 3 has been identified as the optimal cut point for screening purposes, based on a sensitivity of 83% and a specificity of 90% for detecting MDD. For patients screening positive with a score of $\geq$3, it is recommended they be further evaluated with the PHQ-9 to determine the presence of criteria for depressive disorder.[8]

Depression screening is routinely used at the North Street Clinic at the University of Arkansas for Medical Sciences Northwest Campus in Fayetteville, Arkansas. This is a charitable clinic led by medical, pharmacy, nursing, and physical therapy students, which was established to provide care for uninsured, Marshallese patients. The majority of patients are non-English speaking, therefore the clinic incorporates bilingual Marshallese community health workers (CHWs) as part of the care team. Arkansas has the largest population of Marshallese people in the continental United States.[9,10] Historically, the Republic of the Marshall Islands was a site for the US nuclear testing program.[11] Currently, the Republic of the Marshall Islands is an independent nation but has a Compact of Free Association with the United States, allowing Marshallese to travel, reside, and work in the United States without a visa.[12] As a result of the Compact of Free Association, the US Substance Abuse and Mental Health Administration is able to report annual mental health data for the Marshall Islands, although this data is limited.[13]

TABLE 1: Patient Health Questionnaire-2 (PHQ-2) score interpretation[a]

PHQ-2 Score	Probability of Major Depressive Disorder, %	Probability of Any Depressive Disorder, %
1	15.4	36.9
2	21.2	48.3
3	38.4	75.0
4	45.5	81.2
5	56.4	84.6
6	78.6	92.9

[a]Table 1 was modified from psychometric properties reported by Kroenke et al.[8]

Significant health disparities exist among the Marshallese.[14-17] The rate of diabetes is much higher than the general US population, with a prevalence ranging from 25% to 50%.[15] The prevalence of depression is not well defined among the Marshallese.[18] Major depressive disorder has been cited as the largest contributor of disability in the Pacific region.[19] A recent study[20] using national estimates from the Native Hawaiian and Pacific Islander population identified diabetes as a predictor of psychological distress. Findings indicated that adults with diabetes had 4.5 times greater likelihood of experiencing high or very high levels of psychological distress. Furthermore, nearly 1 in 5 adults experienced high or very high levels of psychological distress, placing them at a greater risk for having mental health disorders, such as depression and anxiety.[20]

All patients in the North Street Clinic are administered the PHQ-2 annually to screen for depression. The primary objective of this study was to obtain the rate of positive depression screenings using the PHQ-2 among Marshallese adults with diabetes.

TABLE 2: Patient characteristics

Patient Characteristic	N (%) or Mean ± SD
Sex, female	60 (62.5)
Age, y	54.0 ± 11.0
HbA1c, %[a]	9.3
Weight, lbs	170.9 ± 33.0
Glucose, mg/dL	239.6 ± 99.5
Time since diabetes diagnosis, y	5.3 ± 8.5

[a]The cut-off value for hemoglobin A1C (HbA1c) was 14 per point-of-care testing, however several participants had values listed as >14. These were defined as 14 in order to calculate the mean HbA1c.

TABLE 3: Study participants PHQ-2 scores

PHQ-2	N (%)
0	57 (59.3)
1	18 (18.8)
2	11 (11.5)
3	1 (1.0)
4	6 (6.3)
5	1 (1.0)
6	2 (2.1)

Methods

A single center, retrospective chart review was performed at the North Street Clinic in Fayetteville, Arkansas, from February 1, 2017, to September 8, 2017. Marshallese patients 18 years and older with a documented PHQ-2 score and diagnosis of type 1 or 2 diabetes, as outlined by the ADA, were included in the chart review. Patients with gestational diabetes and those with incomplete chart information were excluded.

Data collected from the medical records included sex, age, weight, years since diabetes diagnosis, hemoglobin A1C (HbA1c), most recent glucose reading, and PHQ-2 score.

This study was reviewed and determined exempt from review by the University of Arkansas for Medical Sciences Institutional Review Board (#206866). Data were entered into Excel (2013 edition; Microsoft, Redmond, WA), and descriptive statistics were obtained.

Results

The study included 96 patients. Baseline characteristics are presented in Table 2. The majority of patients were female with an average age of 54 years, HbA1c of 9.3%, and an average of 5.3 years since diabetes diagnosis (as reported by 71 included patients). The PHQ-2 scores are summarized in Table 3. Ten patients (10.4%) screened positive for depressive symptoms using the PHQ-2 tool, with a majority of these patients scoring 4 (N = 6). Patients with a negative screen (N = 86, 89.6%) primarily scored 0 (N = 57). The average HbA1c for patients with a positive PHQ-2 score was 10.5% with only 1 participant demonstrating a HbA1c at goal <7% according to the ADA at time of depression screening.[21]

Discussion

The primary objective of this study was to obtain the rate of positive depression screenings using the PHQ-2 among adult Marshallese patients with diabetes. The US Preventive Services Task Force recommendations for depression screening do not recommend one specific screening tool. Primary care providers have previously been encouraged to use the most feasible tool for their practice setting and patients.[22] The PHQ-2 instrument is used at the North Street Clinic because of its brevity, allowing for easier verbal translation by CHWs to the Marshallese patients. Using a cut-off score of ≥3, the rate of positive screenings was 10.4% in our study population. This is similar to the prevalence of depression diagnosis for the general US population; however it is lower than rates cited in the literature for patients diagnosed with diabetes.[3] When using a cut-off score of 2 for the PHQ-2, Kroenke and colleagues[8] identified an enhanced sensitivity of 92.7% and decreased specificity of 73.7% for predicting MDD diagnosis. Using a cut-off score of 2 would have increased the rate of positive depression screens in our patient population to 21.8% (N = 21). This is more consistent with the increased depression rates among patients with diabetes but would have increased the likelihood of false positive results. The North Street Clinic remains consistent with use of the optimal cut-off score of 3 in practice.[8]

Cultural influences may have led to different responses among our study population compared to the general US population. Cross-cultural considerations and associated challenges with depression screening tools have been highlighted in other ethnic populations.[23,24] Mental health care in the United States is heavily influenced by western science and medicine, whereas the Marshallese have a culture rich in traditional beliefs[14] (T.A.D., unpublished data, 2018). Historical accounts of the Marshallese depict mental illnesses as being attributed to supernatural causes from curses and black magic.[14,25] Additionally, these accounts describe their emotions being tied to the throat, compared to what is commonly accepted in the western society as emotions related to the heart.[25] The difference in understanding and interpreting symptoms may have contributed to underreporting of depressive symptoms in the Marshallese patients included in this study.

Although mental health literature is sparse for the Marshallese, prior anecdotal reports from the Republic of the Marshall Islands suggest depression and alcohol abuse are common.[13] A review of suicides in the Marshall Islands identified a commonality of alcohol and other illicit substance use at the time of the incident.[13] From 1991 to 1995, the percent of alcohol-related suicides in the Marshall Islands averaged 68% but were as high as 83%, which is significantly higher than the general US population.[26,27] The association between substance use and suicide in addition to underreporting of depressive symptoms, stigma, and beliefs may have significant implications for the Marshallese population.

This is the first study the authors are aware of to examine the rate of positive depression screening among Marshallese adults with diabetes in one clinic setting, however it is not without limitations. When administered, PHQ-2 questions are translated verbally from English to Marshallese by CHWs. Clinic practitioners and the study authors have not found a Marshallese version of this screening instrument. Students participating in the clinic have been trained on administration of the PHQ-2 by a board-certified psychiatric pharmacist, but the CHWs have not been trained on administration of this instrument. This may have resulted in CHWs misinterpreting questions or misunderstanding the purpose of the PHQ-2. The influence of language may have been a contributing factor in the low rate of positive depression screening among study patients. Subtle differences in the verbally translated questionnaire may have caused variations in interpretation of items or responses, leading to inaccurate scores. Additional limitations include underestimation of HbA1c mean values, missing data noted from charts after review was completed, and a small sample size. Another notable limitation may be the comparison of positive depression screening using the PHQ-2 to the actual prevalence of established depression diagnosis in the general population. The well-established sensitivity and specificity of the PHQ-2 was felt to be sufficient to predict the diagnosis of MDD as the selected cut-off score.

Given the small sample size and rate of positive depression screening reported in this study, future research should explore culturally-appropriate depression screening and assessment tools for use in the Marshallese. An ideal initial step may include consideration of qualitative research and open communication with CHWs and community stakeholders to discuss the best way to screen for and assess depression in the Marshallese. A new, invalidated depression screening tool may be more appropriate for this population. Future studies may include development of a new or translated tool and should also examine if written translation is more effective than verbal translation of the tool. This tool may help promote sensitivity for the patient and decrease stigma associated with the questions being asked. Once an effective tool is created or identified, future studies should evaluate whether interventions to control diabetes or reduce associated symptoms among Marshallese adults may alleviate psychiatric symptomology and collectively improve Marshallese mental health.

Conclusion

Using the PHQ-2, 10.4% of Marshallese patients with concomitant diabetes in a small clinic setting were identified as having a positive depression screening. Future research related to mental health screening is needed within the Marshallese population to benefit the community as a whole. It is imperative to use CHWs and stakeholders to assist with the development of a multistep approach to obtain a culturally appropriate, translated tool with high sensitivity for patient response.

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