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Factors Associated with Depression Detection in a New Hampshire Mental Health Outreach Program

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Abstract

Objectives—For mental health outreach programs serving older adults, accurately detecting depression is a necessary component of quality service provision. Multiple factors, including gender, cognitive impairment, comorbid anxiety, or recent bereavement may affect depression detection, but this is under-studied in mental health outreach programs. Therefore, we sought to both establish rates of depressive symptom detection and to examine factors associated with inaccuracies of detecting depression among participants in a mental health outreach program serving older adults.

Method—We conducted a chart review of 1,126 cases in an older adult-focused mental health outreach program in New Hampshire, the Referral Education Assistance & Prevention (REAP) program. Accuracy of depression detection was identified by comparing screen-positive scores for depressive symptoms on the 15-item Geriatric Depression Scale (GDS) to depression identification by counselors on a “presenting concerns” list.

Results—Inaccurate depression detection (positive on the GDS but depression not identified by counselors) occurred in 27.6% of cases. Multivariate regression analyses indicated that anxiety, cognitive concerns, and rurality were all associated with inaccuracy of detection.

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Conclusion—This study appears to be the first to examine factors influencing depression detection in a mental health outreach program. Future training programs and other efforts should help ensure that all older mental health outreach clients have depression detected at optimal rates.

Keywords

depression; detection; mental health outreach; rural

INTRODUCTION

Symptoms of depression affect about 25% of adults age 65 and over (Substance Abuse and Mental Health Services Administration, 2011). Yet older adults with depressive symptoms are unlikely to seek out mental health services (Mackenzie, Scott, & Mather, 2008) for a range of reasons including low perceived need, low awareness of treatment options, and stigma (Corrigan, 2004; Pepin, Segal, & Coolidge, 2009; Sirey et al., 2001). Use of mental health care for depression is even more limited for older adults in more rural areas, in part due to lack of transportation and local resources (Bartels, 2003).

In response, mental health outreach programs have sought to increase access to depression services for older adults living in more rural areas (Pepin, Hoyt, Karatzas, & Bartels, 2014). The goal of outreach is to engage hard-to-reach, at-risk older adults who might not otherwise be screened or referred for mental health concerns. Mental health outreach is often focused on screening to identify untreated or undertreated psychiatric symptoms and referring to mental health services in specialty and/or primary care. Mental health outreach may also include education about common conditions and treatment methods for at-risk older adults, interventions to prepare people for treatment, or brief individual and family therapy to alleviate symptoms (Pepin et al., 2014; Sirey, Bruce, & Alexopoulos, 2005).

For mental health outreach programs, accurately detecting depressive symptoms, including their duration and any exclusion criteria, is a necessary part of quality care provision, because program goals are focused on identifying mental health concerns and linking to appropriate interventions. Evidence-based interventions delivered to those who need them can, in turn, potentially reduce the intensity and duration of symptoms (Alexopoulos, 2005). Accurate detection can also help ensure that limited mental health resources are provided to those who would most benefit from them (Fromm, Schlager, Steneker, & Jaffe, 1993).

Yet depression is often inaccurately detected among many types of providers working with older adults (Stek et al., 2004). While there is a lack of clear data from mental health outreach programs, the rate of underdetection of depression in older primary care patients ranges from 25% to 50% (Olfson et al., 1996; Sturm & Wells, 1995; Stek et al., 2004). Often, older adults or providers attribute symptoms to other causes, such as normal aging, medical morbidity, or disability (Fromm et al., 1993). Other factors affecting depression detection in primary care include low provider confidence in ability to diagnose depression and insufficient knowledge and training to diagnose depression (Olson et al., 2002). Beliefs that depression is an understandable reaction to social and health problems, or that older people do not want to talk about their feelings, can also limit depression recognition (Smith, Haedtke, & Shibley, 2015). Moreover, older adults are often unwilling to disclose depressive

symptoms because of stigma (Corrigan, 2004; Sirey et al., 2001). The presence of cognitive impairment (Stack, 1982), male gender (Garrard et al., 1998), Black race (Wagner et al., 2007), lower depressive symptom severity (Gregg, Fiske, & Gatz, 2013; Cepoiu et al., 2007), high comorbidity of other illnesses, lack of history of depression, and lack of prior antidepressant use (Cepoiu et al., 2007) have also been associated with poorer depression detection by providers.

However, there does not appear to be any existing research that examines factors affecting depression detection among older adults living in the community by mental health outreach workers. Therefore, the purpose of this study is to both establish rates of depressive symptom detection and to examine factors associated with inaccuracies of detecting depression by providers in the Referral Education Assistance & Prevention (REAP) program, a mental health outreach program serving older adults throughout New Hampshire. Understanding more about what affects depression detection in older adults may inform efforts to improve service provision in mental health outreach programs.

METHODS

Initiated in 1992, the New Hampshire Referral Education Assistance & Prevention (REAP) program was designed to identify older adults at risk for mental health and substance misuse conditions and to link older adults to specialty services throughout the state. New Hampshire has a disproportionately greater population of adults age 65 and older than other states, and growth in older adult populations in rural regions is more rapid than in urban regions of the state (Johnson & Durham, 2012). The REAP program is specifically tailored to address the needs of older adults at risk for mental health concerns and/or at-risk drinking living in both rural and non-rural parts of the state.

REAP services are available free-of-charge to adults ages 60 years or older, residents living in senior housing who are younger than age 60, and caregivers of older adults. REAP clients are offered five free sessions annually. REAP accepts referrals for counseling sessions from medical providers, mental health providers, resource coordinators who assess service eligibility, and community members. During assessment, the REAP counselor screens for depressive symptoms, at-risk alcohol use, and cognitive impairment; identifies risk factors; identifies protective factors; and collaboratively develops participant goals. Subsequent sessions are focused on providing education (*i.e.*, about depressive symptoms, medications, at-risk alcohol use), supportive counseling, and assisting with care coordination. REAP counselors also typically provide referrals to services such as mental health, primary care, specialty care, housing, financial management, as needed (Pepin et al., 2014). During the time period analyzed, there were about forty REAP counselors across the state, and all held either bachelors or masters degrees. Data on clients was collected as part of standard clinical practice. The sharing of de-identified clinical data and the proposed analyses were reviewed and approved both by the Dartmouth College and the Hunter College Institutional Review Boards.

Data Collection

Authors (AG and RP) abstracted de-identified participant counseling data directly from the REAP reporting website. Data was reviewed for all clients who accessed REAP services from January, 2010 to December, 2012, a total of 1,126 adults. All variables were analyzed as they had been entered into the REAP reporting website, except for bereavement experiences, which were coded by the authors. To increase reliability, both authors came to consensus on any coding discrepancies through discussion, so that interrater reliability was ultimately 1.0. In considering factors that might be associated with depression detection, we focused on variables available in the REAP reporting website that either been identified in previous literature as associated with depression detection (such as cognitive impairment (Stack, 1982) and being male (Garrard et al., 1998)) or variables that, in the clinical experience of the authors in depression assessment, seemed like they could potentially influence depression detection (such as anxiety severity). Variables analyzed were:

Participant characteristics—Demographic characteristics, including age category, gender, ethnicity, were collected and entered into the reporting website by REAP counselors.

Rural status—Each client was characterized as being in a “rural” or “non-rural” region by examining which REAP site they were served by. Based on 2010 Census classifications (United States Census Bureau, 2016), clients served by REAP sites that were in regions with population less than 50,000 people were categorized as “rural,” while clients served by REAP sites in populations of 50,000 or greater were categorized as “non-rural”

Depressive symptoms—Depressive symptoms were measured with the Short Form Geriatric Depression Scale (GDS), a screening instrument designed to detect depressive symptoms in older adults, available in many versions, including thirty- and fifteen-item versions (Yesavage & Sheikh, 1986). REAP utilizes the fifteen-item version (the GDS-15); a score greater than or equal to six indicates clinically significant levels of depressive symptomatology (Yesavage & Sheikh, 1986). Responses to the GDS-15 have been found to be reliable and valid in samples of older adults. A systematic review found that the GDS-15 had a sensitivity 0.805 and a specificity of 0.750 (Wancata et al., 2006), and a review of 338 research studies that had used the GDS indicated that the average score reliability across studies was .8482 (Kieffer & Reese, 2002). Another study of the GDS-15 in older home care patients found that accuracy of the GDS-15 did not vary by sociodemographic factors (Marc, Raue, & Bruce, 2008). The GDS has also been found to show high correlation with other common depression measures (Sheikh & Yesavage, 1986; Yesavage & Sheikh, 1986). Internal consistency of the GDS-15, as measured by Cronbach’s alpha, has been found to be 0.80, intraclass coefficient of test-retest reliability over 2 weeks to be 0.83 and inter-rater reliability to be 0.94 (Nyunt et al., 2009). REAP counselors administered the GDS to participants.

Presenting Concern—Presenting concerns are the main reasons a client is connected with REAP. Concerns were assessed in the initial session by REAP counselors based on their clinical judgment during assessment sessions with the client. Counselors then noted in the electronic record whether each of 20 different possible presenting concerns were present

or absent. Multiple concerns can be endorsed for a single participant. Common presenting concerns included cognitive impairment, anxiety, alcohol use, depression, general health, and isolation/loneliness. We examined all presenting concerns that were endorsed in at least 10% of the sample (to allow for a large enough sample for comparisons) and which might potentially be related to accuracy of depression detection.

Bereavement—The presence of bereavement at the time of REAP intake was identified *via* chart review of notes, written by REAP counselors in the REAP reporting website after each encounter. All cases were initially searched for bereavement-related terms (e.g. “Died,” “Death” “Bereaved/ment” “Suicide” “Passed away” “Grief,” “Mourn,” “decease(d)”), and then verified by authors (RP, AG). Only death events were coded as bereavement; other types of loss (e.g. divorce, changes in health or mobility, adult children moving away) were not defined as bereavement. Deaths experienced after the initiation of REAP visits were not coded as bereavement events, as depressive symptom screening usually occurred on the first visit. A mention that the client was widowed solely as a demographic descriptor, without any mention of when, and without widowhood a focus of the visits in any way, was also not coded as bereavement.

Referral Source—REAP counselors also noted in the reporting website the source of the client referral to REAP (e.g. medical providers or hospitals, mental health professionals, self-referral, family or friends).

DATA ANALYSIS

Depression detection was identified by comparing GDS screen positive scores to whether depression was identified on the “presenting concerns” list. After conducting descriptive statistics, we explored differences in sociodemographic and clinical characteristics between those REAP clients who had depressions accurately detected and those who did not, using Chi-squares and t-tests. We then conducted multivariate logistic regression to examine which client sociodemographic or clinical characteristics remained associated with any differences in accuracy of detection. Only variables that were significant in the bivariate models were retained in the multivariate logistic regression. IBM SPSS version 22 was used to carry out analyses, $P = .05$ was the level of significance.

RESULTS

The REAP counselors administered the GDS to 69% of the participants ($n=781$). Consistent with the demographics of the entire sample, the 781 participants who were administered the GDS tended to be 65 or older ($n=621$, 79.5%), female ($n=512$, 77.6% of those with data on gender) and non-Hispanic White ($n=776$; 99.4%). Thirty-two percent ($n=247$) were from rural regions of New Hampshire and 16.4% ($n=128$) presented to REAP with bereavement. Those who received the GDS were significantly less likely to have cognitive impairment as a presenting problem than those who did not receive the GDS, but did not differ on other sociodemographic or clinical variables (results not shown).

When GDS scores were compared to depression being identified by REAP counselors on the “presenting problems” checklist, a total of 94 people (12.0% of those who received the GDS) were “true negatives” (depression was not endorsed and the GDS score was sub-threshold), while the majority 472 (60.4%) were “true positives” (depression was endorsed as a presenting problem and GDS score was above the threshold). Thirty-eight clients (4.9%) were false negatives/depression was under-detected (GDS was above threshold but depression was not endorsed as a presenting problem), and 177 (22.7%) were false positives/had depression over-detected (GDS was sub-threshold but depression was endorsed). In total, 27.6% of cases were considered to have inaccurate detection of depression and 72.5% to have accurate detection (Table 1).

Factors associated with inaccurate detection of depression in bivariate analyses (Table 2) included client age of 65 and above, client living in a rural part of New Hampshire, the presence of cognitive impairment, and the presence of anxiety (all $p < .05$). The presence of pre-entry bereavement was marginally, but not significantly, associated with more accurate detection of depression (12.6% bereaved inaccurately detected vs. 17.8% of bereaved accurately detected; $\chi^2(1) = 3.18, p < .10$). However, multivariate regression analyses (Table 3) indicated that pre-entry bereavement and age were no longer associated with accuracy of depression detection, but that the presence of anxiety, the presence of cognitive impairment, and rural setting remained significantly associated with depression detection. The R-square value for the regression was .115, and the Hosmer-Lemeshow goodness of fit test value was 16.54 ($p < .05$); both tests indicate that additional variables, not available to be included in the model, would improve model fit.

DISCUSSION

This study appears to be the first to examine factors associated with accuracy of depression detection within a mental health outreach program. The presence of cognitive impairment, not having anxiety as a presenting problem, and living in a more rural part of the state were all robustly associated with inaccurate depression detection. These findings are consistent with some previous research; one study found that inaccurate detection of depression was more common when cognitive impairment was present (Stack, 1982), though other research did not find an association between cognitive impairment and depression detection (Gregg, Fiske, & Gatz, 2013). Detection of depressive symptoms in some cases of cognitive impairment may be challenging because many clinical symptoms are similar (Wright & Persod, 2007). For example, apathy is a common clinical syndrome in persons with dementia; while this does not necessarily indicate depressive symptoms, it can limit engagement and complicate assessment. Similarly, symptoms of disorientation, difficulty concentrating, and memory loss are indicative of both cognitive decline and depression (American Psychiatric Association, 2013; Brown, Raue, & Halpert, 2015; Vieira, Brown, & Raue, 2014). As a result, a counselor might dismiss depressive symptoms in those with cognitive impairment as a symptom of cognitive decline.

Our finding of poorer detection in rural areas has not been previously identified, but may be a reflection of other factors associated with rurality, like higher stigma or fear of being put on antidepressants among clients, both of which have been associated with under reporting

of depressive symptoms and poorer depression detection (Strawbridge, Howard, Nolan, & Feller, 2008). REAP counselors who serve more rural areas of the state may also detect depression differently than other counselors, but we did not have a large enough sample size to examine this level of difference. Low provider confidence to screen has been found to be a common reason for poor detection across both primary care and in home-based providers (Vieira et al., 2014). There is also a chronic workforce shortage in geriatric mental health care, particularly in rural areas, which limits the availability of support and training opportunities (Institute of Medicine, 2013); depression detection may also be indirectly impacted by these workforce issues in rural areas.

To our knowledge, no previous work found that the presence of anxiety affected detection of depression, but clinically, work has found that greater severity of depressive symptoms does increase detection (Garrard et al., 1998) and depression and anxiety often co-occur (Kessler et al., 2003). Future efforts could seek to understand factors affecting depression detection in those with anxiety. Previous work also found that men were less likely to have depression detected than women (Garrard et al., 1998), a finding not replicated in our sample, perhaps due to differences in the population under study.

While a sizable minority of REAP clients experienced bereavement, the presence of bereavement was not associated with depression detection, implying that bereavement does not mask detection of depressive symptoms, a concern of many researchers and clinicians (Wakefield, 2012). The GDS appears to be able to discriminate between sadness from a loss and sadness related to depressive symptoms. Future work might examine qualitatively the process of detecting depressive symptoms, in the presence of bereavement, in community mental health outreach workers, the acceptability of the GDS to workers in this context, and any identified barriers to its use.

We also found that many clients were not administered a depression screen. Efforts are needed to make screening of all mental health outreach clients universal, as clinical judgment alone is not sufficient. Workers appear to often rely upon a range of methods to detect depression, and protocols should be put into place to increase the frequency of screening, as well as to gather information on the duration and exclusion criteria for depression; there have been successful attempts to integrate screening into practice in outpatient clinic settings, for example (Strawbridge et al., 2008). These efforts are currently underway within the REAP program, but will require sustained monitoring and support to continue.

It is also worth noting that out of 781 older adults assessed for depressive symptoms by the GDS, only 271 (34.7%) had levels of depressive symptomatology below threshold levels. This is substantially higher than the 25% symptom-positive found in representative samples of older adults (Substance Abuse and Mental Health Services Administration, 2011; Richardson et al., 2010), but is likely a reflection of the fact that older adults are referred to REAP primarily because of mental health concerns such as depressive symptoms and substance use (Pepin et al., 2014).

The current analysis has several limitations. Not all REAP clients were administered the GDS, which may have biased findings. As noted above, we did explore factors associated with GDS administration, and found in preliminary analyses (not shown) that the presence of cognitive impairment made GDS administration significantly less likely. There may also be variation in who receives the GDS by REAP counselor and REAP site, but there was not sufficient detail available in the de-identified data reviewed to explore these questions. Moreover, the bereavement measure was created by chart review by the authors; bereavement events may have been underreported in the notes. There may be many unmeasured confounders influencing the identified associations. It should also be emphasized that the GDS indicates significant levels of depressive symptomatology (Yesavage & Sheikh, 1986), not diagnostic criteria for depression. As symptoms were not compared to any clinical assessment, there is the potential for both false negatives and false positives in our categorization of “accurate detection.”

There are also many factors that could have affected depression detection that we were unable to measure. One study found that, in a sample of younger women, being diagnosed as depressed in the past by a doctor, belief in medical/psychiatric causes of mental illness, and using the coping strategies of facing the problem, using drugs or alcohol and prayer were all associated higher recognition of depression (Alvidrez & Azocar, 1999). As noted above, stigma around depression has also been identified as common in older adults and associated with lower disclosure of symptoms and treatment seeking (Corrigan, 2004; Sirey et al., 2001), as have attribution of symptoms to other causes (Froom et al., 1993) or to normal aging (Smith et al., 2015). In addition, research has found high comorbidity of other illnesses, lack of history of depression, and lack of prior antidepressant use (Cepoiu et al., 2007) to be associated with poorer depression detection. All of these factors may have applied to REAP clients, but were not measured. Finally, participants were all service recipients from one mental health outreach program in New Hampshire, and almost all were referred for services. Results cannot be generalized to other populations of homebound older adults, to geographic regions outside New Hampshire, or to comparable mental health outreach programs. Nevertheless, this dataset includes a large sample of older adults in New Hampshire, which allows us to examine depressive symptom detection in a novel population. Many of these care recipients may be limited in their ability or willingness to participate in research studies, adding to the importance of our findings.

Services to treat depression should be easily accessible to all older adults. In general, the most positive depression outcomes are associated with consistently using depression scales, and following detection with efforts to confirm diagnosis, and then with coordinated care, treatment, and monitoring (Thota et al., 2012). Mental health outreach programs are ideally positioned and resourced to achieve these outcomes, but counselors may need additional support to detect depressive symptoms in the context of cognitive impairment and when there is not comorbid anxiety, and to detect depressive symptoms in older adults in rural areas. In-service trainings or within-visit consultations may be effective in improving detection skills in these cases. Future work could also explore in more depth both client attitudes towards help seeking for depression and REAP counselor attitudes and behaviors that might affect depression detection. In one national survey of primary care doctors, barriers such as time and low skill were identified (Olson et al., 2002); though REAP

counselors are trained to specifically address depressive symptoms, they may face similar barriers.

CONCLUSION

This study is a first step in understanding factors influencing depression detection in older adults receiving mental health outreach. While mental health outreach counselors appear able to successfully distinguish between signs of bereavement and depressive symptoms, cognitive impairment, anxiety, and rural status all appear to influence detection. Future efforts should ensure that all clients have depression detected at the optimal rate of 100%.

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Table 1

Comparison of Counselor Judgment of Depressive Symptoms as a “Presenting Concern” to Geriatric Depression Scale (GDS) Scores (N= 781)

	GDS Sub-Threshold (n, %) (n=271)	GDS Above Threshold (n, %) (n=510)
Depressive symptoms not noted as presenting concern (n, %)	94 (12.0)	38 (4.9)
Depressive symptoms noted as presenting concern (n, %)	177 (22.7)	472 (60.4)

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Table 2

Predictors of Inaccurate Detection of Depression (N= 781)

Variable	Inaccurate detection (n=215)		Accurate detection (n=566)		Test-Value (t-test or Chi-Square)
	n	%	n	%	
Age Range is 65+	182	84.7	439	77.6	4.81, p=0.028
Female	131	73.2	381	79.2	2.72, p=.099
Rural	106	49.3	141	24.9	42.87, p<.001
Referral source is family/friend	25	11.6	72	12.7	0.17, p=0.679
Referral source is medical provider/hospital	23	10.7	87	15.4	2.81, p=0.094
Referral source is mental health provider	28	13.0	50	8.8	3.04, p=0.081
Referral source is self	27	12.6	63	11.1	0.311, p=0.577
Bereaved	27	12.6	101	17.8	3.178, p=.075
Cognitive impairment is presenting problem	75	34.9	131	23.1	11.06, p=.001
Alcohol is presenting problem	35	16.3	85	15.0	0.91, p=0.662
General health is presenting problem	133	61.9	373	65.9	1.12, p=0.291
Anxiety is presenting problem	119	55.3	387	68.4	11.59, p=.001

+ p<.10

* p<.05

**

p<.01

p<.001

Table 3
 Association Between Accurate Detection of Depressive Symptoms and Sociodemographic and Clinical Factors (N=781)

Variable	B	S.E.	AOR	95% C.I.	p-value
Bereaved	.284	.243	1.328	0.825–2.137	.242
Age is 65+	-.345	.223	.708	0.458–1.096	.121
Rural	-1.067	.171	.344	0.246–0.481	.000
Anxiety is presenting concern	.450	.172	1.568	1.120–2.195	.009
Cognitive impairment is presenting concern	-.540	.183	.583	0.407–0.834	.003
Constant	1.472	.255	4.358		.000