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SCREENING OLDER ADULTS FOR DEPRESSION: THE RELATIONSHIP AMONG CLINICAL DISCIPLINE TRAINING, BARRIERS, ATTITUDES, NORMS, AND PERCEIVED BEHAVIORAL CONTROL

By

Ronald W. Smith

A Dissertation

Submitted to the Faculty of the

College of Arts and Sciences of the University of Louisville

for the Degree of

Doctor of Philosophy

in Clinical Psychology

Department of Psychological and Brain Sciences

University of Louisville

Louisville, KY

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A Dissertation Approved on

March 23, 2018

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ABSTRACT

SCREENING OLDER ADULTS FOR DEPRESSION: THE RELATIONSHIP AMONG CLINICAL DISCIPLINE TRAINING, BARRIERS, ATTITUDES, NORMS, AND PERCEIVED BEHAVIORAL CONTROL

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Purpose of the Study: The purpose of this study is examine the influence of barriers on clinicians' decisions to screen for depression in older adults or to refer to other health professionals. A second purpose is to explore how well the Theory of Planned Behavior is supported as a framework for understanding the likelihood of screening for depression and how the variables within the theory interact with barriers to affect clinician behavior. A final purpose is to explore characteristics of depression screening or referral of older adults by several clinical disciplines.

Design and Methods: This study featured a cross-sectional survey design with experimental manipulation of vignettes. A 4-way mixed ANOVA explored the effects of clinical discipline (between subjects) and time pressure, patient difficulty, and level of symptoms (within subjects) on likelihood of screening and likelihood of referral. The Theory of Planned Behavior factors attitudes, norms, and perceived behavioral control were used as potential covariates. Clinical graduate students were recruited locally and nationally to take an online survey

that presented participants with 8 vignettes which fully crossed the within-subjects factors. Vignettes were presented to each participant in a random order; respondents rated their likelihood of five clinical decisions, two of which were the dependent variables of interest.

Results: 229 graduate students in medicine (n = 83), psychology (n = 51), nursing (n = 49), and social work (n = 46) completed a clinical decision-making survey. For likelihood of screening, there were significant main effects of time pressure and level of symptoms, but no main effects of patient difficulty or clinical discipline. There was a significant 3-way interaction between discipline, patient difficulty, and symptom level that was driven by social work graduate students' greater likelihood of screening for depression when there were more symptoms present, a difference that was less prominent if the patient was being difficult than for non-difficult patients. There was also a 2-way interaction between patient difficulty and level of symptoms. Time pressure, patient difficulty, and level of symptoms all had an effect on likelihood of referral to another health professional. The clinical disciplines differed in their ratings of attitudes, norms, and perceived behavioral control of screening for depression.

Implications: The study holds implications for identifying and addressing gaps in education and training on depression and how to screen for it, as well as how to minimize the effects of potential barriers. Several interventions could be implemented addressing goals and self-efficacy of screening, time management, behavior management skills, and more effective ways of screening. The TPB

serves as a good framework for understanding the likelihood of screening, with attitudes and norms being the strongest contributors across all disciplines.

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Background and Rationale

Major Depression is a mental disorder characterized by a decrease in mood or increase in anhedonia, with symptoms including affected energy, appetite, sleep, movements, and thoughts and feelings about oneself (APA, 2013). Depression prevalence in older adults in the community and in long-term care facilities warrants appropriate detection from providing clinicians. Prevalence and incidence rates of depression with older adults will increase due to the growth of cohorts aged 65 and older in upcoming years.

Depression as a mental health issue for older adults

Depression is prevalent in older adults in the community, in primary care settings, and within long-term care settings. Recently, the National Comorbidity Survey – Replication (NCS-R) found 12-month prevalence rates of Major Depressive Disorder at 4% in 2,575 community-based adults aged 55 and older (Kessler, Birnbaum, Bromet, Hwang, Sampson, and Shahly, 2010). An older epidemiological catchment study evaluating mental illness rates and needs assessment in older adults in a population sample found depression rates in older adults at 5% in primary care, 3% in the community (though up to 15% may experience symptoms), and 15-25% in nursing homes (Robins & Regier, 1991). A review of studies found a large range between 7% and 36% for depression in

primary care (Koenig & Blazer, 1992). Single studies also found rates that fall within this range. A Netherlands primary care study found that 17% of a sample of 384 older adults had depressive disorders, while 11%-29% of the sample had depressive symptoms (Van Marwijk, Hoeksema, Hermans, Kaptein, & Mulder, 1994). A large study in the United States of 1,711 older adults in primary care who completed the CES-D at baseline and 9 months post-baseline found prevalence rates of 17.1% at baseline and 18.8% at 9 months using a cutoff score of 16 (Callahan, Hui, Nienaber, Musick, & Tierney, 1994). A 4-year secondary data analysis study of 2,558 older adults from four primary care practices found that at baseline, 14% had CES-D scores of 16 or greater. At 2-year follow-up, the prevalence of depression in the sample increased to 16% and at four years it again increased to 18% (Unützer et al., 1997).

Two studies focused on minor depression and sub-syndromal depression as separate constructs to show their prevalence. Of 846 primary care older adults in the Netherlands, one study using the GDS-15 and the PRIME-MD found that 13.7% had major depression and 10.2% had minor depression. Minor depression was defined as a score of 5 or more on the GDS-15 with a score less than 5 on the PRIME-MD (Licht-Strunk et al., 2005). The second study found that subsyndromal depression is very common in older adults in primary care. Using the Hamilton Depression Scale (HAM-D) on 224 patients, the researchers found that 6.5% had major depression, 5.2% had minor depression, and 9.9% had subsyndromal depression. Subsyndromal depression was defined as having a HAM-D score of at least 10 without meeting criteria for major or minor

depression.

Depression is also prevalent in long-term care settings. Through random sampling and assessment of 319 residents at six long-term care facilities, Teresi and colleagues (2001) compared psychiatrists' rates of depression with those of nursing home staff, including social services workers and nurses. Psychiatrists used the Hamilton scale, the Feeling Tone Questionnaire, the Cornell Scale and the SCID, and found rates of major depression at 14.4%, rates of minor depression at 16.8%, and rates of significant depressive symptomatology at 44.2%. Nursing home staff used Depression Recognition Measures and results showed that any depression was found in 19.7% of residents by social workers, 29% of residents by nurses, and 32.1% of residents by nurse aides. Results suggest that nursing home staff can recognize depression using assessments, but their rates of recognition fall below those of psychiatrists. High rates of depression were also found in 333 residents living in 14 different nursing homes in the Netherlands. Using the GDS, researchers found rates of major depression at 8.1%, minor depression at 14.1%, and subclinical depression at 24% (Jongenelis et al., 2004).

Older adults often present in primary care and long-term care with several comorbid illnesses that result in a complex presentation of symptoms, with medical illness and mental illnesses each exacerbating the symptoms of the other (Jeste et al., 1999). Depression is related to several aspects of health, with severity playing an important role. For example, Noel and colleagues (2004) found that depression severity was related to mental functioning, disability, and

quality of life. This study also controlled for sociodemographic differences and other psychological issues and found that depression severity had more of an impact than medical comorbid illnesses on those aspects of health. Depression also puts older adults at greater risk of a first-time cardiac event. Bremmer and colleagues (2006) found that depressed participants had twice the risk of such an event as those who were not depressed, as well as three times the risk of a cardiac event related specifically to loss of blood flow.

Studies analyzing patient illnesses and outcomes over time provide some insight into how depression compares to some medical illnesses in terms of excess mortality (Yaffe, Edwards, Covinsky, Lui, & Eng, 2003). Depression was found to be a risk factor for death after a heart attack (Musselman, Evans, & Nemeroff, 1998), and researchers also found that its effect on mortality is similar to that of emphysema and heart disease in older adults (Unützer, Patrick, Marmon, Simon, & Katon, 2002). A similar study found that depression was just as much a risk factor for mortality as cardiovascular disease and diabetes in older primary care patients (Gallo et al., 2005). Detecting depression is also important because of its relation to suicidality, which is also a way that depression influences mortality. Data from the Center for Disease Control and Prevention shows that men and women aged 65 and older had rates of completed suicide at 30.93 and 4.59 per 100,000 people, respectively (CDC, 2005). Conwell and colleagues (1994) found that as many as 75% of older adults who complete suicide have diagnosable depression. The behavior trends of older adults visiting health professionals will be discussed in the rationale for screening in primary

care.

Depression is costly and results in increase healthcare utilization. In 1990, Greenberg and colleagues (1993) estimated the cost of depression in the United States was $43.7 billion dollars. In 2000, the same researchers (2003) followed up their study with a new analysis and an updating of the 1990 burden numbers based on inflation. They found that in 1990, the adjusted-for-inflation economic burden of depression was $77.4 billion and in 2000 it increased to $83.1 billion. These numbers are mostly made up from direct medical costs, mortality/suicide costs, and costs from lost time in the workplace. Though these numbers are for depression overall and not specific to older adults, they show a trend in increased cost and resource utilization caused by the disorder and are meaningful when applied to the segment of the population that uses the most healthcare resources.

Older adults with depression utilize more health healthcare resources than older adults without depression. Detecting depression is necessary for providing treatment for it, and several studies show that treatment can save patient costs. When controlling for age, sex, chronic illness, and severity of depression in 2,558 Medicare recipients, Unützer and colleagues (1997) found that depression was associated with an increase in healthcare costs for older adults over 4 years. In agreement with those findings is a study that found that primary care participants who scored at least 1 on the PRIME-MD 2-question screener had more ambulatory care costs than those with no depression (Katon, Lin, Russo, & Unutzer, 2003). In a sample of 1,711 older adults aged over 60 visiting primary

care, Callahan and colleagues (1994) found those with CES-D scores above 16 were more likely to rate health poorer, have an ER visit, have more outpatient visits, and have increased outpatient healthcare costs compared to patients whose scores did not reach the CES-D depression threshold.

In summary, depression is prevalent in older adults in the community and in primary care settings, but higher rates are found in long-term care settings where the population has greater health issues and risk factors. Depression affects other physical and mental health issues and is related to suicide attempts. Depression is also costly, resulting in higher rates of healthcare utilization, especially when not treated in a timely manner.

Older adult utilization of primary care

Older adults often use their primary care doctor for both medical and mental health issues rather than seeking care from mental health professionals (Gallo, Rabins, & Iliffe, 1997; Shah, McNiece, & Majeed, 2001). Elderly patients may have biases about mental health professionals and fear the perceived stigma related to having a mental illness (Waxman, Carner, & Klein, 1984). Such stigma is also a significant predictor of treatment discontinuation in depressed older adults compared with depressed younger adults or subjects without negative views of mental illness (Sirey et al., 2001). More than half of patients being treated for major depression are cared for in primary care (Loftis & Salinsky, 2006) and it is estimated that 85% of older adults living in the community see a primary care physician at least once per year, many of them with unrecognized depression (National Institutes of Health, 1992). A study of

comorbidity burden found that older adults visit primary care at average rates of 2 visits per year for low burden, 4 visits per year for intermediate burden, and 6.5 visits per year for high burden (Starfield, Lemke, Herbert, Pavlovich, & Anderson, 2005).

Rates of older adults using specialty mental health care providers are low (Klap, Unroe, & Unützer, 2003). In 2001 to 2002, older adults made 9.8 million office visits to providers with depression as a presenting problem; 64% of those providers were primary care physicians (Harman, Veazie, & Lyness, 2006). Trends showed primary care antidepressant prescriptions increased from 1985 to 1999 (Harman, Crystal, Walkup, & Olfson, 2003), with an estimated 67% of pharmacological drugs for depression being prescribed by primary care physicians. Since the year 1999 older adult visits to psychiatrists have declined from 36% to 25% (Harman et al., 2006). Older adults only see specialist providers more than primary care physicians when they have a high comorbidity burden (Starfield et al., 2005).

Screening tool utility

In this study, screening for depression will be defined as using a standardized, validated measure or tool to assess symptoms. There are several quick, practical screeners for depression that can be utilized by any clinician. The Geriatric Depression Scale (GDS) contains 30 dichotomous items and the Center for Epidemiological Studies Depression scale (CES-D) contains 20 items rated 0-3 based on frequency of symptoms. Lyness and colleagues (1997) validated both the GDS and the CES-D with 130 older adult patients at three primary care

clinics, with scores being evaluated against a diagnostic interview using the Diagnostic and Statistical Manual of Mental Disorders, Third Edition, Revised (DSM-III-R). Sensitivity is the ability of a screener to identify those patients with the disease. The GDS (cutoff score of 10) and CES-D (cutoff score of 21) both had high sensitivities of 1.00 and 0.92, respectively. Specificity is the ability of the screener to identify those who do not have the disease. The GDS and CES-D both had high sensitivities of 0.84 and 0.87, respectively. The Positive Predictive Value (PPV) is the probability that patients who screened positive truly have the disease and the Negative Predictive Value (NPV) is the probability that patients who screened negative truly do not have the disease. The authors of this study did not report the PPV or NPV for the GDS or CES-D because the base rates for depression in the sample were around 17%. A 15-item version of the GDS with a cutoff score of 5 also yielded a sensitivity of 0.92 and a specificity of 0.81.

The Patient Health Questionnaire 9 (PHQ-9; Kroenke, Spitzer, & Williams, 2001) was validated in primary care elderly patients by Phelan and colleagues (2010) in a sample of 71 older adults from primary care practices in the Pacific Northwest. The PHQ-9 includes 9 items with a 0-3 response range indicating the frequency of the symptom in the last 2 weeks. Using the SCID as a diagnostic tool and a cutoff score of 9, the PHQ-9 yielded a sensitivity was 0.88 and specificity of 0.80. The PHQ-2, a shortened version including only the first two items, yielded a sensitivity of 0.75 and a specificity of 0.67 with a cutoff of 2. No PPV or NPV were reported, likely because the sample was small and the base rate of major depression was 13% and the base rate of minor depression was

12%. In summary, there are validated tools for depression in the elderly for use in primary care settings. However, due to sampling issues influencing base rates, more research is needed on accurate predictive values. More research is also necessary on the safety, acceptability, and use with different cultures of these screeners for use in the elderly. It is unclear to what extent these screeners are used by disciplines other than medicine or in settings other than primary care.

Existing research on screening in primary care

The conceptual model proposed by Callahan and colleagues (1996) for treating late-life depression is pictured below (Figure 1).

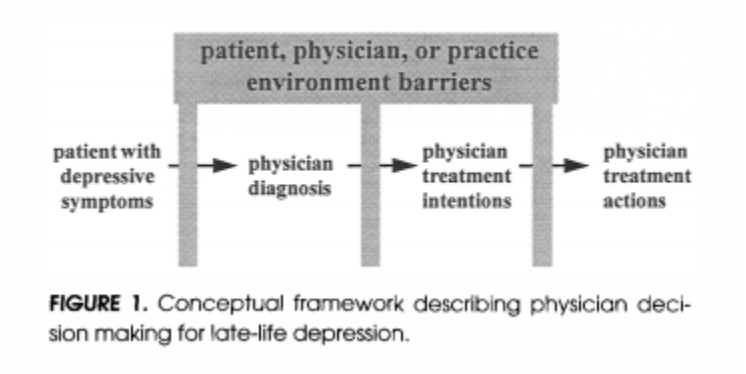


FIGURE 1. Conceptual framework describing physician decision making for late-life depression.

Screening would take place between the *patient with depressive symptoms* and *physician diagnosis* phase of the model, and a positive outcome would theoretically influence the *physician treatment intentions* and *physician treatment actions.* The literature evaluating screening effectiveness for depression will be examined for evidence of how screening is judged to be effective and where screening has an effect.

In 2009, the U.S. Preventive Services Task Force (USPSTF) reviewed evidence for or against screening for depression in primary care and concluded

with a grade B that depression screening for adults should only occur “when staff-assisted depression care supports are in place to assure accurate diagnosis, effective treatment, and follow-up.” Without these supports in place, the recommendation grade for screening decreases to C (O’Connor, Whitlock, Beil, & Gaynes, 2009; U.S. Preventive Services Task Force, 2009). The B recommendation is the same grade given in 2002 (Pignone et al., 2002), with which the Canadian Task Force agreed (MacMillan et al., 2005). These grades come as a result of research that included studies including both adults and older adults in the samples, but for the purpose of this review only the literature on older adults is relevant.

In an all-male study taking place at a Veterans Administration primary care office, Magruder-Habib and colleagues (1990) created an intervention to provide certain physicians with feedback from results of the Zung Self-rating Depression Scale (SDS; cutoff score 50) for 100 patients with previously unrecognized depression. Control group physicians got no feedback. The patients went through a double screening with the SDS and DSM-III criteria as well to reduce false positives and ensure that the randomized blocks of patients had depression. Feedback was in the form of a pink note placed at the front of the patients’ charts. The patients were followed for 12 months and completed a follow-up SDS at 1.5, 3, 6, 9 and 12 months post-baseline. One of the measured outcomes was depression detection, which was determined by the physician writing a chart note, a note mentioning symptoms (but not depression), or a referral to a mental health professional. The other outcome, treatment, was measured by a written

prescription, mental health consultation, mental health clinic visit, or counseling by the physician. Results showed that most significant difference between the two groups occurred in terms of detection at baseline, with 33% of the feedback group and 11% of the no feedback group having their depression recognized by any of the three standards for detection. The feedback group had significantly higher rates of detection at each follow-up point throughout the 12 month study. Treatment outcomes also showed the intervention as effective, with 27% of the feedback group receiving treatment compared to 3.8% of the no feedback group. By 12 months, 56.2% of the feedback group had been treated and 42.3% of the no feedback group had been treated, suggesting that the natural course of depression was unchanged by the intervention. This study provides some evidence that simple feedback of depression screening results can be effective in slightly increasing physician detection and treatment behaviors. The strengths of this study are the randomization of patients to conditions, use of a control group, and physician and patient blindness to study purpose.

Another feedback-based randomized controlled trial (RCT) by Callahan and colleagues (1994) included 175 patients older than 60 who scored 16 or greater on the CES-D. Those patients then completed the Hamilton Depression Rating Scale (HAM-D) to exclude false positives. Those patients scoring above 15 were invited to the trial, which included completing the Sickness Impact Profile (SIP) and being randomized to an intervention or control group. The study intervention then extended beyond simple feedback. The physicians in the intervention group (n = 100 patients) received a letter with a patient's score on

the HAM-D, specific treatment guidelines for that patient, current medications, previous HAM-D scores, and an educational flyer about depression. Three new visits with the patient were booked to take place within three months to address the symptoms of depression, and the letter with information was given to the physician before each visit. The study goals were to get physicians in this group to diagnose and educate the patient, eliminate current medications that exacerbated depression symptoms, initiate appropriate antidepressants, and consider referral to psychiatry. Outcomes included the frequency of each of these behaviors, along with HAM-D and SIP scores at 6 and 9 months. The physicians in the control group received no feedback and no extra visits with patients.

Results showed that at 6 months, intervention patients were more likely to have a depression diagnosis and were more likely to have started on an antidepressant. There was no difference between groups in having a drug discontinued or being referred to psychiatry. Though both groups improved, there was little difference between the intervention and control group HAM-D scores at 6 months. The authors attributed this to some patients in the intervention group being untreated, some patients in the control group being treated, a lack of psychosocial treatments offered, and patients' having more comorbidities than a typical treatment trial sample. The study strengths were randomization, organization of over 103 physicians, and the realistic medical comorbidities in the sample. The study is limited by its medical approach to treatment and its oversampling of undereducated, low income, African American women, which could make the results less generalizable. Though the intervention extended

beyond simple feedback of screening results, it did address physician fears of treating depression in older adults and provided evidence of increased diagnosis and antidepressant prescribing.

A RCT by Williams and colleagues (1999) randomized 969 patients of 4 different medical clinics to groups with different variations of depression screening to see how they were then cared for. The notable difference in this study is that the physician was present for the screening and not simply informed of the result or told how to treat depression. The groups were those receiving a single question, “Have you felt depressed or sad much of the time in the past year?,” those receiving the CES-D, or usual care. After screening, each patient went through a DSM-III-R clinical interview. The two screening groups were compared on their ability to case-find against the DSM diagnoses. Both screeners had acceptable sensitivity, but the single question had significantly poorer specificity than the CES-D.

The two screening groups were combined and rates of detection and treatment were compared to the usual care group. The screening groups had higher rates of depression identified than the usual care group (39% vs. 29%), and patients with major depression specifically were more likely to be recognized than patients with minor depression or dysthymia. The groups did not differ on physician counseling, drug treatment, or referral treatment. After 3 months, the prevalence of depression was similar in the two groups as well. In a long-term analysis where the DSM-III-R was administered again 6 months later, the screening group patients were more likely to have recovered from depression

than the usual care patients. Physicians and patients both reported high satisfaction with the screening tools. This study provides evidence that screening conducted by physicians can result in better recognition of depression without being a burden. A major strength of this study is the inclusion of a non-screened, usual care group. It provides a true picture of what happens to controls without screening where most studies have screened all participants and then randomized them into groups.

A study with a more complicated design featuring more intervention groups also utilized unscreened patients (Linn & Yager, 1980). 150 patients at an ambulatory care clinic were randomized to 5 treatment groups or 1 control group. Group 1 patients were screened with the SDS, feedback of scores and norms were entered into the chart pre-visit, and the physician was asked to rate how the patient was feeling on a 10-rung ladder scale from extremely happy to extremely sad [screened, feedback previsit, rated patient mood]. Group 2 patients were screened with the SDS, feedback of scores and norms were put in the chart post-visit (but pre-note writing), and the physician rated how the patient was feeling [screened, feedback post-visit, rated patient mood]. Group 3 patients were screened, feedback of scores and norms were given pre-visit, but the physician was not asked to rate how the patient was feeling [screened, feedback given pre-visit, no mood rating]. Group 4 was screened with the SDS, however, feedback of scores and norms were not given until after the encounter ended and the physician did not rate how the patient was feeling [screened, feedback post-visit, no mood rating]. Group 5 was unscreened but the physician rated how the

patient was feeling [unscreened, mood rated]. Group 6 was the control patients, meaning no screening and no mood rating. Within 2 weeks after the visit, charts were audited to see what notation about the patient's moods had been performed. Results showed that screened groups (1-4) had significantly more notation than unscreened groups (5-6). There was no difference in notation when comparing groups that used sensitization (physician rating the patient mood) with those that did not. Feedback before or after a visit also had no effect on notation. Depression severity was highly associated with notation. The physicians in the intervention group were 3 times more likely than physicians in the control group to recognize depression, but still only recognized 19% of the cases. Also concerning was the result that only 12% of patients from both groups received any forms of treatment for their depression. Splitting the patients into so many different treatment groups was conceptually sound but resulted in limited power for analyses. There were also further analyses that could have been included, for example, how the physicians fared at rating depression with or without screening feedback. It is also unclear what the purpose of the sensitization to depression was, or how getting physicians to rate the patient's mood made them sensitive to it (and thus more likely to note it).

Studies with less rigorous methods also evaluated the effectiveness of screening for depression in the elderly in primary care. Another feedback-based cross-sectional study by Miller and colleagues (1990) screened 183 outpatients aged over 70 for depression using the GDS and cognitive impairment using the MMSE. The goal of the study was to show that these screenings could be done

in a reasonable amount of time (4 minutes each), with a note left in the chart informing the medical resident of positive scores. Medical residents noted and addressed the previously unrecognized illness in 30% of patients with cognitive impairment and 33% of patients with depression. This study presents moderate evidence that screenings can detect depression and cognitive impairment, but weak evidence that physicians use the screening result well because of its informal intervention and lack of control group. The feedback studies analyzed here do not have measures in place to ensure that feedback of depression screening was read by the physician, but the use of a control group allows for the assumption that change in outcomes is related to the intervention.

Other studies featuring similar interventions found different results. Callahan and colleagues (1996) further investigated recognition of the depression as the main barrier in primary care physicians' treatment of depression in older adults. 111 physicians were assigned to either intervention or control groups. Of the 222 patients who screened positively for depression, 127 patients went in the experimental group where their physicians received their scores and specific treatment guidelines; 94 patients were placed in the control group for which physicians received no scores. After the visit, physicians were specifically asked about their clinic assessment of the patient's depressive symptoms. Control physicians were asked one question about the likely percentage that this patient had depression, and one question about how severe the depression was from 0 to 10. The final three questions were off topic and masked the intent of the study. The physicians in the intervention group got the

same questions plus three more questions since they also saw their patients' HAM-D scores and saw treatment guidelines. The additional three questions asked about the percentage likelihood that the patient would respond to therapy, which treatments would be indicated at this time, and how difficult it was to convince the patient of the treatment. Patients were followed for 6 months and recognition, intent to treat, or treatment action were recorded.

Results showed that physicians in both groups recognized the depression at similar rates. This is likely a result of the outcome measurement design directly asking about depression rather than reading the chart notes as previous studies had done. However, when controlling for physicians' clinical assessment, the intervention group physicians were more likely to document intentions to treat. This suggests that those physicians in the control group may not have been aware of the treatment options for depression in older adults, as they were not given guidelines for treatment. Further analysis revealed that other barriers existed such as convincing older adults to try the treatment that was recorded as intended by physicians. This study offers a design that illuminates where barriers lie in the several steps required for a physician to treat depression. The previously reviewed RCTs that found feedback increases detection may have found differences based on a physician's record keeping and not about their actual knowledge of depression symptoms existing.

Another randomized trial by Whooley and colleagues (2000) failed to show any benefits of screening when feedback was given to physicians. 331 patients who scored 6 or higher on the GDS-15 were randomized to intervention (n = 162)

and control (n = 169) groups. Physicians in the intervention group were told of the score, then told that patients who score 6-10 should be treated with educational material and counseling and patients who scored 11 or more should be referred to psychiatry. After following patients for two years, there was no difference in physician diagnosis, antidepressant prescriptions, depression prevalence, GDS-15 scores, or hospital or clinic visits. The feedback intervention was completely ineffective despite physicians in the intervention group literally being told what actions should be taken.

Finally, a review evaluated studies that used depression screening alone to affect change in diagnosis and outcome. The study did not focus on older adults and also included patients in hospitals, but the review found no evidence that screening alone was an effective intervention (Gilbody, House, & Sheldon, 2005). This latter group of studies judged depression screening based on similar outcomes of recognition, diagnosis, and treatment, but found screening to be ineffective based on those outcomes.

In summary, depression screening recommendations have stemmed from research using interventions consisting of feedback of scores to physicians, information on interpreting the score, and education-based information or guidelines on how to proceed when a score is positive. Research studies similarly found screening effective based on the behavior of the physician post-screening. Recognition/diagnosis, referral, prescribing medication, or counseling were consistent outcomes measured in these studies. Most studies also examined the duration of depressive symptoms and followed the outcomes

longitudinally, mainly to determine if screening for depression led to a resolution of the depression or symptoms. In short, the findings are equivocal. The results of the interventions on detection or recognition are mixed, and follow ups showed that any increase the intervention group held was not sustained over time. Screening feedback or interventions did not provide noticeable differences to referrals or treatments. Research has not shown depression screening with physicians to be effective in the manner it is judged as needing to be effective.

Two limitations of the physician screening literature that could account for mixed results are 1) it assumes that more clinicians will choose to screen more often if screening is shown to increase diagnosis, treatment, and referral, implying that clinicians do not screen because they do not believe screening makes a difference for these outcomes and 2) it ignores that participants in control groups who received diagnosis, treatment, or referral at similar rates in follow ups likely did so because their depression symptoms worsened. The current study takes such limitations into account by testing whether clinicians will decide to screen more often if perceived or actual barriers are removed or lessened. Patient factors that influence screening were mentioned by clinicians but the focus of the present study will remain on clinician factors.

Barriers reported by physicians

According to the model by Callahan and colleagues (1996), barriers can occur at any point throughout the depression screening process and can occur at the patient, physician, and care system levels. Barriers to screening have been examined mostly through self-report surveys of physicians. Evaluation of these

barriers could serve to improve the effectiveness of screening and will be included in suggestions for future research. Primary care physicians' attitudes toward screening and perceived barriers to screening may illuminate why the practice of screening for depression does not occur more frequently and is not more effective at increasing detection, increasing diagnosis or further assessment, or increasing treatment or reducing symptoms. In a general discussion of screening for mental illness that was not specific to older adults, Magruder (1996) raised potential issues unique to mental health screening: 1) individuals must be symptomatic because of the nature of mental illness, 2) there is social stigma of having a mental illness and fear of breach of confidentiality, 3) the patients are in different stages of change affecting treatment adherence and outcomes, 4) the public's level of understanding of mental disorders, and 5) general practitioner preparedness for dealing with those who screen positively. In a survey of attitudes and beliefs of 153 physicians working with older adults in the past year, Callahan and colleagues (1992) found that 80% of physicians felt responsible to diagnose depression but only 55% felt confident enough to do so. Furthermore, only 35% felt confident enough to prescribe antidepressants. The study separated responses of residents from faculty physicians and found that residents had more beliefs that older adults were frustrating, they were too pressed for time, and that depression in the elderly was 'understandable.' These residents were also less likely to agree that treating depression in older adults was rewarding. A review of the state of depression for older adults in primary care highlights time and a perceived negative reaction from the patient as

barriers (Scogin & Shah, 2006).

Studies assessing physician opinions generally found multiple reasons given for the difficulties of screening. Not having enough time to screen for mental illness was an issue raised in most studies, but there were some equally important secondary issues raised. In a qualitative study, physician quotes such as “that is not how you practice medicine” and “a problem would surface eventually” show that some physicians may not value providing preventive services (Solberg, Korsen, Oxman, Fischer, & Bartels, 1999). In the same study, reasons given for not screening included lack of knowledge and time, discomfort, no reimbursement, patients who are unwilling or noncompliant with treatment, and unavailability of mental health consult. A survey of physicians working with older adults revealed that 24% felt pressured with the time they had, 97% wanted increased time for a visit, and 87.8% wanted increased reimbursement for counseling (Glasser & Glavdal, 1997). While several of the physicians felt time was a factor in not screening for mental illness, there is evidence that correctly diagnosing mental health disorders is more strongly related to practice style and specialty training (Glied, 1998). A study found that when there were many topics being discussed during a primary care visit, a patient was less likely to be screened for depression (Tai-Seale et al., 2005). Finally, Loftis and Salinsky (2006) found that physicians believe that with only a short office visit available, many of the standardized, validated tools for depression are too cumbersome to administer. In summary, the barriers for screening include real or perceived deficits in communication, knowledge, resources, and attitudes on the part of the

physician, the provider, or the primary care system. One of the aims of the current study is to determine whether similar barriers are present for clinicians in disciplines other than general medicine, and to what extent the decision to screen is affected if these barriers are manipulated. No literature could be found in which barriers were manipulated to determine the effects on screening decisions. This is one manner in which the current study will contribute to the existing literature.

Moving beyond primary care physicians: Screening by other clinicians

The primary care office is the setting for a majority of screening literature, which follows the rationale that older adults visit primary care physicians most often. With older adults heavily relying on primary care providers for all health issues, it might seem logical to assume that such providers are adept at recognizing mental illness. Unfortunately, mental health issues for older adults are typically handled poorly by primary care practices in general with room for improvement in many areas (Bartels, 2002, 2003; Karlin & Fuller, 2007). Older adults with no medical illnesses presenting in primary care with symptoms that turn out to be a mental health issue result in a strain on the system (Speer & Schneider, 2003). Detection rates for mental illness vary in primary care for older adults but are consistently at or below half of the patients. Two studies found that primary care physicians detect around 50% of older adult's mental illnesses (Crawford, Prince, Menezes, & Mann, 1998; Speer & Schneider, 2003) but from there the numbers decline. In one study, only 39% (87 of 218) of depression cases were recognized (Pfaff & Almeida, 2005). When factors were analyzed that

were related to the discovery of depression, results showed that older adults who talked about taking sleeping pills, scored greater than 22 on the CES-D, and seemed suicidal were most likely to have the depression discovered. Some studies had detection rates even lower, including a study by Unützer and colleagues (2000) showing 12-25% of cases detected, a study by Mullan and colleagues (1994) finding 20% of cases detected, and a study by Tai-Seale and colleagues (2005) finding 14% of cases detected. The study by Tai-Seale and colleagues, finding the lowest rate of detection, analyzed whether detection of depression was associated with a match between the physician gender or race and the patient gender or race. No significant associations were found. Of note from these studies is the methodology used in which researchers screened existing patients then review the patients' charts to determine the number of patients that had depression mentioned in the chart notes. The results could imply physicians' poor note-taking, a general unawareness of how depression might present, or a general non-focus on mental health issues. Other studies focused on rates of physicians not detecting mental illness in primary care and found very similar results (Borgquist, Hansson, Nettelbladt, Nordström, & Lindelöw, 1993; Higgins, 1994; Jones, Badger, Ficken, Leeper, & Anderson, 1987; Ormel, Koeter, van den Brink, & van de Willige, 1991).

In a study of videotaped primary care visits, physicians only screened older adults for depression using standardized instruments in 3 of 369 meetings (< 1%) (Tai-Seale et al., 2005). In two separate studies, physicians who treat older adults completed surveys that revealed that in one sample 66% did not use

a standardized screening test at all (Glasser & Glavdal, 1997) and in the another sample only 25% routinely used a depression screening tool (Banazak, 1996). Unfortunately the prevalence of screening for mental illness in older adults is under-researched, but the studies here indicate that prevalence of screening and the use of standardized tools is low.

From the previous sections, we can conclude that older adults visit primary care practices often, that primary care physicians do not detect mental illnesses well in older adults, and that screening for mental illness using a tool in primary care is infrequent. However, these results do not translate to physicians increasing referrals of older adults to specialists. There is a sense that primary care physicians prefer not to refer patients to mental health professionals. In a mail survey of 205 physicians in North Carolina and California, only 27% responded that they would refer a depressed older patient. The physician characteristics that predicted a referral were female gender, belief that psychotherapy is effective for older adults, and use of psychosocial techniques in practice. Physicians were unlikely to refer older adults if they practiced in North Carolina, were unaware of depression treatment guidelines, or perceived older patients as unwilling to attend psychoeducational classes on depression and medication management (Alvidrez & Areán, 2002). In another study only 40% of older adults with mental illness were referred or treated (Speer & Schneider, 2003). A study that looked at primary care differences between generalist and internist practices found that general practices were more likely to offer mental health counseling or psychotherapy services (Harman et al., 2006).

Since similar data does not exist for other clinicians, it is difficult to determine whether this issue of poor recognition of mental illness is a physician-specific problem. This study will add to the current literature by studying clinicians' attitudes, norms, and confidence in screening. Nurses, psychologists, and social workers often come into contact with older adults in settings outside of primary care and have opportunities to screen for depression. Settings such as nursing homes, assisted living facilities, and hospitals are prime environments for assessment.

This study will use data collected from advanced graduate students who have had clinical experience with clients or patients. Clinical assessment is part of the curriculum for nursing, medicine, clinical and counseling psychology, and social work. These graduate programs may also feature specializations in mental health or in older adult populations. By using graduate students who also have clinical experience, this study is able to hold implications in both training and applied experience.

Applying a decision-making model

The Theory of Planned Behavior (TPB; Azjen 1988, 1991) is a decision-making model that uses three components to predict whether there is intention for an action to be taken. In the case of this study, the action or behavior is screening for depression. The components of the framework are attitudes, subjective norms, and perceived behavioral control. Attitudes consists of items measuring perceived value or worth of performing the behavior, and includes the consequences of performing the behavior. Subjective norms consist of items

measuring the social aspect of how a person believes the behavior is expected by peers or by people within a profession. Perceived behavioral control consists of items measuring whether the person believes they have the possibility to complete the behavior (Azjen, 2002). Perceived behavioral control has been shown through factor models to be composed of self-efficacy (ease of doing behavior) and controllability (the extent to which the behavior is up to the actor). Perceived self-efficacy has accounted for variance in intentions, while controllability more often predicted behavior (Cheung & Chan, 2000).

The TPB has been applied to several areas within the healthcare field, often using healthcare professionals as participants. Godin et al. (2008) found that the theory is appropriate for predicting behavior of healthcare professionals. The studies mostly used survey or semi-structured interview designs and used regression models to test the variance accounted for by the three components in predicting the target behavior.

One study that specifically addressed depression screening used the TPB to measure 98 physicians' screening, assessing, treatment, and referral practices for depression in diabetes patients (Osborn, Kozak, and Wagner, 2010). The researchers also provided a Continuing Education (CE) training program on the topic as an intervention to see whether these variables and their prediction of intent to screen for depression could be affected. Measurements of the variables were taken pre-CE training, post-training, and at a 6 week follow-up. Results showed that, comparing pre-CE training to post, physicians reported more favorable attitudes, greater confidence, and greater intent to address depression

following treatment. They also reported fewer negative attitudes in addressing depression. This suggests that training or education may be a tool for addressing attitudes and confidence, which should bolster intent to perform an action. In the 6-week follow-up, physicians reported a significant increase in educating patients about depression. Fewer barriers were a consistent predictor of practice change throughout the study, with the authors recommending that barriers, along with intention and confidence, be the target of future interventions. The study is limited by attrition rates – only 37 of the 98 physicians provided data at the follow-up period.

A study by Casper (2007) used the TPB as an intervention framework, comparing normal CE training and a CE training based on the TPB to inform physicians of an assessment tool to assist with employment in patients with Serious Mental Illness (SMI), the Need for Change Scale (NfC). The intention to use the tool was assessed with 94 psychiatrists. Results showed those who had taken the TPB-based CE training had greater intent to use the tool, and follow-up at 3 months showed that 72% of this group had implemented the tool in their practice, compared to 48% of those who had normal CE training. This study implies that using training focused on attitudes, subjective norms, and perceived behavioral control may increase a desired practice with clinicians.

The TPB has also been applied to areas of screening outside of mental health. The theory has been used to test to what extent attitudes, subjective norms, and perceived behavioral control in physicians and medical students predict how likely it is a specific behavior will be done. Studies used the theory to

predict breast cancer screening (Kiyang, Labrecque, Douall-Bell, Turcotte, Farley, Bas, et al., 2015), intimate partner violence screening (Aluko, Beck, and Howard, 2015), Down syndrome screening during pregnancy (Legare, St-Jacques, Gagnon, Njoya, Brisson, Fremont, and Rousseau (2011), and recommending a colonoscopy (Honda & Gorin, 2006). The TPB has also been applied to screening areas using nurses as participants. The theory was used as a framework to assess how attitudes, subjective norms, and perceived behavioral control were associated with nurse practitioners' intentions to screen for health literacy in their patients (Cafiero, 2013) and to screen for periodontal disease in patients (Ward, Cobb, Kelly, Walker, and Williams, 2010).

Outside of screening, the Theory of Planned Behavior has been used in health care settings in a variety of ways. Most related to the content of the current study was a study by Kam and colleagues (2012) that used the TPB to assess intentions to refer oncology patients for psychosocial support. The study assessed past referral patterns, perceived attitude of peers, control over referral, attitude toward referral, and awareness in nurses, medical practitioners, and allied health professionals in Australia. While referral was infrequent in this sample, the model showed that 51% of the variance in intent to refer was account for by past referral and awareness, suggesting education or training would be beneficial.

Other studies featuring physicians have used the TPB to assess intent to do specific care practices such as provide sexual health care to adolescents in the emergency department (Miller, Mollen, O'Malley, Owens, Maliszewski,

Goggin, and Patricia, 2014), provide smoking cessation advice (Jradi, Wewers, Pirie, Binkley, and Ferketich, 2015), conduct falls risk assessments for patients and collaborate with staff in assisted living facilities (Nyrop, Zimmerman, Sloane, and Bangdiwala, 2012), and vaccinate against HPV (Askelson, Campo, Lowe, Dennis, Smith, and Andsager, 2010).

Several studies featuring physicians used the TPB to assess the intent to perform behaviors related to policy or improving practice such as using printed educational materials to assist with referral and prescribing practices (Grimshaw, Zwarenstein, Tetroe, Godin, Graham, Lemyre et al., 2007), participating in shared decision-making for prescribing antibiotics (Legare, Guerrier, Nadeau, Rheaume, Turcotte, and Labrecque, 2013), understanding and reducing overuse of resources in treating patients (Powell, Bloomfield, Burgess, Wilt, and Partin, 2013), translating knowledge of healthy lifestyle choices to obese patients (Ashby, James, Plotnikoff, Collins, Guest, Kable and Snodgrass, 2012), encouraging complementary and alternative medicine (Godin, Beaulieu, Touchette, Lambert, and Dodin, 2007), and following American Heart Association guidelines for myocardial infarction (McGinty & Anderson, 2008). Though these studies may not be as relevant in content, many physicians identified similar barriers such as time, ease, and reimbursement, which hindered ability to perform the target behavior outcome.

There were two studies on the TPB that have included psychologists. The first assessed psychologists' intent to promote physical activity, with previous promotion of physical activity having the largest effect on future intention

(Faulkner & Biddle, 2001). The second study assessed psychology PhD students to determine their intent to work with patients who were HIV positive. Attitude toward HIV and AIDS was the largest predictor of anxiety related to working with this population (Berger & O'Brien, 1998).

Finally, nurses have been the focus of several TPB studies. Some studies used the TPB to assess the intent of behaviors related to policy or practice such as using computers (Shoham & Gonen, 2008), telling the truth about difficult diagnoses (Tabak, Itzhaki, Sharon, and Barnoy, 2013), following clinical guidelines (Kogan & Tabak, 2012), providing women with education on heart disease (Kiamco-Millman & Pinto-Zipp, 2013), using electronic health records (Leblanc, Gagnon, and Sanderson, 2012), and reporting medication errors (Tabak & Fleischman, 2011). Other studies assessed the relevance of TPB to providing an accurate reading of blood pressure (Nelson, Cook, and Ingram, 2014), working with SARS patients (Kim, Yoo, Yoo, Kwon, and Hwang, 2006), hand hygiene (Pessoa-Silva, Posfay-Barbe, Pfister, Touveneau, Pemeger, and Pittet, 2005), administering opioids for pain (Edwards, Nash, Najman, Yates, Fentiman, Dewar et al., 2001), providing smoking cessation advice (McCarty, Hennrikus, Lando, and Vessey, 2001), and caring for HIV/AIDS patients (Delorio, 1997). These studies demonstrated that the TPB constructs could be used to predict whether nurses would achieve several outcomes within the healthcare field.

In summary, the TPB has been used with physicians, psychologists, and nurses to assess how their attitudes, subjective norms, and perceived behavioral

control predict their intent to perform a behavior. There was only a small portion of the research that focused on screening, especially of mental illness. The TPB studies found that the barriers identified by the physicians and nurses are those being targeted for intervention in the current study. The theory can be easily tested as a framework for screening in the current study.

Summary

Screening for depression is a brief method of assessing a patient's symptoms in order to direct further action such as diagnosis, treatment, or referral to another health professional. In the absence of a screening framework, clinicians make independent, case-by-case judgments on whether or not to screen their patients for depression. Decisions to screen are especially important for older adult populations, who have more complicated presentations and a higher likelihood of medical comorbidities (Jeste et al., 1999; Noel et al., 2004). In order to improve screening decisions for depression, two areas of existing research should be considered: researching clinicians who have the capability to screen older adults and the barriers they endorse that prevent them from screening.

The majority of research on screening older adults for depression has studied the process in primary care settings with a physician as the clinician. Older adults regularly visit primary care physicians (Gallo, Rabins, & Iliffe, 1997; Shah, McNiece, & Majeed, 2001; Loftis & Salinsky, 2006), yet research shows that physicians rarely screen older adults for mental illness (Glasser & Glavdal, 1997; Tai-Seale et al., 2005) and do not often recognize mental illness

sufficiently (Pfaff & Almeida, 2005; Tai-Seale et al., 2005). Research on depression screening has examined whether screening is effective by observing whether screening results affect physician behaviors such as making a notation, diagnosis, referral, and treatment (Magruder-Habib, 1990; Callahan et al., 1994; Callahan et al., 1996; Williams et al., 1999). Most studies found that screening or being aware of screening results leads to increased notification and diagnosis of depression by physicians in the short term, but significant differences in the number of participants diagnosed with depression were rarely present at follow up. Screening also had mixed effects on treatment or referral depending on the study.

The purpose of this study is to examine the influence of barriers on clinicians' decision-making for screening for depression or referral to other health professionals, explore characteristics of depression screening or referral of older adults by several clinical disciplines in varied settings, and explore how well the Theory of Planned Behavior (TPB; Azjen 1988, 1991) is supported as a framework for understanding the likelihood of screening for depression. Studies have utilized self-report measures for physicians to report barriers and attitudes that prevent them from screening. Physicians have identified lack of time and difficult patients as barriers to screening. Physicians in another study expressed attitudes that were not supportive of preventative services (Solberg et al., 1999). By including other health disciplines, this study can explore whether such views, attitudes, or barriers are common across multiple health care providers for older adults. Exploring other health disciplines' decision-making is more representative

of the interdisciplinary nature of health care and will expand generalizability of the findings.

Other than physicians, clinicians such as nurses, psychologists, and social workers also hold potential opportunities to screen for depression in older adults. This study proposes to use clinical trainees in graduate schools who are advanced in their program and have clinical experience with clients or patients. Research on assessment curriculum within graduate programs with clinical or practice training is scarce and it is therefore unclear how well this potential training translates to screening practice with clients or patients. The results of this research could assist in determining how we train graduate students to screen, and where and how future screening implementation and barrier reduction would be most effectively altered.

This study holds implications for clinical training, education, and curriculum. Findings could lead to policy changes. The field of public health could benefit from learning more about how decisions to screen are made and whether barriers to screening are similar across disciplines, as well as how a decision to screen could be influenced by manipulation or removal of barriers. The study can also inform as to the role of a clinician's attitudes, norms, or perceived behavioral control. Results could inform tailored interventions that seek to improve screening practice through professionals' knowledge, confidence, or attitudes.

Aims and Hypotheses

Primary

Aim 1: To examine the influence of barriers on clinicians' decision-making for screening for depression in older adults or referring them to other health professionals. The barriers chosen are those supported by prior research: time pressure during visit, patient difficulty, and level of symptoms.

H1: There will be a main effect of time pressure during a visit with patient, with less time pressure increasing likelihood of choosing to screen by the trainee, regardless of discipline.

H2: There will be a main effect of patient difficulty, with more adherent patients increasing likelihood of a clinician choosing to screen.

H3: There will be a main effect of level of symptoms, with more symptomatic patients increasing the likelihood of screening.

H4: There will be a main effect of time pressure during a visit with patient, with more time pressure increasing likelihood of referring to another health professional by the trainee, regardless of discipline.

H5: There will be a main effect of patient difficulty, with more adherent patients decreasing likelihood of a clinician referring to another health professional.

H6: There will be a main effect of level of symptoms, with more symptomatic patients increasing the likelihood of referring to another health professional.

Aim 2: To explore how well the Theory of Planned Behavior is supported as a framework for explaining the likelihood of screening for depression and how the variables within the theory interact with the barriers to affect clinician behavior. Clinicians' attitudes, subjective norms, and perceived behavior control related to depression will be assessed.

H7: The Theory of Planned Behavior constructs attitudes, subject norms, and perceived behavioral control will explain the significant main effects of time pressure, patient difficulty, and level of symptoms.

Exploratory

Aim 3: To explore characteristics of depression screening or referral of older adults by several clinical disciplines in varied settings. This study will specifically analyze decisions from professional trainees in the fields of clinical psychology, social work, nursing, and medicine.

H8: To the extent that disciplinary differences in screening are present, they will be explained by Theory of Planned Behavior variables.

METHODS

Study Design and Sample

This cross-sectional, vignette and questionnaire-based study involved presenting advanced graduate students who conduct clinical work with eight randomized vignette conditions in a two (time pressure: low vs. high) by two (patient difficulty: low vs. high) by two (levels of symptoms: low vs. high) mixed complete factorial design. Clinical discipline (psychology, nursing, medicine, and social work) was a between-subjects factor and there were three covariates: attitudes, norms, and perceived behavioral control. Dependent variables included clinical decisions, including screening for depression using a standardized tool and referring the patient to another health professional. Recruitment occurred online locally through emailing an IRB-recruitment letter to medical students listservs, directors of school programs, and graduate student newsletters and daily emails. Recruitment occurred nationally through posting of the recruitment letter in message boards of national professional organizations (Gerontological Society of America), emailing the recruitment letter to directors of programs at universities across the country (Deans of schools), and asking colleagues to share the recruitment letters with their fellow graduate programs. To be included, all participants were required to be graduate-level professional trainees in the

United States who have had clinical experience, including clinical and counseling psychology graduate students (Ph.D., PsyD, or M.S./M.A.), social work graduate students (MSW or Ph.D.), nursing graduate students (MSN, DNP, Ph.D. or M.S.) or medical students (MD or Ph.D.). The study was be presented to participants as examining decision-making about depression in older adults without mentioning screening specifically.

Measures

The Clinical Decision-Making Survey was created for the purpose of this study. It included items on demographics and education, eight depression vignette conditions that manipulated three barriers to screening, and six items about norms, attitudes, and perceived behavioral control regarding screening for depression.

Background Information. *Socio-demographic and education information*. Socio-demographic information was collected through self-report as part of the Clinical Decision-Making Survey. Participants were asked their age, gender, clinical discipline, degree they were working toward, year in their program, and whether they had any specialty gerontology training.

Manipulated, Independent variables. The independent variables in the current study were barriers to screening for depression. These factors were manipulated in a series of vignettes mimicking a healthcare provider encountering an older patient in a healthcare setting, with the study participant taking the perspective of the provider. The vignettes were designed to

standardize the encounter situation with multiple disciplines rating their likelihood of specific clinical decisions. In the vignettes, the patient presents with some form of depressive symptoms. To be able to differentiate between main and interaction effects, all barrier to screening factors were fully crossed, resulting in eight vignette experimental conditions (three factors with two levels each). Vignettes did not feature names or sexes in order to leave the participants' perceptions of the character free from biases. Neutral pronouns were used. Vignettes were piloted with 10 clinical psychology Ph.D. students to ensure variability in clinical decisions in response to the manipulated independent variables.

Time pressure. Time pressure was manipulated in the vignettes to include a high pressure scenario where a health professional encounters a patient. The professional is running behind schedule, has a colleague who called in sick to work, and has many patients waiting to be seen. In the low pressure scenarios, the health professional encounters a patient, but has more time due to a patient cancellation. Time pressure is the most common barrier to screening identified in the literature by physicians and was thus chosen for this study (Callahan et al., 1992; Glasser & Glavdal, 1997; Loftis & Salinsky, 2006; Scogin & Shah, 2006; Solberg et al., 1999).

Patient difficulty. Patient difficulty was manipulated in the vignettes to include a scenario where the patient exhibits a higher level of impatience, frustration, and anger with a hurried and inconvenienced manner. The lower level of difficult features the patient as more cooperative, calm, and compliant. Several studies

identified patient attitudes as a barrier to screening, with concerns about how the patient may react to answering questions about their mood (Scogin & Shah, 2006; Solberg, Korsen, Oxman, Fischer, & Bartels, 1999).

Symptom level. Symptom level was manipulated in the vignettes to include a patient describing relatively few potential symptoms of depression (two) and a patient describing a higher number of potential symptoms of depression (six). The literature on the level of patient symptoms and their relation to screening behavior by practitioners is scarce, though one study of physicians noted that screening may not be necessary because if the patient was depressed "a problem would surface eventually" (Solberg et al., 1999). With a lack of research in the area, symptom level was chosen for an independent variable in this study.

Non-manipulated, Independent variables. ***Clinical discipline.*** The between subjects variable was clinical discipline (Graduate professional trainees in Psychology, Medicine, Social Work, and Nursing). These disciplines were included in this study because of their potential to work in settings where older adults are routinely encountered and their training involving identifying and assessing mental disorders such as depression.

Covariates The three factors of the Theory of Planned Behavior, attitudes, norms, and perceived control, were measured and proposed to be included in the model to determine their relationship with the barriers to affect a decision to screen for depression or refer. The items below were developed with guidance from Azjen and colleagues (2002a).

Attitudes. Attitudes consist of items measuring perceived value or worth of performing the behavior, and includes the consequences of performing the behavior.

For attitudes, Question 1 is “Screening for depression in the elderly is:” with participants rating along a 5-point continuum from Harmful to Beneficial. Question 2 is “Screening for depression in the elderly is:” with participants rating along a 5-point continuum from Worthless to Valuable.

Norms. Subjective norms consist of items measuring the social aspect of how a person believes the behavior is expected by peers or by people within a profession. Subjective norms were measured by two items in this study: “How would you rate the relevance of screening for depression to your clinical experience or practice?,” with responses ranging on a 5-point scale from completely relevant to Not at all relevant, and: “It is expected that I will screen for depression with a standardized rating scale in my practice” with participants rating along a 5-point continuum from Completely False to Completely True.

Perceived behavioral control. Perceived behavioral control consists of items measuring whether the person believes they have the possibility to complete the behavior (Azjen, 2002b). Perceived behavioral control has been shown through factor models to be composed of self-efficacy (ease of doing behavior) and controllability (the extent to which the behavior is up to the actor). Perceived self-efficacy has accounted for variance in intentions, while controllability more often predicted behavior (Cheung & Chan, 2000). Perceived behavior control was measured in this study by two items. First, “How would you rate your knowledge

of screening for depression?" with responses ranging on a 5-point scale from completely knowledgeable to not at all knowledgeable. The second item for perceived behavioral control is "How would you rate your confidence in screening for depression?" with responses ranging on a 5-point scale from completely confident to not at all confident.

Dependent variable. The primary outcome of this study was the self-reported likelihood or intention of the graduate students to screen the patient for depression or refer the patient to another health professional. Each graduate student participant was presented with eight randomized vignettes that standardized the encounters with the patients. After reading each vignette, they were asked to 'Please rate the likelihood that you would do each of the following in this scenario' was posed. A 5-point rating scale was provided ranging from 5 = Very Likely to 1 = Very Unlikely. While the two main outcomes for analysis were screening for depression and referral to another health professional, these items were hidden among a list of five options: continue to monitor the symptoms at the next appointment, screen the patient for depression, refer the client to another health professional, recommend depression treatment for the patient, and provide education on depression.

Procedures

The Clinical Decision-Making Survey was created on the online platform Qualtrics. Ten clinical psychology students from the University of Louisville piloted the survey. They provided feedback to the author regarding the clarity of instructions and the realistic nature of the vignettes. Pilot data were analyzed and

found to have sufficient variability in the responses to likelihood of screening and referral to another health professional.

Participants were recruited through several online methods. Nursing, psychology, medicine, and social work programs were contacted and informed of the study's aim and protocol. If a school administration approved, a faculty member or administrator shared an IRB-approved recruitment letter including the survey hyperlink to students. Consent was given through the taking of the survey. Some national organizations with members from multiple disciplines agreed to share a hyperlink to the survey via email listservs or message boards. Students were incentivized to complete the survey with the chance to enter a drawing to win an Apple iPad. Participants who chose to provide identifying information for the drawing were taken to a separate online survey form, where their information could not be connected to their responses on the Clinical Decision-Making Survey. The length of time to complete the survey was typically 15 to 20 minutes.

The online survey randomly presented each participant with all eight vignette conditions in a randomized order to control for carry-over effects (See Appendix A for vignettes). After reading each vignette, the participant rated their likelihood of conducting each of five outcomes (See Appendix B), two of which were screening and referral to another health professional. Finally, after all vignettes were presented and outcomes rated, participants answered six questions to assess attitudes, subjective norms, and perceived behavioral control in relation to screening for depression (see Appendix C). Participants were forced to respond to all items in order to proceed to the next item in the survey and were

not able to go back and change their answers to their screening likelihood ratings. The items measuring attitudes, norms, and perceived behavioral control were purposefully placed after the vignettes so that participants rated their likelihood of screening without bias that the study may have more of a focus on screening rather than on several clinical decisions.

The Institutional Review Board of the University of Louisville reviewed and approved this study.

Data Analyses

Data were analyzed using IBM's SPSS 24.0. All hypotheses were tested using two mixed ANOVA models testing likelihood of screening and likelihood of referral. A Mixed-effects model then tested whether TPB covariates affected significant effects in the first model. Descriptive statistics were calculated for all study variables to examine normality and outliers, while analysis outcomes were checked to ensure all assumptions of a Mixed ANOVA were met. Incomplete surveys or surveys with missing data were not included in the analyses. Chi Square tests were run to examine relationships between disciplines and demographic data. A two-tailed alpha was set at .05 for all tests.

Hypotheses 1-3

A Mixed ANOVA was used to analyze the three hypotheses that there would be main effects of time pressure (hypothesis 1), patient difficulty (hypothesis 2), and symptom level (hypothesis 3) on the likelihood of screening for depression. The Mixed ANOVA included clinical discipline as the between-

subjects factor and the likelihood of screening for the eight vignettes as a within-subjects, repeated variable since each participant rated all eight vignettes. The likelihood of screening responses were negatively skewed, however, no transformation was applied because of the lack of a true zero in the data. Post-hoc analyses were conducted using Scheffe's criteria.

Hypotheses 4-6

A Mixed ANOVA was used to analyze the three hypotheses that there would be main effects of time pressure (hypothesis 4), patient difficulty (hypothesis 5), and symptom level (hypothesis 6) on the likelihood of referring the patient to another health professional. The Mixed ANOVA included clinical discipline as the between-subjects factor and the likelihood of referral for the eight vignettes as a within-subjects, repeated variable since each participant rated all eight vignettes. The likelihood of referral responses were negatively skewed, however, no transformation was applied because of the lack of a true zero in the data (Neville & Lane, 2007). Pairwise comparisons were conducted on significant effects using Bonferroni corrections.

Hypotheses 7 & 8

For significant main effects of time pressure, patient difficulty or symptom level on likelihood of screening or significant differences in likelihood of screening between disciplines, a Mixed-effects model was created using SPSS MIXED. Mixed-effects modeling allows testing of covariates on within-subjects effects when there is heterogeneity of variance or covariance between repeated-

measured effects. The covariates would be entered into the model to determine whether controlling for the variance they explained would change the outcome of the analysis, moderating the main effects or discipline differences. Participant responses to the two items for each covariate (attitudes, norms, and perceived behavioral control of screening) were summed, then mean centered to better interpret the model. Further explorations of the TPB variables included three one-way ANOVA analyses examining differences between disciplines in the TPB variables (attitudes, norms, and perceived behavioral control) and several multiple regression analyses with the TPB variables explaining variance in screening across all disciplines and then separated by discipline.

RESULTS

Recruitment

Prospective participants received an IRB-approved recruitment letter explaining the purpose of the study, the benefits and risks of participating, and providing a link to the online survey. The letter informed participants of the opportunity to enter into a random drawing for an Apple iPad. Participants were recruited online both in the local Louisville area and nationally through listservs, member message boards, and emailing university faculty members directly. Heavy recruitment occurred through the University of Louisville (psychology, social work, and medicine), Gerontological Society of America student groups, Pennsylvania State University nursing, Northeastern University nursing, and *U of L Today* daily emails. Several training directors within VA hospitals who worked with graduate students in medicine, social work, and nursing were approached and agreed to distribute the recruitment letter to graduate trainees. Recruitment continued until each clinical discipline group had at least 45 participants with completed surveys.

Sample characteristics

There were 364 surveys attempted, with 229 of those surveys completed. Two people marked “no” at the consent page and their surveys ended. The 229 completed surveys were broken down by clinical discipline as 83 medical

students, 51 psychology students, 49 nursing students, and 45 social work students. The complete sample had a median age of 28, and was 72.1% female. Graduate student participants were working towards PhDs (34.1%), MDs (33.2%), MSW (14.4%), MSN (14.0%), PsyD (1.7%), MS/MA (1.7%), and DNP (0.9%). Many participants were in their 1st (27.1%), 2nd (25.8%), or 3rd (23.1%) years of study, while fewer participants were in their 4th (10.9%) or 5th (13.1%) years of study. 83% of participants said they had had some clinical experience with a patient or client during their graduate training, and 25.8% of participants said they had received specialty training in gerontology. Initially, it was a requirement for participation that the participants had had some clinical experience during their graduate training. However, an error was made in the survey rules that did not automatically end the survey when a “no” response was given to the item. It is noted that 39 participants or 17% reported no previous clinical experience with a patient or client. See Table 1 for a breakdown of sample characteristics by clinical discipline.

Table 1. Sample characteristics by clinical discipline				
	Psychology	**Medicine**	**Nursing**	**Social Work**
n	51	83	49	46
Mean Age	29.2 years	25.7 years	35.2 years	31.04 years
% Female	78.40%	45.80%	95.90%	87%
Degree	86.2% PhD, 7.8% PsyD, 3.9% MS/MA	91.6% MD, 7.2% PhD	28.6% PhD, 65.3% MSN, 2% MS/MA, 4.1% DNP	69.6% MSW, 30.4% PhD
Year in Program	11.8% 1st, 7.8% 2nd, 19.6% 3rd, 11.7% 4th, 49% 5th	31.3% 1st, 24.1% 2nd, 26.5% 3rd, 16.9% 4th, 1.2% 5th	30.6% 1st, 38.8% 2nd, 18.4% 3rd, 10.2% 4th, 2% 5th	32.6% 1st, 34.8% 2nd, 26.1% 3rd, 6.5% 5th
Clinical Experience	96%	78.30%	75.50%	84.80%
Previous Gero Experience	29.40%	15.70%	34.70%	30.40%

There was a significant association between discipline and gender of participants χ^2 (6) = 48.839, $p < .001$. There were more men in the medicine discipline than expected, and fewer men than expected in psychology, nursing, and social work. There was a significant association between discipline and year in one's program χ^2 (12) = 91.228, $p < .001$. This result was driven by psychology students having more 5th year students than expected, with the other disciplines having fewer 5th year students. This finding makes sense because some clinical graduate degrees such as Masters in these disciplines do not require more than two or three years of study. Psychology students also had fewer participants in earlier years of study. There were no social work participants in their 4th year of study.

There was no significant association between discipline and whether a participant had specialty experience in gerontology χ^2 (3) = 7.350, p = .062, though the result approached significance due to the number of medical students who reported having no specialty training in gerontology. Finally, a Brown-Forsythe test revealed a significant difference in age among disciplines, F(3, 119.408) = 17.48, p < .001. Follow-up Games-Howell means comparisons revealed that medical students were significantly younger than participants in the other three disciplines, and psychology students were significantly younger than nursing students.

Assumptions

There are several assumptions of a mixed ANOVA, some of which are satisfied with study design and data collection; others are tested during the analysis. The sample data satisfied most of the assumptions required by a mixed ANOVA analysis; however, there were some violations. The dependent variables and covariates were Likert data. Although Likert data is ordinal in nature, research has shown that parametric tests feature robustness that allows one to treat Likert data as continuous (Norman, 2010). The dependent variables measuring likelihood of screening and likelihood of referring were negatively skewed, with most participants rating they were likely or very likely to screen. This was most likely due to the nature of the vignettes showcasing a person with depressive symptoms, but also due to the unrealistic extreme nature of the other end of the spectrum, being “very unlikely” to screen. In the absence of a true zero, data were not log or reverse transformed. The skewed Likert data also

represents what most health professionals would choose. In other words, such non-normality is expected in the population.

The sample size of the medical students was 83, with the others having 46, 49, and 51 participants each. Such a difference in sample size could have affected Box's test of equality of covariances. This test is sensitive to differences in sample size between groups. Despite the violations in these assumptions, the mixed ANOVA is a robust test that is unlikely to have the main analysis outcomes affected in any meaningful way. The data met the assumption of independence of observations.

Likelihood of screening for depression

A 4-way mixed ANOVA (1 between-subjects factor, 3 within-subjects factors) tested the hypotheses of main effects for time pressure, patient difficulty, and level of symptoms on the likelihood of screening for depression. Table 2 shows the means for likelihood of screening across each of the experimental conditions (vignettes).

Mean scores for likelihood of screening with a standardized rating tool

Condition	Discipline	Mean	Std. Deviation	N
Vignette1: low time pressure, low patient difficulty, fewer symptoms	Medicine	4.00	1.071	83
	Psychology	4.29	0.944	51
	Nursing	4.27	0.930	49
	Social Work	3.87	1.147	46
	Total	4.10	1.038	229
Vignette 2: low time pressure, low patient difficulty, more symptoms	Medicine	4.24	1.054	83
	Psychology	4.51	0.703	51

	Nursing	4.47	0.767	49
	Social Work	4.50	0.753	46
	Total	4.40	0.871	229
Vignette3: low time pressure, high patient difficulty, fewer symptoms	Medicine	4.13	0.934	83
	Psychology	4.20	0.939	51
	Nursing	4.39	0.885	49
	Social Work	4.11	1.016	46
	Total	4.20	0.942	229
Vignette 4: low time pressure, high patient difficulty, more symptoms	Medicine	4.28	0.954	83
	Psychology	4.37	0.871	51
	Nursing	4.43	0.791	49
	Social Work	4.24	0.970	46
	Total	4.32	0.903	229
Vignette5: high time pressure, low patient difficulty, fewer symptoms	Medicine	3.69	1.147	83
	Psychology	4.14	0.939	51
	Nursing	4.00	1.099	49
	Social Work	3.76	1.099	46
	Total	3.87	1.092	229
Vignette6: high time pressure, low patient difficulty, more symptoms	Medicine	4.06	1.004	83
	Psychology	4.24	0.907	51
	Nursing	4.27	0.836	49
	Social Work	4.30	0.891	46
	Total	4.19	0.926	229
Vignette7: high time pressure, high patient difficulty, fewer symptoms	Medicine	3.73	1.127	83
	Psychology	4.02	0.905	51
	Nursing	3.98	0.968	49
	Social Work	3.85	1.154	46
	Total	3.87	1.054	229
Vignette8: high time pressure, high patient difficulty, more symptoms	Medicine	4.14	1.061	83
	Psychology	4.16	1.027	51
	Nursing	4.24	0.855	49
	Social Work	3.98	1.105	46
	Total	4.14	1.019	229

Table 2. Mean likelihood of screening scores by vignette and discipline

Box's Test of Equality of Covariance Matrices was significant, indicating a violation of the assumption of equal covariances. This test is sensitive, especially when there are differences between group sample sizes, and because of the differences in sample size, the violation was expected. Mauchley's Test of Sphericity was ignored for this analysis, as the within-subjects factors time pressure, patient difficulty, and level of symptoms each had two levels. A test of Sphericity requires at least three levels of a factor, and thus the test yielded no output for this analysis. Levene's test of homogeneity of variances for each experimental condition was non-significant at an alpha level of .05, indicating that the assumption of equal variances was met.

Main effects. There was no significant main effect of the between-subjects variable clinical discipline, $F(3,225) = 1.327$, $p = .266$, $r = .08$. Although psychology students' ($M = 4.240$) and nursing students ($M = 4.255$) ratings were slightly higher than medical students ($M = 4.035$) and social work students ($M = 4.076$), this difference did not reach significance. Pairwise comparisons using Bonferroni corrections confirmed there were no significant differences between individual discipline groups. Because there was no difference between disciplines in likelihood of screening, hypothesis 8 becomes obsolete, as there is no significant clinical discipline effect for the covariates to explain.

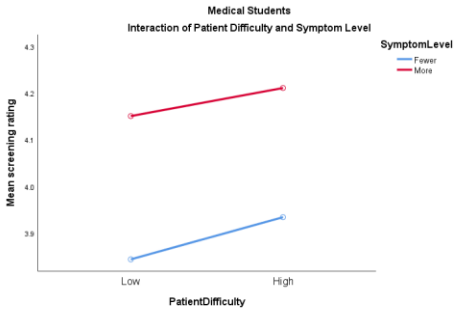
There was a significant main effect of time pressure, $F(1,225) = 40.705$, $p < .001$, $r = 0.39$. Pairwise comparisons indicated that participants were more likely to screen when time pressure was low ($M = 4.268$) compared to when it was high ($M = 4.035$), $t = 6.297$, $p < .001$.

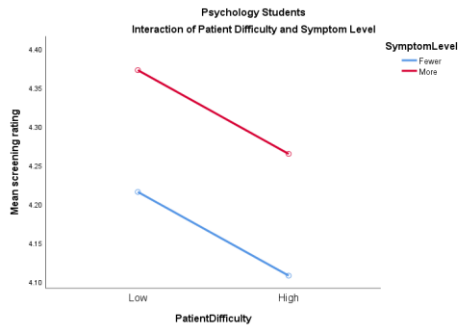
There was no significant main effect of patient difficulty, $F(1,225) = .272$, $p = .603$, $r = .03$. This result indicates that when you ignore all other variables, participants rated their likelihood of screening about the same whether the patient was more ($M = 4.141$) or less difficult ($M = 4.162$).

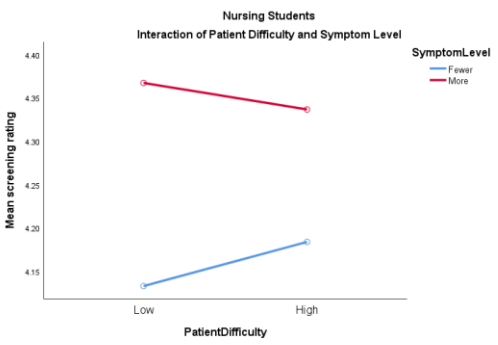
There was a significant main effect of symptom level, $F(1,225) = 51.006$, $p < .001$, $r = .43$. This result indicates that when you look at the level of symptoms while ignoring all other variables, there was a difference in ratings of likelihood of screening between patients presenting with a fewer symptoms versus more symptoms. Pairwise comparisons indicate participants were more likely to screen when patients presented with more symptoms ($M = 4.277$) than when there were fewer symptoms ($M = 4.026$), $t = 7.14$, $p < .001$.

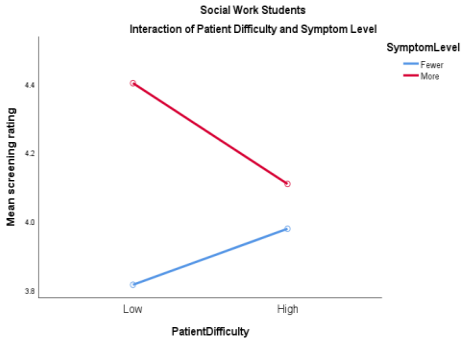
Interaction effects. The 4-way interaction between discipline, time pressure, patient difficulty, and symptom level was not significant, $F(3,225) = .035$, $p = .991$. There was a significant 3-way interaction between discipline, patient difficulty, and symptom level, $F(3,225) = 3.149$, $p = .026$. This means that when faced with patients showing more or fewer symptoms of depression, the clinical disciplines varied in their likelihood of screening based on whether the patient was being difficult or not. For post hoc analysis of this interaction a new F critical value was calculated using the Scheffe criteria. First, the critical value of F at (3,225) degrees of freedom was found to be 2.68. This was then multiplied by the degrees of freedom for each factor, or (2.86)(3)(1)(1)(1) = 8.04, the new adjusted F value that post hoc tests must be greater than in order to be statistically significant.

To further investigate the significant interaction, the file was split by discipline and a factorial repeated measures analysis was run. The output showed the patient difficulty x symptom level interaction for each discipline, with the 3-way interaction being driven by a significant patient difficulty x symptom level interaction for social work students, $F(1,45) = 11.531$, $p = .001$. Marginal means showed that if a patient was not being difficult, there was a large gap in likelihood of screening based on the level of symptoms being endorsed by the patient ($M = 3.815$ for fewer symptoms and $M = 4.402$ for more symptoms). However, when the patient was being more difficult, the level of symptoms was not as important to the social work students ($M = 3.978$ for fewer symptoms and 4.109 for more symptoms (see Figure 5). Thus, for social work graduate students, the level of symptoms had more of an effect on likelihood of screening only when the patient was not being very difficult.









Figures 2-5. Plots of the marginal means for the likelihood of screening at the patient difficulty x symptom level interaction for each discipline. Clockwise from top left: figure 2 medicine, figure 3 psychology, figure 4 nursing, figure 5 social work.

The 3-way interaction was also influenced by the fact that other disciplines had different patterns in their likelihood of screening ratings for these two variables. Medical students showed consistency with a greater likelihood of screening those with more symptoms despite a patient's difficulty, as well as a slight increase in likelihood of screening for a more difficult patient, regardless of symptom level (see Figure 2).

Psychology students also showed consistency with a greater likelihood of screening those with more symptoms despite a patient's difficulty, but showed a steeper *decrease* in likelihood of screening when a patient was more difficult, regardless of symptom level (see Figure 3).

Finally, nursing students had similar likelihood of screening ratings to those in social work; however, when patients were more difficulty, nursing students' likelihood ratings did not converge to the same extent as those in social work (see Figure 4).

There was also a 2-way significant interaction between patient difficulty and symptom level, $F(1,225) = 6.182$, $p = .014$, $r = .16$. This means that when you ignore discipline, overall the participants varied in their likelihood of screening when more/fewer symptoms were present based on whether the patient was difficult or not. This significant interaction is largely driven by the differences in the ratings discussed above. See Figure 6 for a plot of the marginal means for patient difficulty by symptom level across all participants. The plot shows that when as patients became more difficult, participants overall indicated that they would be less likely to screen those with more symptoms ($M = 4.323$ to $M = 4.230$), but more likely to screen those with fewer symptoms ($M = 4.002$ to 4.051).

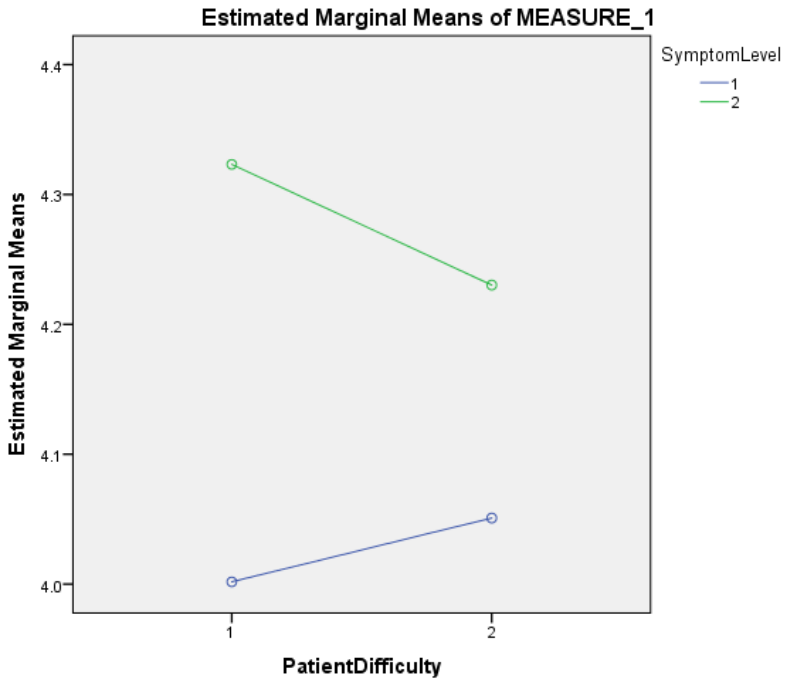


Figure 6. A plot of the marginal means for likelihood of screening for depression at the patient difficulty x symptom level interaction for all participants.

Covariates on likelihood of screening

Hypothesis 7 stated that the Theory of Planned Behavior (TPB) covariates attitudes, norms, and perceived behavioral control would explain any main effects or interactions in the preceding analysis. The Mixed-effects model was run with discipline, time pressure, patient difficulty, and symptom level as fixed effects and the TPB variables (attitudes, norms, and perceived behavioral control) as random effects. Results showed that once covariates were entered into the model, the main effects of time pressure and symptom level remained significant and the interaction between patient difficulty x symptom level also remained significant (see Table 3).

Type III Tests of Fixed Effects[a]

Source	Numerator df	Denominator df	F	Sig.
Intercept	1	203.368	8882.780	0.000
TimePressure	1	1575	52.340	0.000
PatientDifficulty	1	1575	0.460	0.498
SymptomLevel	1	1575	60.225	0.000
Discipline	3	198.504	1.137	0.335
TimePressure * PatientDifficulty	1	1575	0.426	0.514
TimePressure * SymptomLevel	1	1575	0.725	0.395
TimePressure * Discipline	3	1575	0.238	0.870
PatientDifficulty * SymptomLevel	1	1575	4.847	0.028
PatientDifficulty * Discipline	3	1575	1.848	0.137
SymptomLevel * Discipline	3	1575	1.895	0.128

TimePressure * PatientDifficulty * SymptomLevel	1	1575.000	0.798	0.372
TimePressure * PatientDifficulty * Discipline	3	1575	0.169	0.917
TimePressure * SymptomLevel * Discipline	3	1575	1.234	0.296
PatientDifficulty * SymptomLevel * Discipline	3	1575	2.469	0.060
TimePressure * PatientDifficulty * SymptomLevel * Discipline	3	1575	0.022	0.995

a. Dependent Variable: Screening Rating.

Table 3. Results of fixed effects with Mixed-effects model

Despite significant fixed effects remaining with the covariates in the model, parameter estimates showed that the covariates had an effect on the strength of these relationships. Time pressure no longer significantly predicted likelihood of screening (b = .26, p = .063), patient difficulty significantly predicted likelihood of screening where it had not before (b = .33, p = .02), and symptom level no longer predicted likelihood of screening (b = -.13, p = .352). The interaction between patient difficulty and symptom level significantly predicted likelihood of screening (b = -.41, p = .037), as well as the interaction between patient difficulty and being a medical student (b = -.42, p = .019). None of the individual disciplines was a predictor, nor were any of the other interactions.

Exploratory Analyses on Attitudes, Norms, and Perceived Behavioral Control by Discipline

To explore differences in clinical discipline ratings of attitudes, norms, and perceived behavioral control related to screening for depression, a separate one-way ANOVA was run with the TPB variable as the dependent variable and the clinical discipline as the independent variable. Each TPB variable was input as a sum of the two items for a possible range of 2-10 for each participant.

Table 4 shows the means of attitudes, norms, and perceived behavioral control separated by clinical discipline. There was a violation of homogeneity of variance for each of the one-way ANOVAs. To interpret the results in the context of unequal variances, the Brown-Forsythe test was run to test for means differences and the Games-Howell test was used as a post-hoc analysis when overall means were significantly different. The Brown-Forsythe test is an F-test that uses the absolute deviations from the median.

Mean scores of Attitudes, Norms, and Perceived Behavior Control by Discipline

		N	Mean	Std. Deviation
Attitudes	Medicine	83	9.22	1.31
	Psychology	51	9.88	0.43
	Nursing	49	9.78	0.51
	Social Work	46	9.54	0.98
	Total	229	9.55	0.99
Norms	Medicine	83	7.07	1.96
	Psychology	51	8.37	2.12
	Nursing	49	7.37	2.43
	Social Work	46	7.93	1.61
	Total	229	7.60	2.09

Perceived Behavioral Control	Medicine	83	5.30	2.15
	Psychology	51	8.22	1.49
	Nursing	49	5.96	2.28
	Social Work	46	6.59	1.80
	Total	229	6.35	2.26

Table 4. Mean rating of TPB variables by discipline (range 0-10)

There was a significant effect of clinical disciple on attitudes of screening, $F(3, 168.563) = 7.846$, $p < .001$, $\omega = .30$. The Games-Howell post hoc test revealed psychology students had significantly more positive attitudes about screening older adults for depression than medical students, $t(168.563) = 4.28$, $p < .001$, $r = .31$. Nursing students also had more positive attitudes about screening older adults than medical students, $t(168.563) = 3.47$, $p = .004$, $r = .26$, see Figure 7.

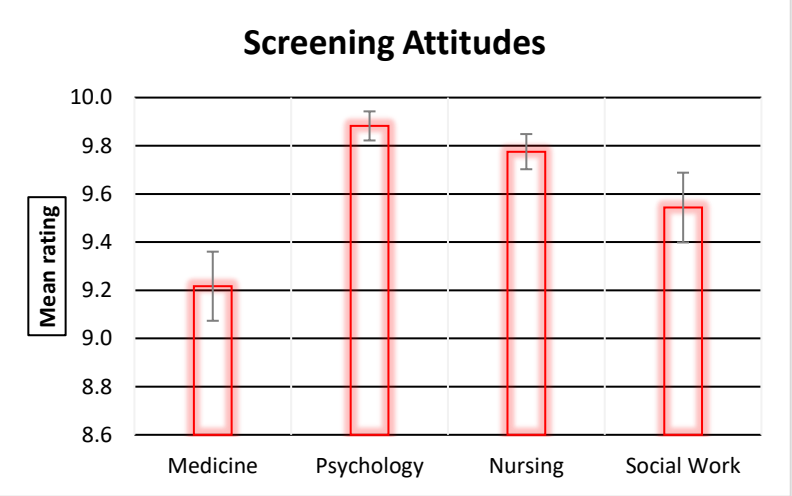


Figure 7. Mean ratings of screening attitudes for each discipline. Error bars represent standard error.

There was a significant effect of clinical discipline on norms of screening, $F(3,185.793) = 4.857$, $p < .001$, $\omega = .22$. The Games-Howell post hoc test

revealed psychology students were more likely to rate that screening was a norm or expected of their role than medical students, $t(185.793) = 3.55$, $p < .001$, $r = .25$. Social work students were also significantly more likely to rate that screening for depression was a norm or expected of their role than medical students, $t(185.793) = 3.47$, $p = .004$, $r = .25$, see Figure 8.

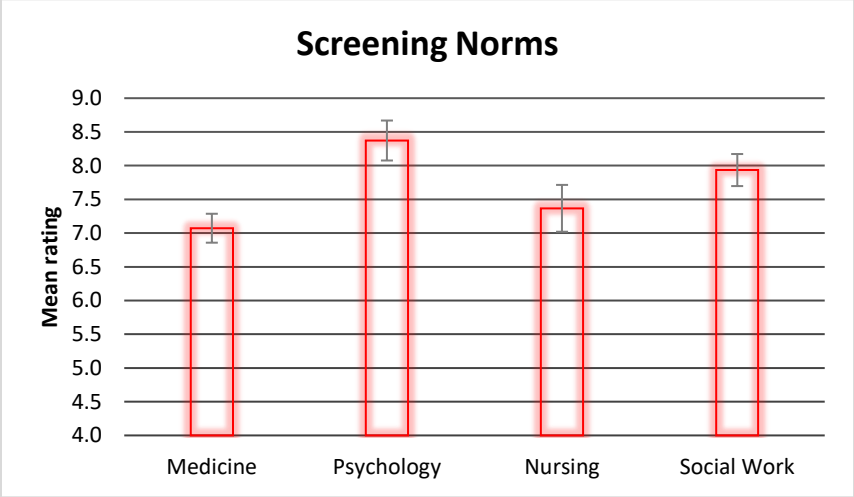


Figure 8. Mean ratings of screening norms for each discipline. Error bars represent standard error.

There was a significant effect of clinical discipline on perceived behavioral control of screening, $F(3,194.297) = 24.592$, $p < .001$, $\omega = .47$. Psychology students had significantly higher ratings of perceived behavioral control of screening for depression than medical students [$t(194.287) = 9.26$, $p < .001$, $r = .55$], nursing students [$t(194.287) = 8.83$, $p < .001$, $r = .38$], and social work students [$t(194.287) = 4.83$, $p < .001$, $r = .33$]. Social work students had significantly higher ratings of perceived behavioral control of screening for depression than medical students, $t(194.287) = 3.62$, $p = .002$, $r = .25$, see Figure 9.

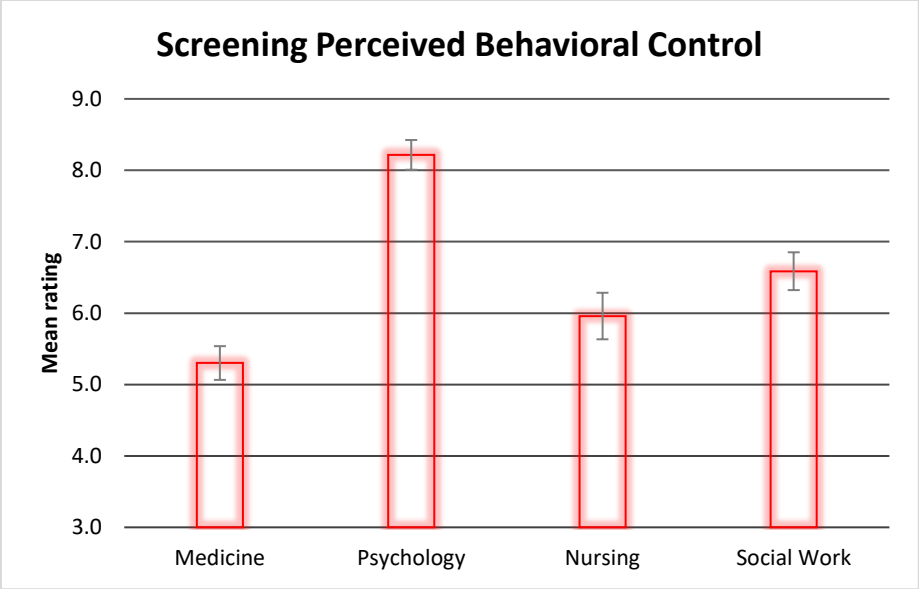


Figure 9. Mean ratings of screening perceived behavioral control for each discipline. Error bars represent standard error.

The relationship between the TPB variables and the likelihood of screening across all disciplines was assessed using a multiple regression. The mean-centered attitudes, norms, and perceived behavioral control variables were entered as independent variables, with the sum of each participant's eight likelihood of screening ratings as the dependent variable. The overall model was significant, explaining 31% of the variance in likelihood of screening, $R^2 = .314$, $F(3,225) = 34.276$, $p < .001$. Attitude significantly contributed to the likelihood of screening after controlling for norms and perceived behavioral control, $b = 1.587$, $t = 4.347$, $p < .001$. As rating in attitude increases by 1 unit, likelihood of screening increases by 1.587 units. Norms significantly contributed to the likelihood of screening after controlling for attitudes and perceived behavioral control, $b = 1.197$, $t = 6.054$, $p < .001$. As rating in norms increases by 1 unit, likelihood of screening increases by 1.197 units. Perceived behavioral control

was not a significant contributor to screening after controlling for attitudes and norms.

The file was then split to compare disciplines and a multiple regression was run with the same independent and dependent variable. For medical students, the overall model was significant and explained 29% of the variance in likelihood of screening, $R^2 = .292$, $F(3,79) = 10.850$, $p < .001$. Attitude significantly contributed to the likelihood of screening after controlling for norms and perceived behavioral control, $b = 1.411$, $t = 2.643$, $p = .01$. As attitude increases by 1 unit, likelihood of screening increases by 1.411 units. Norms significantly contributed to the likelihood of screening after controlling for attitude and perceived behavioral control, $b = .949$, $t = 2.425$, $p = .018$. Perceived behavioral control did not contribute to screening after controlling for attitude and norms in the medical student sample.

For psychology students, the overall model was significant and explained 51% of the variance in likelihood of screening, $R^2 = .514$, $F(3,47) = 16.539$, $p < .001$. Attitude did not significantly contribute to the likelihood of screening after controlling for norms and perceived behavioral control. Norms significantly contributed to screening after controlling for attitude and perceived behavioral control, $b = 1.717$, $t = 5.747$, $p < .001$. Perceived behavioral control was not a significant contributor to screening after controlling for attitude and norms in the psychology student sample.

For nursing students, the overall model was significant and explained 47% of the variance in likelihood of screening, $R^2 = .473$, $F(3,45) = 13.486$, $p < .001$.

Attitude significantly contributed to the likelihood of screening after controlling for norms and perceived behavioral control, $b = 5.225$, $t = 4.445$, $p < .001$. As attitude increases by 1 unit, likelihood of screening increases by 5.225 units. Neither norms nor perceived behavioral control contributed to screening after controlling for the other variables.

For social work students, the overall model was significant and explained 26% of the variance in likelihood of screening, $R^2 = .257$, $F(3,42) = 4.854$, $p = .005$. Attitude did not significantly contribute to the likelihood of screening after controlling for norms and perceived behavioral control. Norms significantly contributed to the likelihood of screening after controlling for attitude and perceived behavioral control, $b = 1.803$, $t = 2.992$, $p = .005$. Perceived behavioral control was not a significant contributor to the model after controlling for attitude and norms in the social work student sample.

Likelihood of referring to another provider

A 4-way mixed ANOVA (1 between-subjects factor, 3 within-subjects factors) was used to test the hypotheses that there would be a main effect of time pressure, patient difficulty, and level of symptoms on the likelihood of referring to another health professional. Table 5 shows the means for likelihood of referring to another health professional across each of the experimental conditions (vignettes).

Mean scores for likelihood of referring to another health professional

Condition	Discipline	Mean	Std. Deviation	N
Vignette1: low time pressure, low patient difficulty, fewer symptoms	Medicine	2.66	1.107	83
	Psychology	2.98	1.288	51
	Nursing	3.00	1.208	49
	Social Work	2.85	1.247	46
	Total	2.84	1.200	229
Vignette 2: low time pressure, low patient difficulty, more symptoms	Medicine	2.86	1.251	83
	Psychology	3.06	1.271	51
	Nursing	3.41	1.223	49
	Social Work	3.17	1.235	46
	Total	3.08	1.256	229
Vignette3: low time pressure, high patient difficulty, fewer symptoms	Medicine	2.99	1.153	83
	Psychology	2.92	1.197	51
	Nursing	3.61	1.222	49
	Social Work	2.98	1.183	46
	Total	3.10	1.206	229
Vignette 4: low time pressure, high patient difficulty, more symptoms	Medicine	3.02	1.137	83
	Psychology	3.02	1.122	51
	Nursing	3.73	1.076	49
	Social Work	3.17	1.217	46
	Total	3.21	1.165	229
Vignette5: high time pressure, low patient difficulty, fewer symptoms	Medicine	2.84	1.174	83
	Psychology	2.86	1.149	51
	Nursing	3.31	1.140	49
	Social Work	3.04	1.246	46
	Total	2.99	1.183	229
Vignette6: high time pressure, low patient difficulty, more symptoms	Medicine	3.05	1.114	83
	Psychology	3.18	1.212	51
	Nursing	3.49	1.157	49
	Social Work	3.30	1.263	46
	Total	3.22	1.180	229
Vignette7: high time pressure, high patient	Medicine	2.99	1.110	83
	Psychology	2.86	1.200	51

difficulty, fewer symptoms	Nursing	3.43	1.137	49
	Social Work	3.13	1.067	46
	Total	3.08	1.138	229
Vignette8: high time pressure, high patient difficulty, more symptoms	Medicine	3.17	1.069	83
	Psychology	3.04	1.199	51
	Nursing	3.76	1.071	49
	Social Work	3.33	1.212	46
	Total	3.30	1.151	229

Table 5. Means of likelihood of referral by vignette and discipline

After running the analysis in SPSS, it was found that Box's Test of Equality of Covariance Matrices was significant, indicating a violation of the assumption of equal covariances. This test is sensitive, especially when there are differences between group sample sizes, and because of the differences in sample size, the violation was expected. Mauchley's Test of Sphericity was ignored for this analysis, as the within-subjects factors time pressure, patient difficulty, and level of symptoms each had two levels. A test of Sphericity requires at least three levels of a factor, and thus the test yielded no output for this analysis. Levene's test of homogeneity of variances for each experimental condition was non-significant at an alpha level of .05, indicating that the assumption of equal variances was met.

Main effects. There was a significant main effect of clinical discipline on likelihood of referral to another health professional, $F(3,225) = 3.055$, $p = .026$, $r = .12$. Pairwise comparisons using Bonferroni corrections confirmed there was a significant difference between nurses and medical students, $t(225) = 2.62$, $p = .023$, $r = .19$, with nursing students being more likely to refer the patient.

There was a significant main effect of time pressure, $F(1,225) = 5.909$, $p = .016$, $r = 0.16$. This result indicates that when you look at time pressure ignoring all other variables, there was a difference in ratings of likelihood of referral to another health professional. Pairwise comparisons indicate that participants were more likely to refer when time pressure was high ($M = 3.173$) compared to when time pressure was low ($M = 3.090$), $t = 2.44$, $p < .016$, $r = .16$.

There was a significant main effect of patient difficulty on likelihood of referral to another health professional, $F(1,225) = 9.69$, $p = .002$, $r = .20$. Pairwise comparisons showed participants were more likely to refer to another health professional when patients were more difficult ($M = 3.197$) than when they were less difficult (3.066), $t = 3.12$, $p = .002$, $r = .20$.

There was a significant main effect of symptom level, $F(1,225) = 33.543$, $p < .001$, $r = .36$. This result indicates there was a difference across all disciplines in ratings of likelihood of referral to another health professional between patients presenting with a fewer symptoms versus more symptoms. Pairwise comparisons indicate participants were more likely to refer patients to another health professional when patients presented with more symptoms ($M = 3.235$) than when there were fewer symptoms ($M = 3.029$), $t = 5.72$, $p < .001$, $r = .35$.

Interaction effects. The 4-way interaction between discipline, time pressure, patient difficulty, and symptom level on likelihood of referral to another health professional was not significant, $F(3,225) = 1.074$, $p = .361$. The only significant interaction was between discipline and patient difficulty, $F(3,225) = 3.771$, $p = .011$. Clinical disciplines varied in their likelihood of referral based on whether

the patient was being difficult or not. Marginal means showed that all disciplines except psychology were more likely to refer to another health professional when a patient was more difficult rather than less difficult. Psychology students overall had a small decrease in likelihood of referral if a patient was more difficult (*M* = 3.020 to *M* = 2.961). Medicine and social work students showed slight increases in likelihood of referral if a patient was more difficulty, and nurses showed a large increase in likelihood of referral (m = 3.301 to m = 3.633). See Figure 10 for plots of how each discipline rates likelihood of referral at each level of patient difficulty.

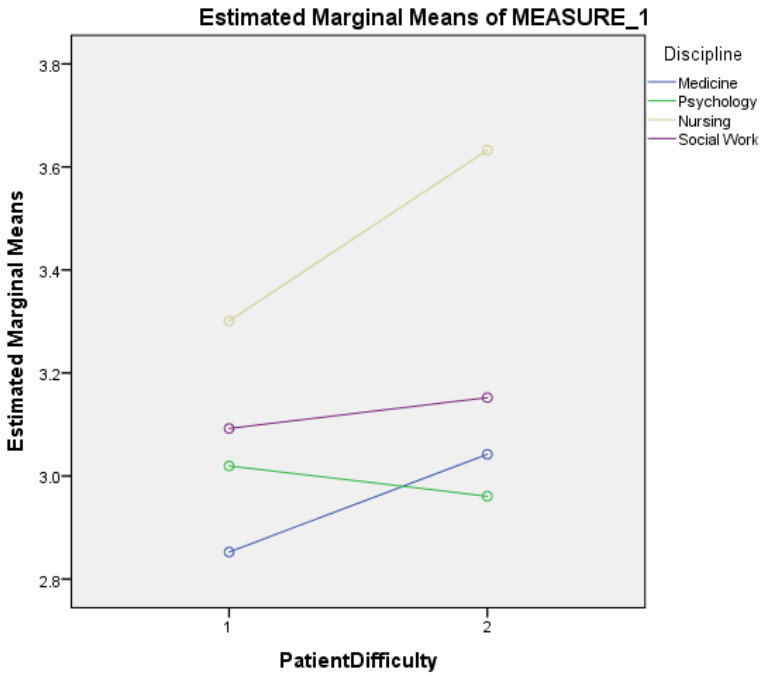


Figure 10. A plot of the marginal means for likelihood of referral at the patient difficulty x discipline interaction.

DISCUSSION

Previous literature showed that older adults are likely to visit their primary care physician for all mental and physical health needs, but that a physician may not perform adequately in identifying or screening for mental illness such as depression. The purpose of this study was to address clinicians' lack of screening older adults for depression by exploring barriers to screening identified in the literature. Furthermore, this study attempted to manipulate these barriers in clinical vignettes presented to graduate students who have clinical roles in an attempt to learn more about how clinician behavior is affected. Finally, the study sought to explore the role of a clinician's attitudes about screening, whether they felt screening was a norm for their role, and how in control they felt about being able to screen, and how these factors affected their likelihood of screening when presented with barriers. The study aimed to examine the influence of time pressure, patient difficulty, and level of symptoms endorsed on clinicians' decision-making for depression screening in older adults, or referring them to other health professionals. The study also sought to explore how well the Theory of Planned Behavior was supported as a framework for understanding the likelihood of screening for depression and how the variables within the theory interact with the clinical barriers to affect clinician behavior. Finally, the study sought to explore characteristics of depression screening or referral of older

adults by several clinical disciplines who work in primary care settings. The following sections will summarize and interpret the findings.

Theory of Planned Behavior as a framework for decision-making

This study explored the TPB as a framework for graduate student clinicians making a decision to screen for depression. All hypotheses around these variables and their relation to screening were exploratory in nature. Findings showed that the disciplines significantly differed in their attitudes about screening, whether screening was a norm for their profession, and whether they felt enough control to be able to successfully screen a patient. Both psychology and nursing students had significantly more positive attitudes about screening than medical or social work students. This is consistent with the literature referenced earlier that some physicians may not find screening entirely useful, especially with regard to older adults. For the attitude scale, respondents rated the benefit and usefulness of screening. Medical students may hold different attitudes of depression screening based on their education and training and their attitude may be influenced by having fewer options available to them for depression treatment, patient education, or ability to monitor symptoms. Psychology students' positive attitudes could be due to being well-trained in screening for depression and being prepared for implementing efficacious treatments.

Psychology and nursing students were significantly more likely to rate screening for depression as a norm for their discipline. Norms were assessed by asking about screening's relevance to their job and screening as an expectation

of their role. This result could also be related to psychology students' mental health training. A surprising result was nursing students' significantly higher ratings than medical students in both norms and attitudes, showing they believe screening to be useful and a duty for their role. Such differences may have been influenced by the lack of psychiatry residents in the medical student sample.

Findings showed that psychology students rated perceived behavioral control significantly higher than all other disciplines. Social work students also rated their perceived behavioral control significantly higher than medical students. Perceived behavioral control is similar to self-efficacy. In this study, it was assessed by asking participants about their knowledge of screening and their confidence in screening for depression. Psychology and social work students may have had more training and direct clinical experience with screening than the other groups. Such differences in attitudes, norms, and control would be expected based on differences in training and education.

Overall, the TPB variables significantly explained significant variance in the likelihood of screening. This finding is congruent with previous research showing that the TPB was a good model for predicting decisions by healthcare professionals by percentage of variance explained (Godin et al., 2008). The disciplines differed in which TPB variables were most important to the likelihood of screening for depression. As was the case in this study, the TPB covariates are often intercorrelated, measuring three aspects of social cognition related to a decision. In the model for nursing students, attitudes contributed the greatest variance to screening; for psychology and social work students, norms

contributed the greatest percent of variance in screening; and for medical students, attitudes and norms contributed approximately equally. An interesting finding is that perceived behavioral control, similar to self-efficacy and found to be the most predictive of intention to act by Cheung and Chan (2000), was not significantly related to screening for depression for any of the disciplines when controlling for the other variables. Such a finding has implications for interventions targeting attitudes and norms of screening. Most graduate clinical training would focus on the *how to* for screening for depression, and not necessarily so much on the importance of screening or whose job it is to screen.

These findings on discipline differences in attitudes, norms, and perceived behavioral control and their relationships to screening can be helpful in guiding future training and education needs. Most graduate training would focus on training student clinicians how to screen for depression. While this training is important and necessary for self-efficacy in screening, the findings in this study suggest that based on one's discipline, more training and education should be directed at how screening is useful and worthwhile, and why it is part of their discipline's role to screen. One's attitudes and norms will highly affect decisions to screen, so education and trainings should target these variables as other studies have successfully done (Casper, 2007; Osborn et al., 2010). Some disciplines find screening to be irrelevant or not expected by their role. It is uncertain whether norms will change when primary care practices are more integrated with mental health practice, but because graduate students in training may work in a number of settings, they should be trained to recognize screening

as relevant and part of the role of any clinician who sees patients, regardless of setting.

Another clear implication from these results is that clinicians who do not feel that screening is useful, relevant, or who simply do not feel they have the knowledge or confidence to screen should be trained in how to refer to another health professional or consult with a colleague in the same discipline. It is unclear how sufficiently graduate clinicians are trained in the areas of referral and consultation, but training in these areas would prevent patients from "falling through the cracks" of the system and give clinicians an acceptable option outside of screening.

Clinical barriers and likelihood of screening

This study also examined clinical barriers from the literature and their effect on likelihood of screening. The hypothesis that time pressure would affect participants' likelihood of screening for depression was supported: respondents were less likely to screen for depression when responding to scenarios where time was short. This finding is consistent with previous findings that physicians often used time pressure as a main reason for avoiding screening (Callahan et al., 1992; Glasser & Glavdal, 1997; Loftis & Salinsky, 2006; Scogin & Shah, 2006; Solberg et al., 1999). This study adds to the literature by confirming an effect of time pressure on a clinical decision and showing that this an effect that occurs across multiple disciplines who have opportunities to screen. This finding

has clinical implications for education on brief, validated depression screeners and training on time management for clinicians who have limited time with patients, as well as other interventions that may help to identify gaps in time efficiency.

The hypothesis that patient difficulty would affect participants' likelihood of depression using a standardized rating scale was not supported. There was evidence from prior research with physicians who claimed that older people do not like to be screened, or that older people were more difficult to deal with, that screening would be less likely under those circumstances (Scogin & Shah, 2006; Solberg, Korsen, Oxman, Fischer, & Bartels, 1999). The non-significant finding is likely the result of how the different disciplines reacted to difficult patients. Though no significant interaction was found between discipline and patient difficulty due to similar means, there were some interesting findings. When encountering more difficult patients, medical and nursing students were slightly more likely to screen for depression, while psychology and social work students were less likely to screen for depression. These findings do not support the previous literature stating that physicians may not screen older adults because they are more difficult. One possible explanation of this finding is that physicians and nurses may encounter patients who present with more general health needs (i.e. a checkup or a hospital), whereas a psychologist or a social worker may be more likely to encounter a patient who presents to them for a specific purpose related to mental health. Thus, a more difficult patient could be less likely to be screened by psychology or social work students because they may be relying

more on clinical judgment. Though the disciplines' decision to screen varied with more or less difficult patients, overall the disciplines were positive toward screening.

The hypothesis that number of symptoms that a patient presents with would affect participants' likelihood of depression screening was supported. There was no previous literature on whether or not symptoms endorsed were a barrier to screening; however, there was literature that mentioned that endorsed symptoms were required for a depression screen to occur. The idea behind this hypothesis was to test whether clinicians would choose to screen when fewer symptoms were endorsed, to check for more symptoms, or whether they were more likely to screen for depression with several symptoms endorsed. One could make the argument that a screening might be unnecessary once a certain number of symptoms are endorsed, as a diagnosis could be made or treatment implemented without the screen. This study adds to the literature by showing that when a patient endorses more symptoms, clinicians are more likely to screen than when a patient endorses fewer symptoms. Respondents seemed to see the presence of depressive symptoms as a reason to conduct further screening, but were less likely to screen when those symptoms were not endorsed. This finding has implications for implementing a policy of screening each patient for depression at the initial meeting, regardless of barriers present. Many of the symptoms of depression can present as physical in nature, such as fatigue, psychomotor retardation, weight loss/gain, or affected sleep. If a patient endorses only one of the symptoms, they are less likely to be screened

according to the finding from this sample. Patients, especially ones known to the physician from previous encounters, could be in danger of having their depression overlooked if they do not present with or endorse several symptoms. In this case, a policy of always screening and educating clinicians to be more aware of all symptoms of depression may be most effective for case identification.

Secondary to these findings was the significant interaction among discipline, patient difficulty, and symptom level related to the likelihood of screening. The disciplines differed in likelihood of screening when patients presented with more or fewer symptoms depending on whether or not the patient was difficult. Medical students were more likely to screen as patients became more difficult, and maintained a consistent gap in likelihood of screening between those with few symptoms endorsed and those with more symptoms. Psychology students were less likely to screen as patients became more difficult, regardless of number of symptoms endorsed. Social work and nursing students responded differently when patients were more difficult. If patients were less difficult, those presenting with fewer symptoms were much more likely to be screened than those with more symptoms. When patients were difficult, the difference in likelihood of screening of patients with fewer versus those with more symptoms was less. With no previous literature on how these factors affect clinical decisions, we can only speculate as to the differences between disciplines. The consistent ratings across symptom level by psychology and medical students indicate that these disciplines are more likely to screen those endorsing more

symptoms. Psychology students may feel less equipped to deal with difficult patients, as patients in the outpatient setting for mental health reasons are typically there by choice. Medical students may feel more equipped to handle difficult patients who may not present in their offices for mental health reasons. Both social work students and nursing students work in multiple settings, so their varying ratings based on the difficulty of the patient may have to do more with their knowledge of depression and whether screening is necessary. The idea that a difficult patient endorsing more symptoms of depression may not need to be screened makes sense if a provider is forming a treatment plan for depression and does not feel screening is needed to confirm the diagnosis. This finding adds to the literature by showing differences in the way disciplines choose to screen are complex. It better informs a flexible approach to training and education on screening by discipline, especially training in varied clinical settings.

TPB and main effects of clinical barriers

The relationship between TPB variables and clinical barriers was also examined. It was hypothesized that if there were differences between clinical disciplines on likelihood of screening, it would be due to differences in attitudes, norms, and perceived behavioral control of screening for depression. There was no effect of discipline on likelihood of screening, so no further analyses were conducted with respect to this hypothesis. The differences between disciplines in TPB variables makes the lack of effect of clinical discipline on likelihood of screening more surprising but shows that overall ratings of screening were generally positive across disciplines. The lack of a difference among disciplines

could mean that the vignettes did not create enough variability in responses, or that participants were generally biased toward appearing good and saying they were likely to screen.

It was also hypothesized that the effects of time pressure, patient difficulty, and symptom level could be explained by the TPB variables attitudes, norms, and perceived behavioral control. These covariates affected the strength of the relationship between time pressure, patient difficulty, and symptoms with likelihood of screening. Time pressure and symptom level no longer predicted likelihood of screening in the mixed-effects model. Clinically speaking, this means that a clinician's likelihood of screening has more to do with their internal experiences and beliefs than a clinical barrier that is present during the appointment.

Likelihood of referral

Finally, this study explored whether clinical barriers affected likelihood of referral, which was chosen as a clinically acceptable alternative in the absence of screening. The hypothesis of an effect of clinical discipline on likelihood of referral to another health professional was supported. There was a significant contrast between nursing students and medical students, with nursing students more likely to refer. There was no previous literature found on nursing referral patterns that might explain this difference. The hypothesis that time pressure would have an effect on referral was supported. Participants rated themselves significantly more likely to refer when time pressure was high. The hypothesis that there would be an effect of patient difficulty on referral was supported, as

there was a significant effect on referral when patients were more difficult. This finding makes sense when providers might suspect an issue with a patient, but are unable to properly assess due to agitation. This decision would also allow for a potential second chance to screen at the referral appointment. Finally, the hypothesis that there would be an effect of symptoms endorsed on referral was also supported. Participants were significantly more likely to refer when patients endorsed more symptoms. Additional symptoms included in the vignettes were pain, anhedonia, feeling down, low appetite, weight loss, poor sleep, and low energy. Participants of all disciplines appeared to think these symptoms were worthy of a follow-up by another health professional.

Although there were no hypotheses regarding interactions among the independent variables, there was a significant discipline by patient difficulty interaction. Psychology students were less likely to refer more difficult patients, while the other disciplines were more likely to refer to another discipline when a patient was being more difficult. The tendency to refer difficult patients was particularly strong among nursing students, while the other disciplines had minimal increases in likelihood based on patient difficulty.

The findings from the likelihood of referral analysis have clinical implications for training and education. It is important to know how disciplines approach their clinical decisions, so more information in future studies would be helpful in determining why one discipline might decide to refer more over others. These findings are also evidence that integrated teams in primary care settings are important because they allow a warm handoff, essentially an immediate

referral. Interdisciplinary teams or multidisciplinary teams are usually established in inpatient settings, however, primary care and mental health integration is popular with VAs as an outpatient manner of ensuring that all aspects of a person's physical and mental health are assessed. Though graduate students say they are likely to refer to another health professional, ensuring these students are sufficiently trained in referral or consultation is an important implication from these results.

Sample

The study required a convenience sample of graduate students who are studying to conduct clinical work. Psychology and social work students were closer to the mean in age, with medical students being significantly younger than other disciplines and nursing students being significantly older. While age was not a variable in the analyses, one's age could correlate to more experience with clinical work or training. Older students could have potentially worked in clinical settings before going back to school. Psychology students in this sample were significantly more advanced in their training years, while medical, nursing, and social work students were more balanced across the first three years of their training. All disciplines had some gerontology experience, but medical students had less than the other disciplines and the difference was not significant. All disciples were over 75% female except for medical students, who were 55% male. Recruiting from medical students occurred mostly from the University of Louisville, while other disciplines had participants from other sources. The medical student sample reported 0% specialization in psychiatry or geriatrics,

which was a surprising finding, though it is unclear how many medical students typically specialize in these areas. It is also possible that the majority of medical student had not chosen a specialization at the time of this survey.

Limitations

There were some limitations to the study. First, this study used a survey measure with clinical vignettes created for this study and not previously validated. Although research has shown that using vignettes can be a valid replacement for measuring actual behaviors (see Evans et al., 2015), it is difficult to know whether these participants acted as they would have in the "real world." Using vignettes also increases the chance for bias in responding. The study attempted to reduce bias in clinical decisions through randomizing vignettes for each participant, masking of the dependent variable of interest among other clinical decisions, randomizing the order in which clinical decision choices were presented after each vignette, and using neutral pronouns and descriptors of the hypothetical patient in the vignette.

Second, this study used Likert and self-report data. Data tend to be negatively skewed when participants rate a high likelihood of x and such data are difficult to transform without a valid reason due to the lack of a true zero. The author made a judgment not to transform the data due to the robustness of a mixed ANOVA analysis and mixed-effects modeling. The negative skew was also expected given the nature of responses in the survey.

Another limitation came from sampling. This study conveniently sampled graduate students who have varying levels of education, clinical training, and life experience. The results can be generalized to graduate students engaged in clinical training, as well as early-career health professionals in psychology, nursing, medicine, and social work. It is unclear whether the results can be generalized to established health professionals in these disciplines. There was also potential for volunteer bias during sampling. Participants who completed this survey may be more interested in research, have more flexible schedules or leisure time, be more interested in depression screening or treatment, or be more influenced by incentives than individuals who chose not to participate in this study.

Medical and nursing students' protected status may have made it more difficult for the author to recruit them during the study. The author's colleagues and training setting provided access to many potential participants in clinical psychology and social work, which made recruiting participants in these disciplines more flexible.

The sample size for medical students was larger than the other disciplines, which may have made some of the assumption tests overly sensitive, especially Box's test. This author made a decision to interpret the mixed ANOVA results with this assumption violated and then used a more robust mixed-effects model that could handle such assumption violations. Though participants rated themselves on average as "likely" or "very likely" to screen or to refer, it is difficult to measure the external validity of such ratings. Participants may have been

attempting to appear good or participants may not have even considered a choice such as “unlikely” for any of the vignettes. The means were high for many of the effects, indicating a possible ceiling effect.

CONCLUSION AND FUTURE DIRECTIONS

The focus of this study was on the relationship between clinical barriers, TPB variables related to screening, and clinical graduate students' decision to screen an older person for depression or refer them to another health professional. The study also examined whether a student's attitudes, norms, and self-efficacy of screening for depression was a good framework for understanding their likelihood of screening. The results indicated that the clinical disciplines differed in their ratings of attitudes, norms, and perceived self-efficacy of screening for depression. The Theory of Planned Behavior serves as a good framework for understanding screening behavior. Interestingly, attitudes and norms were the best correlates of depression screening, masking the relevance of perceived behavioral control for each discipline. Attitudes, norms, and perceived behavioral control of screening also affected the strength of effects seen in clinical barriers. Time pressure and symptoms endorsed significantly predicted likelihood of screening, but the TPB variables weakened these relationships, so interventions may need to focus primarily on clinician beliefs and experiences and secondarily on clinical barriers. Repeated applied clinical experience of screening for depression in practice settings for all disciplines may increase self-efficacy, but educational and training interventions on attitudes and norms are more likely to promote screening decisions.

In the absence of a national recommendation on when to screen for depression, clinicians will be more subject to their judgment and more affected by the barriers in this study. Based on the results of this study showing that likelihood of screening can be explained in part by the TPB variables and affected by manipulation of barriers, clinicians should be educated and trained to screen on first contact with a patient especially when there is little time, a difficulty patient, or only one symptom endorsed. Manipulating barriers may not be possible in a real clinical setting, and therefore a strict screening policy with increased education and training on implementation of a screener and self-awareness of one's beliefs and attitudes is suggested. Awareness of one's personal beliefs about screening and how clinical practice barriers affect one's decision to screen will be helpful in making education and training more effective. Similarly, time pressure, difficulty of the patient, and symptoms endorsed may influence a decision to refer a patient to another health professional. If a clinician is aware of their biases about screening and feels unable to screen in a certain situation, they should be prepared to refer their patients to another health professional through education, training, and especially applied practice.

The study's results and implications suggest a number of potential future directions. Assessing differences in screening likelihood or referral can only inform the reader that there were differences. This study did not assess what factors related to each clinical discipline's education or training may have influenced their ratings of screening or referral. Focus groups might capture more information about the goals of each discipline when screening, and the

circumstances surrounding a screening. As each discipline works in potentially different settings, it is important to learn more about how screening is used (e.g. routine check-in, diagnosis, severity of symptoms, treatment planning) and when it is used (yearly, first visit, when patient reports symptoms). It may also be helpful to intervene with interpersonal skills or behavior management for clinicians to better assist with patients who are more difficult or who may misunderstand why a provider is asking them certain questions, rather than avoiding screening because of difficult behavior.

This study only examined three clinical barriers that were identified from previous literature. Other barriers to screening in clinical practice that may be researched in future studies includes clinicians who believe their clinical judgment is better than the screener, determining the mechanics for screening within a practice, and determining whether screening is limited by the clinical setting. Screening decisions may also be affected by the economic costs of implementing a screening policy.

More information on the education and training received by each discipline with regard to depression screening would help guide intervention studies that may increase more positive attitudes, norms, and self-efficacy of screening for depression. A self-assessment tool for TPB variables could also be useful for education and training. Modification of attitudes and norms may also go a long way in increasing screening behavior. Strong attitudes and norms regarding screening may influence screening decisions when a workplace or administration rule does not exist (e.g. every new patient is screened).

Finally, examining actual screenings in primary care settings where mental health care is integrated could allow further exploration of how these barriers and attitudes, norms, and perceived behavioral control influence clinical decisions in a real world setting. On-the-spot supervision of a graduate student screening or role-played scenarios involving the barriers in this study could provide new insights into how screening decisions play out in clinical settings. Though it may not be possible to increase clinicians' time with each patient, ensuring that they have the self-efficacy to assess for depression using a PhQ-2 or PHQ-9 in a few minutes would likely affect a decision to screen. An intervention by interdisciplinary teams in which depression screening "refreshers" are conducted may influence decisions and allow providers to practice their time management.

To the author's knowledge, this is the first study examining the relationship among clinical barriers and social cognitive factors affecting likelihood of screening for depression in older adults and how these factors differ among graduate trainees in psychology, medicine, nursing and social work. The study demonstrated that the Theory of Planned Behavior can be used as a framework for understanding whether an individual is likely to screen for depression. TPB may be more important for understanding screening than clinical barriers such as time pressure or level of symptoms endorsed. With differences among disciplines in attitudes, norms, and self-efficacy about screening and differences in likely of screening depending on the difficulty of the patient, all disciplines should encourage trainees to screen a new patient for depression.

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APPENIDICES

Appendix A

Condition 1 (Low time pressure, low difficulty, low symptom levels)

Your first appointment of the day is a friendly, easy-going 75-year-old who needs basic services. The patient is calm, attentive, and answers questions willingly. The patient reports having been very active throughout life and very engaged socially. You spend some time chatting about his/her children and grandchildren. When you mention the nice spring weather, the patient describes having trouble gardening due to pain from arthritis and a bad back. Otherwise, the patient appears to be in good health. When you ask about the patient's upcoming plans, he/she reports being unsure because of the pain and describes being uninterested in activities that used to be enjoyable and having trouble sleeping. The office is relatively quiet since your next appointment canceled.

Condition 2 (Low time pressure, low difficulty, high symptom levels)

Your first appointment of the day is a friendly, easy-going 75-year-old who needs basic services. The patient is calm, attentive, and answers questions willingly. The patient reports having been very active throughout life and very engaged socially. You spend some time chatting about his/her children and grandchildren. When you mention the nice spring weather, the patient describes having trouble gardening due to pain from arthritis and a bad back. Otherwise, the patient appears to be in good health. When you ask about the patient's upcoming plans, he/she reports being unsure because of the pain and describes being uninterested in activities that used to be enjoyable and having trouble sleeping. When you ask about other changes, the patient also mentions feeling down, having less of an appetite, weight loss, and low energy. The office is relatively quiet since your next appointment canceled.

Condition 3 (Low time pressure, high difficulty, low symptom levels)

Your first appointment of the day is a reserved 75-year-old who needs basic services. The patient seems in a rush, answers questions with very brief responses, and becomes increasingly angry. Attempts to obtain a clinical history are met with resistance, and the patient makes comments such as "I don't see

why this is important!" Attempts to build rapport by talking about family or social life seem to fall flat. When you mention the nice spring weather, the patient snaps that they don't spend time outdoors anymore due to arthritis and a bad back. Eventually, the patient reveals being uninterested in activities that used to be enjoyable and having trouble sleeping. The patient mumbles something about doctors asking too many questions and wants to know how much longer the appointment will last. The office is relatively quiet since your next appointment canceled.

Condition 4 (Low time pressure, high difficulty, high symptom levels)

Your first appointment of the day is a reserved 75-year-old who needs basic services. The patient seems in a rush, answers questions with very brief responses, and becomes increasingly angry. Attempts to obtain a clinical history are met with resistance, and the patient makes comments such as "I don't see why this is important!" Attempting build rapport by talking about family or social life seem to fall flat. When you mention the nice spring weather, the patient snaps that they don't spend time outdoors anymore due to arthritis and a bad back. Eventually, the patient reveals being uninterested in activities that used to be enjoyable and having trouble sleeping. When you ask about other changes, the patient reluctantly gives more information about feeling down, having less of an appetite, weight loss, and low energy. The patient mumbles something about doctors asking too many questions and wants to know how much longer the appointment will last. The office is relatively quiet since your next appointment canceled.

Condition 5 (High time pressure, low difficulty, low symptom levels)

You have been running behind with your appointments all morning because a colleague called in sick. A patient comes in to see you: a friendly, easy-going 75-year-old here for basic services. The patient is calm, attentive, and answers questions willingly. The patient reports having been very active throughout life and very engaged socially. You spend some time chatting about his/her children and grandchildren. When you mention the nice spring weather, the patient describes having trouble gardening due to pain from arthritis and a bad back. Otherwise, the patient appears to be in good health. When you ask about the patient's upcoming plans, he/she reports being unsure because of the pain. As the appointment is about to end, patient describes being uninterested in activities that used to be enjoyable and having trouble sleeping. You know there are several people in the waiting area who have been waiting over 45 minutes.

Condition 6 (High time pressure, low difficulty, high symptom levels)

You have been running behind with your appointments all morning because a colleague called in sick. A patient comes in to see you: a friendly, easy-going 75-year-old here for basic services. The patient is calm, attentive, and answers questions willingly. The patient reports having been very active throughout life and very engaged socially. You spend some time chatting about his/her children and grandchildren. When you mention the nice spring weather, the patient describes having trouble gardening due to pain from arthritis and a bad back. Otherwise, the patient appears to be in good health. When you ask about the patient's upcoming plans, he/she reports being unsure because of the pain. As the appointment is about to end, patient describes being uninterested in activities that used to be enjoyable and having trouble sleeping. When you ask about other changes, the patient also mentions feeling down, having less of an appetite, weight loss, and low energy. You know there are several people in the waiting area who have been waiting over 45 minutes.

Condition 7 (High time pressure, high difficulty, low symptom levels)

You have been running behind with your appointments all morning because a colleague called in sick. A patient comes in to see you: a reserved 75-year-old who needs basic services. The patient seems in a rush, answers questions with very brief responses, and becomes increasingly angry. Attempts to obtain a clinical history are met with resistance, and the patient makes comments such as "I don't see why this is important!" Attempts to build rapport by talking about family or social life seem to fall flat. When you mention the nice spring weather, the patient snaps that they don't spend time outdoors anymore due to arthritis and a bad back. As the appointment is about to end, the patient reveals being uninterested in activities that used to be enjoyable and having trouble sleeping. The patient mumbles something about doctors asking too many questions and wants to know how much longer the appointment will last. You know there are several people in the waiting area who have been waiting over 45 minutes.

Condition 8 (High time pressure, high difficulty, high symptom levels)

You have been running behind with your appointments all morning because a colleague called in sick. A patient comes in to see you: a reserved 75-year-old who needs basic services. The patient seems in a rush, answers questions with very brief responses, and becomes increasingly angry. Attempts to obtain a clinical history are met with resistance, and the patient makes comments such as "I don't see why this is important!" Attempts to build rapport by talking about family or social life seem to fall flat. When you mention the nice spring weather,

the patient snaps that they don’t spend time outdoors anymore due to arthritis and a bad back. As the appointment is about to end, the patient reveals being uninterested in activities that used to be enjoyable and having trouble sleeping. When you ask about other changes, the patient reluctantly gives more information about feeling down, having less of an appetite, weight loss, and low energy. The patient mumbles something about doctors asking too many questions and wants to know how much longer the appointment will last. You know there are several people in the waiting area who have been waiting over 45 minutes.

Appendix B

Please rate the likelihood that you would do each of the following in this scenario:

A. Continue to monitor the symptoms at the next appointment
B. Screen the patient for depression with a standardized rating scale
C. Refer the client to another health professional
D. Recommend depression treatment for the patient
E. Provide education on depression

1 - very unlikely; 2 - unlikely; 3 – neutral; 4 – likely; 5 - very likely

Appendix C

1. Screening for depression in the elderly is:

   Not Beneficial ___ ___ ___ ___ ___ Beneficial

   1 2 3 4 5

2. Screening for depression in the elderly is:

   Worthless ___ ___ ___ ___ ___ Useful

   1 2 3 4 5

3. How would you rate the relevance of screening for depression with a standardized rating scale to your clinical experience or practice?

   1 – Not at all relevant

   2 – Slightly relevant

   3 – Moderately relevant

   4 – Very relevant

   5 - Completely relevant

4. It is expected that I will screen for depression using a standardized rating scale in my practice.

   Completely False ___ ___ ___ ___ ___ Completely True

5. How would you rate your knowledge on screening for depression with a standardized rating scale?

   1 – Not at all knowledgeable

   2 – Slightly knowledgeable

   3 – Moderately knowledgeable

   4 – Very knowledgeable

   5 - Completely knowledgeable

6. How would you rate your confidence in screening for depression with a standardized rating scale?

    1 – Not at all confident

    2 – Slightly confident

    3 – Moderately confident

    4 – Very confident

    5 - Completely confident

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VA Boston Healthcare System, Boston, MA (APA Accredited)

- ***Geriatric Mental Health Outpatient Clinic:*** Conducted individual and group psychotherapy with older Veterans with chronic illness. Conducted intake evaluations. Supervised a practicum student.
- ***Community Living Center***: Conducted individual and family therapy in sub-acute rehab, long-term care, and palliative care settings. Provided end of life support. Conducted capacity evaluations for ability to live independently and participate in discharge planning. Interdisciplinary environment.
- ***Capacity Clinic***: Conducted weekly evaluations assessing capacity to make medical decisions, live independently, or manage finances.
- ***Neuropsychology*** (start April 1, 2018): Anticipated experiences-Neuropsychological testing and report writing
- ***Adjunctive Training Experience - PTSD Clinic***: Provided weekly individual therapy to Veterans with diagnosis of posttraumatic stress disorder. Observed intakes. Co-facilitated PTSD support groups.

2016 – 2017 **Psychology Practicum Student**
United States Army Recruiting Command (USAREC), Fort Knox, KY

- Clinical assessments of Soldiers selected for recruiting duty, review of electronic medical records, consultation with medical providers, psychological assessment interpretation, report writing, reading, and one-on-one supervision.
- Supervisor: MAJ Jeffrey Bass, Psy.D.

2015 – 2016 **Psychology Practicum Student**
Central State Hospital, Louisville, KY

- Conduct group therapy and education; assess violence risk, suicidality, cognitive impairment, intellectual functioning, malingering, and competency to stand trial for inpatient population with severe mental illness. Review records and

prepare documents for probable cause or final hearings when clients are taken to court to show that they are a danger to themselves or others.
- Supervisor: Mary A. Stiff Miller, Psy.D.

2014 - 2017 **Psychotherapist**
Kindred Transitional Care and Rehabilitation Wedgewood, Clarksville, IN
- Individual therapy and assessment with older adult clients in long-term care setting.
- Supervisor: Suzanne Meeks, Ph.D.

2016 – 2017 **Psychotherapist**
University of Louisville Psychological Services Center
- Integrated approach to psychotherapy with adult clients.
- Supervisor: Richard Lewine, Ph.D.

2015 – 2016 **Psychotherapist**
University of Louisville Psychological Services Center
- Mindfulness-based psychotherapy with adult clients.
- Supervisor: Paul Salmon, Ph.D.

2014 – 2017 **Diagnostic Assessor**
University of Louisville Psychological Services Center
- Conducted diagnostic testing for adults. Clinical interviewing, administration of standardized testing, one-on-one supervision and chart review/integrated clinical report writing.
- Supervisor: David Winsch, Ph.D.

2014- 2017 **Diagnostic Assessor**
University of Louisville Psychological Services Center
- Conducted advanced placement testing and assessments for children. Clinical interviewing, administration of standardized testing, one-on-one supervision, and chart review/clinical report writing.
- Supervisor: Bernadette Walter, Ph.D.

2014- 2015 **Diagnostic Assessor**
University of Louisville Mental Health and Aging Lab
- Conducted structured interviews with older adult patients in long-term care to assess for mental illness diagnoses, mood, functioning, and care quality.
- Supervisor: Suzanne Meeks, Ph.D.

2013-2015 **Psychotherapist**
University of Louisville Psychological Services Center
- Provided Cognitive-Behavioral Therapy with adult clients.
- Supervisor: Janet Woodruff-Borden, Ph.D.

PROFESSIONAL MEMBERSHIPS

American Psychological Association (APA)
Division 12, section 2 – Society of Clinical Geropsychology
Division 20 – Adult Development and Aging
Division 44 – Society for the Psychological Study of LGBT Issues
Gerontological Society of America

PROFESSIONAL SERVICE AND LEADERSHIP EXPERIENCE

2017 **Student Representative**
Council of Professional Geropsychology Training Programs

2015-2017 **Student Representative to Faculty**
University of Louisville

HONORS AND AWARDS

2017 Excellence in Professional Service –University of Louisville
2017 Carol A. Schutz Student Travel Stipend
2014 Gerontological Society of America – BSS Student Travel Award
2010 Society for the Advancement of Behavior Analysis student grant
2007 HammondCare Graduate Research Scholarship

RESEARCH EXPERIENCE

2017-2018 **Clinical Researcher**
VA Boston Healthcare System
- *Training Home-Based Primary Care Teams to Improve Suicide Prevention Practices*
  - Development of training module, editing of toolkit, measuring outcomes, presentation at conference
  - Supervisor: Michelle Mlinac, Ph.D.
- *Mental Health Care for LGBT Population in Long-Term Care*
  - Data analysis, manuscript write-up, presentation at conference
  - Supervisor: Kate Hinrichs, Ph.D.

2017-2018 **Clinical Researcher**
University of Louisville

- *Screening Older Adults For Depression: The Relationship Among Clinical Discipline Training, Barriers, Attitudes, Norms, And Perceived Behavioral Control*
- Dissertation study. Completed.
- Graduate Advisor: Suzanne Meeks, Ph.D.

2015-2016 **Clinical Researcher**
University of Louisville
- *Individualized music therapy for affect, agitation, and engagement in older women with dementia*
- Conducted observational assessments of residents, provided tailored intervention of preferred music. Organized and analyzed data.
- Graduate Advisor: Suzanne Meeks, Ph.D.

2015 **Clinical Researcher**
University of Louisville
- *Mental Health Provider Knowledge of and Interest in LGBT Issues in Nursing Homes*
- Designed survey items, analyzed data, write up
- Graduate Advisor: Suzanne Meeks, Ph.D.

2014-2015 **Clinical Researcher**
University of Louisville
- *Health and Insurance Status of Kentuckians Aged 45-64*
- Created survey items, assessed participants' health insurance status, physical and mental health status, and decision-making around health.
- Graduate Advisor: Suzanne Meeks, Ph.D.

2013-2015 **Clinical Researcher**
University of Louisville
- Flourishing Study
- Conduct structured interviews with older adult patients in long-term care. Assessments include mental health diagnoses, affect, functioning, and care quality. Organize and analyze data.
- Graduate Advisor: Suzanne Meeks, Ph.D.

2011-2013 **Expert Advisor and Collaborator**
Alzheimer's Australia National Quality Dementia Care Initiative Grant
- Developed web-based suite for the Integrated Care Framework for Advanced Dementia (ICF-D). Includes interactive materials and audio-visual resources to assist

care staff and families to provide best practice, evidence-based palliative care for people with advanced dementia.
- Supervised by: Dr. Meera Agar

2011-2012 **Research Officer**
Palliative Care Dept., Braeside Hospital
- *End of Life Care Projects*
- Wrote up project results for Integrated Care Framework for Advanced Dementia and disseminated results of the End of Life Care Projects. Assisted with grant applications.
- Supervisor: Dr. Meera Agar

2010-2011 **Data Analyst**
Palliative Care Dept., Braeside Hospital
- *End of Life Care Projects*
- Analyzed data for two End of Life Care Projects integral to the development of an Integrated Care Framework for Advanced Dementia (ICF-D).
- Supervisor: Dr. Meera Agar

2010-2011 **Clinical Researcher**
University Of Sydney
- *Video Simulated Presence Study*
- Piloted family recorded videos as a means of simulating their presence to a relative with severe dementia to increase positive affect and engagement, decrease negative affect and resistance to care.
- Supervisors: R. Mark Mathews, Ph.D., Meredith Gresham

2010 **Clinical Researcher**
- *Gaps Between Research Theory and New Building Designs*
- Conducted environmental audits of 5 newly-built dementia care settings using the Environmental Audit Tool.
- Supervised by: Assistant Professor Richard Fleming

2009-2011 **Research Assistant**
University of Technology Sydney (UTS)
- Person-Centered Care Study (PerCEN)
- Conducted environmental audits and person-centered care surveys at 40 aged care facilities in New South Wales.
- Supervised by: Lynnette Chenoweth, Ph.D. Richard Fleming, Ph.D.

2008-2009 **Research Assistant**
HammondCare
- *Reliability and Validity of the Environmental Audit Tool*

- Audited 30 aged care facilities across greater Sydney with EAT, TESS-NH and Stirling Environmental Audit Tool for a validation study.
- Supervisor: Richard Fleming, Ph.D.

2007–2009 **Clinical Researcher**
University Of Sydney

- *Pre- and Post-occupancy Evaluation of New Dementia Care Cottages*
- Assessed engagement, distress, and staff-resident interaction of 55 residents with dementia who transitioned to new, purpose-built dementia cottages.
- Supervisors: R. Mark Mathews, Ph.D., Meredith Gresham, Ph.D.

PUBLICATIONS

Smith, R., Fleming, R., Chenoweth, L., Jeon, Y. H., Stein-Parbury, J., & Brodaty, H. (2012). Validation of the Environmental Audit Tool in both purpose-built and non-purpose-built dementia care settings. *Australasian journal on ageing*, *31*(3), 159-163.

O'Connor, C. M., **Smith, R**., Nott, M. T., Lorang, C., & Mathews, R. M. (2011). Using video simulated presence to reduce resistance to care and increase participation of adults with dementia. *American journal of Alzheimer's disease and other dementias*, *26*(4), 317-325.

Smith, R., Mathews, R. M., & Gresham, M. (2010). Pre-and post-occupancy evaluation of new dementia care cottages. *American journal of Alzheimer's disease and other dementias*,*25*(3), 265-275.

AD HOC STUDENT PEER REVIEWER

The American Journal of Alzheimer's Disease and Other Dementias
Mental Health and Aging
Clinical Gerontologist

PROFESSIONAL POSTER PRESENTATIONS AND SYMPOSIA

Smith, R.W., Altman, J., Meeks, S. & Hinrichs, K.L.M. (November, 2018). *Mental Health Care for LGBT Persons in Long-Term Care: A Survey of Mental Health Providers*. In K. Hinrichs, (Chair). Culturally Competent Palliative and End-of-Life Care for LGBT Older Adults. Symposium submitted for presentation at the annual Gerontological Society of America Convention, Boston, MA.

Smith, R.W. & Meeks, S. (November, 2018). *Screening Older Adults For Depression: The Relationship Among Discipline, Barriers, Attitudes, Norms, And Control*. Poster submitted for presentation at the annual Gerontological Society of America Convention, Boston, MA.

Schwabenbauer, A., Mlinac, M., **Smith, R**.,Knight, C., Nothern, A., Morreale-Karl, M. (November, 2018). *Implementing a Whole Health model in Home-Based Primary Care: Strengths, Challenges and Opportunities for Growth.* Poster submitted for presentation at the annual Gerontological Society of America Convention, Boston, MA.

Smith, R., Altman, J., Meeks, S. (July, 2017). *Mental Health Care and the LGBT Population In Long-Term Care: Competency, Training, and Barriers.* (Poster). International Association of Gerontology and Geriatrics Meeting. San Francisco, CA USA

Smith, R., Andrew, N., Reyes, R., Shryock, K., Hodges, L., Hart, A., Davis, H., Meeks, S. (November, 2016). *Individualized music therapy for affect, agitation, and engagement in older women with dementia.* (Poster). Gerontological Society of America 69th Annual Scientific Meeting. New Orleans, LA USA

Smith, R. W., Ludwin, B. M., Reyes, R., Andrew, N., Meeks, S. (November, 2015). *Mental Health and Service Utilization or Avoidance In a Pre-Medicare Sample.* (Poster). Gerontological Society of America 68th Annual Scientific Meeting. Orlando, FL USA

Ludwin, B. M., Mast, B. T., **Smith, R.**, Andrew, N., Reyes, R. A., & Meeks, S. (November, 2015). *Hope, Cognition, and Depression as Related to Quality of Life in Nursing Home Residents.* (Poster). Gerontological Society of America 68th Annual Scientific Meeting. Orlando, FL USA

Andrew, N., Ludwin, B.M., **Smith, R.**, Reyes, R.A., & Meeks, S. (November, 2015). *The Relationship between Social Support and Quality of Life in Newly Admitted Long-Term Care Residents.* (Poster). Gerontological Society of America 68th Annual Scientific Meeting. Orlando, FL USA

Reyes, R.A., Andrew, N.D., **Smith, R.W.**, Midden, A., Ludwin, B., Mast, B., Meeks, S., (November, 2015). *Community Nursing Home as a Clinical Training and Consultation Laboratory for Studying Behavioral Interventions.* (Symposium). Gerontological Society of America 68th Annual Scientific Meeting. Orlando, FL USA

Smith, R., Meeks, S. (2014, November). *Characteristics of late-life depression in nursing home patients related to time of onset and recurrence.* (Poster).

Gerontological Society of America 67th Annual Scientific Meeting. Washington, DC USA

Smith, R. (2012, August). *Pre- and postoccupancy evaluation of dementia care cottages.* (Poster). 120th annual American Psychological Association convention. Orlando, FL USA

Smith, R., Campbell, A., Lorang, C., Mathews, M., & O'Connor, C. (2010, November) *Video technology and simulated presence to assist in dementia care.* Australian Association of Gerontology, Hobart, TAS. Australia

Smith, R., & Mathews, R. M. (2009, May). *Pre and post-occupancy evaluation of dementia care cottages.* Association for Behaviour Analysis International annual convention, Phoenix, AZ. USA

Smith, R., & Mathews, R. M. (2009, May). *Meta-analysis of dementia care mapping.* Association for Behaviour Analysis International annual convention, Phoenix, AZ. USA

Smith, R., & Mathews, R. M. (2009, May). *How the environment effects depressed residents with dementia.* 5th National Conference on Depression in the Elderly, Sydney, NSW. Australia

Smith, R., & Mathews, R. M. (2008, November). *Evaluation of resident behaviour in new dementia care cottages.* Australian Association of Gerontology, Perth, WA. Australia

Smith, R., Mathews, R. M., & Gresham, M. (2008, September). *Pre- and post-occupancy evaluation of dementia care cottages.* National Dementia Research Forum: Translating Research into Practice. Sydney, NSW. Australia

TEACHING EXPERIENCE

2013 – 2017 **Graduate Teaching Assistant**
University of Louisville, Louisville, KY
- Courses: **Advanced Statistics I**; **Advanced Statistics II**; **Test and Measurement**; **Quantitative Methods in Psychology**

2008-2012 **Graduate Teaching Assistant**
University of Sydney
- Courses: **Rural Health**; **Health Science and Research**; **Foundations of Health Science**; **Health Care Resources and Systems**

REFERENCES

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