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Initiation of Standardized Depression Screening in College Health: A Quality Improvement Project

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Abstract

Background: Depression is a leading health concern in college health. An on-campus health clinic was identified as conducting complaint-based screening. U.S. Preventative Services Task Force recommends standardized screening in all primary care settings. **Objective**: To implement a quality improvement project for standardized screening and referral of depressive symptoms and identify factors related to mentoring program interest in a college health clinic. **Methods**: Demographic survey and Patient Health Questionnaire-2 were distributed to students who met inclusion criteria. Positive screens received further intervention with Patient Health Questionnaire-9 and immediate evaluation, encouragement of follow-up, or educational handout. **Results**: Of students receiving primary care services at a college health center, 221 completed demographic surveys, 165 completed the PHQ-2, and 8 students received interventions for positive screens. Furthermore, 74.6% of students expressed interest in a mentoring program. **Conclusions**: The project demonstrates ease of standardized screening in the college health setting without excessive burden to staff or budget. This is a critical preventative care measure for improving early detection and management of depression at college health centers. **Implications:** Initiation of standardized screening on college campuses is a worthwhile investment and should be implemented by registered nurses (RNs) and advanced practice nurses. Support program initiation should be considered to help students with unmanaged symptoms.

Keywords: depression; standardized screening; suicide prevention; college health

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Depression is an ongoing and worsening issue in the college-aged population. Ninety five percent of college counseling centers agree that the number of students on campus with significant psychological problems is a growing concern, and depression is the second most commonly presenting condition (36.4%) (American Psychological Association [APA], 2013). Additionally, suicide is a leading cause of death among college students in the United States. As many as 8% of college students have seriously considered suicide in the past 12 months (Suicide Prevention Resource Center, 2014). A change in practice from complaint-based to standardized screening can promote earlier identification of symptomatic students and reduce long-term sequelae. Untreated depression can lead to physical and emotional problems such as: (a) pain and physical illness, (b) substance abuse, (c) relational difficulties, (d) social isolation, (e) self-mutilation, (f) increased hospitalizations, (g) premature death, (h) academic difficulties, and (i) suicidal/homicidal ideations (Mayo Clinic, 2017). Early identification, referral, and treatment reduces risk of complications, improves coping skills, and decreases costs (Mayo Clinic, 2017).

Background & Significance/Problem Statement

An identified college health center (HC) utilized a complaint-based screening approach where students were screened for depression only if they presented with depression-related complaints (suicidality, sadness, extreme fatigue, anhedonia, etc.). This is inconsistent with the U.S. Preventative Services Task Force (USPSTF) recommendation to screen all patients, regardless of reason for the visit (Sui & USPSTF, 2016). The nature of depression-related symptoms (DRS) prevents patients from seeking care for their symptoms, making it important to

conduct standardized rather than complaint-based screening for optimal detection. In the past four years, the number of mental health (MH) visits conducted by the HC rose nearly 300%.

According to the Association for University and College Counseling Center Directors (AUCCCD) Annual Survey, 95% of college counseling center directors agree that significant psychological issues are a growing concern on their campus (AUCCCD, 2013). Many students take medical leave without returning to complete their program; a significant loss of revenue for the college and financial loss for students who have debt, but no degree. Seventy seven percent of medical leaves in last three years were related to MH issues, many of which were the result of delayed diagnosis or treatment. Faculty note that students were struggling academically, despite being more intellectually prepared. Many of the struggling students admitted to recognition of DRS but refused to seek help due to the perceived stigma. Additionally, students who received services for depression continued to express concerns related to symptom management.

The overall purpose of this project was to initiate a standardized screening and referral process for depression in students at a college-based HC to reduce the incidence of untreated depression on a college campus. A population intervention comparison outcome (PICO) question was developed: In college-aged students receiving care at a student HC, will the initiation of a valid and reliable depression screening tool, when used by the advanced practice nurse for screening, referral, and follow-up, effectively increase the identification of students with depression to initiate treatment which can reduce suicide attempts, improve academic performance, and provide cost savings, when compared to the current practice of complaint-based screening? A secondary aim of this project was to identify demographic factors to guide future research regarding interest in campus-wide programming or mentoring to improve student outcomes and wellbeing.

Literature Review

A comprehensive review of literature and article reference lists was conducted using CINAHL, PubMed, Medline, Cochrane Library, PsycINFO, and Google Scholar for articles from 2011-2017. Seventeen studies resulted, all of which demonstrated the need to increase screening for emotional distress and improve awareness of the need for services to the college-aged population. A gap between the current state (poor depression screening rates) and the desired state (improved screening and depression detection rates) was consistently noted.

Several valid and reliable tools were used to screen for depression, which demonstrated effectiveness in one or two tiered approaches (Beiter et al., 2015; Chung et al., 2011; Kanuri, Taylor, Cohen, & Newman, 2015; Lyoo, Ju, Kim, Kim, & Lee, 2014). Mass or standardized screening, rather than complaint-based screening, was preferred due to generally low detection rates across campuses for standard practice (Khubchandani, Brey, Kotecki, Kleinfelder, & Anderson, 2016; Mackenzie et al., 2011). Early initiation and treatment reduces deleterious health effects and should be encouraged (Klainin-Yobas et al., 2014; Klein, Ciotoli, & Chung, 2011; Mahmoud, Staten, Hall, & Lennie, 2012). The use of in-office screening and education is preferred over online tools (Eisenberg, Hunt, Speer, & Zivin, 2011; Youn et al., 2012), and senior administrative support is critical to program success for screening and early intervention (Chung et al., 2011).

The PHQ-2 and PHQ-9 surveys were selected to maintain consistency with the current screening methodology of the clinic. Appropriate cut points were determined based on the review of literature and desire to improve specificity over sensitivity (Kroenke, Spitzer, & Williams, 2001; Kroenke, Spitzer, & Williams, 2003). Clinical practice guidelines and professional organization recommendations were identified to guide the intervention and referral

process for positive screens (Sui & USPSTF, 2016; Trangle et al., 2016; UHC Community Plan, 2016).

Theoretical and Conceptual Framework

The IOWA Model of Evidence Based Practice to Promote Quality Care was identified to guide the incorporation of research evidence, clinical expertise, and patient values during the translation of evidence into practice (Titler et al., 2001). This QI model combines problem and knowledge focused triggers with organizational and collaborative efforts to seek improvement based on research findings. It also clarifies necessary steps for the application of research into practice with the goal of improved quality of care (Hall & Roussel, 2014).

Pender's Health Promotion Model was used to guide and inform the scholarly project with a focus on three areas: (a) individual experiences and characteristics, (b) behavior-specific cognitions and affect, and (c) behavioral outcomes (Petiprin, 2016). This principle allowed individuals to incorporate previous experiences or behaviors into interventions for positive screening by choosing lifestyle modifications, consideration of pharmacotherapy, or counseling. Intended interventions could be followed-up by campus or primary care provider (PCP) staff. Holistic well-being was promoted by screening for MH related concerns during appointments for physical health complaints, empowering students with the awareness of DRS and autonomy in decision making, which improves self-efficacy and reduces perceived barriers associated with initiation of care for depression.

Methods

Sample

All students with NP appointments at the HC were recruited for participation. Most students were traditional college-aged males and females (ages 18-22). Inclusion criteria were

students enrolled at Messiah College who presented for a non-MH related NP appointment and were over 18 years of age, willing to participate, and able to read and understand English. Exclusion criteria included age under 18 years and presentation for a RN, counseling center, or MH-related appointment. Students who presented for non-provider appointments were excluded due to lack of ability to follow-up on positive findings without an NP appointment. Students with MH related complaints were already being screened with the PHQ-9, thus excluded from this study.

Eligible patients were brought to a private exam room and the demographic questionnaire and PHQ-2 survey were explained by the intake nurse after obtaining informed consent. The demographic survey was completed (n=221) and students who were not currently receiving any treatment for depression (counseling or medication, on or off campus) proceeded to the PHQ-2 (n=160). If the PHQ-2 score was positive (>3), the student completed the PHQ-9 (n=8). Scores were calculated and referral and algorithm decisions were made by the NP. Students who were already receiving depression-related treatment completed the demographic survey only; PHQ-9 scores were obtained as necessary to evaluate severity of symptoms, response to treatment, and level of improvement but were not included in the analysis.

Setting

The setting was a student HC with medical and counseling services located on the campus of a small, liberal arts, Christian college. The medical center was staffed by one master's prepared family NP and eight RNs. Three exam rooms were used and noise contamination was an issue. Sound machines and radios were used in patient rooms and common spaces to improve confidentiality. The waiting room was separate and screening was conducted in exam rooms to facilitate explanation and ease of answering questions.

Tools

The PHQ-2 tool was used for initial screening and PHQ-9 tool for further evaluation. Demographic data was collected to assess risk factors for depression across campus (level in school [first year, sophomore, junior, senior, graduate], major, history of MH, current treatment for depression, and mentoring program interest). The PHQ-2, an abbreviated version of the PHQ-9 has demonstrated validity and reliability as a screening tool only, not diagnostic, at a variety of cut points. A meta-analysis by Manea et al. (2016) demonstrated pooled sensitivity of 76%, pooled specificity of 87%, pooled likelihood ratio of 6.02, pooled negative likelihood ratio of 0.27, and pooled diagnostic odds ratio of 22.20. Criterion validity was demonstrated in concordance with MH professional interviews at a cut point of 3 or greater and was comparable to the PHQ-9 for depression (kappa 0.48-0.62 versus 0.54-0.58). Construct validity was established by strong association between PHQ-2 scores and disability days, functional status, and symptom-related difficulties, making it an appropriate tool to use as a first step approach to depression screening (Kroenke, Spitzer, & Williams, 2003). Reliability and validity of the PHQ-9 has been widely established by multiple independent assessments. Diagnostic validity of the PHQ-9 demonstrates a sensitivity of 88% and specificity of 88% for scores greater than ten. Internal consistency is also high with Cronbach alphas of 0.86 and 0.89 (APA, 2018).

Screening and referral algorithms

Students with a negative score on the PHQ-2 (<4) or PHQ-9 (<10) received a printed educational handout from the National Institute of Mental Health (2017). For PHQ-9 scores >10, a follow-up visit was strongly encouraged (on or off campus, provider or counselor based) and an educational handout was provided via the patient portal. For scores $\geq$20 on the PHQ-9 or >0 on the suicide question (#9), the provider evaluated DRS during the current appointment.

Data collection

Data was collected January-March 2017 (n=221) via paper survey. This included a de-identified demographic survey, PHQ-2 scores, and PHQ-9 scores as indicated based on the algorithm. PHQ-2 and PHQ-9 surveys were scanned into the student's electronic health record and numeric score recorded on the demographic survey. The principle investigator did not have access to any patient health record. Involved staff received training on project implementation regarding the administration, scoring, and follow-up of the survey, tool, and algorithm (Figure 1).

Institutional Review Board approval

All collected data were de-identified, hence IRB exemption was obtained through the University of South Alabama and Messiah College, location of the student HC. All participants were provided an information script and informed consent was obtained prior to data collection.

Results

Results were aggregated using the Statistical Package for Social Science (SPSS) IBM Version 24.0 for MacOS. The analysis focused on the frequencies and relative frequencies of various PHQ-2 and PHQ-9 scores and mentoring interest and preferences as a whole as well as when compared across various demographic measures such as class level, major/school, and MH history. PHQ-2 scores ranged from 0 to 6 and PHQ-9 scores ranged from 0 to 24 (Table 1). On the PHQ-2, 3.7% of students screened positive (n=8), 68.5% screened negative (n=148), and 27.8% were already receiving an intervention for a MH condition (n=61). Furthermore, 2.3% of students had a PHQ-2 of three (n=5), an alternate cut point for further evaluation. All students with positive PHQ-9 scores received further interventions. The only statistically significant risk factor for depression was a history of MH illness ($p=<0.05$) (Table 2 and 3). No statistically

significant relationships were identified between PHQ scores and level in school, major, or timing in semester. Lack of statistically significant findings is likely due, in part, to the low positive detection rate.

In general, 76.4% of students (n=169) expressed definite or possible interest in a mentoring program to manage stress, anxiety, or depression. Of this group, 10.2% were interested only if a program was major specific (n=23) and 25% noted possible interest (n=55). Interest in a mentoring program varied by school. All participants from the School of the Arts (departments of music, theater and dance, and visual arts) expressed definite or possible interest in a program (n=19). Participants in the School of Science, Engineering, and Health were most likely to be interested in a major-specific program (17.4% vs 4.1-6.3%) (Figure 2). More specifically, nursing (22.7%) and engineering (13.6%) majors were most likely to be interested in a major-specific program rather than a non-major specific program.

Discussion

Eight students had positive PHQ-2 scores (>3) and were further screened with PHQ-9. Seven had positive PHQ-9 scores (>10 of >0 on question #9) and received interventions (immediate evaluation [n=5] or patient education hand-out and encouragement to schedule follow-up [n=2]). Approximately 28% of participants were already receiving an intervention for depression. With the national rate of depression in college students estimated around 30-36% (APA, 2013), the HC is already identifying and/or treating most symptomatic students.

There were no major difficulties with program implementation. However, the survey plus screening were costly of time (approximately 2 to 7 minutes). Process improvements could significantly lessen staff time. The relatively low detection rate makes it difficult to assess fully the requirements for provider time. A high number of positive PHQ-9 screenings could

significantly increase the burden for staff, especially if immediate evaluation and treatment initiation was required. Elimination of the demographic survey and distribution of paper or electronic PHQ screening at check-in could significantly lessen staff burden.

HCs with less emphasis on reducing MH stigma may have more need to identify symptomatic students through standardized screening. The potential negative consequences for untreated depression make continuation an imperative component of preventative care, regardless of the low detection rate. With suicide, even one prevention makes the endeavor worthwhile.

Mentoring or support program initiation may be a helpful component of depression management in the college health setting. Despite the current detection rate, the high percentage of students with mentoring interest suggests that identified students may have undermanaged symptoms. This could be related to the high volume of requests for MH appointments and a one-provider HC; 40% of NP visits were identified as MH and a wait list existed for counseling and medical services. Additionally, students may prefer to attend sessions with peers or receive support for stress or anxiety without the need for individual counseling. Potential benefits include coping and stress management education, increased depression awareness among students, and reduced burden for provider or counseling appointments. Further interest evaluation should be completed to assess details related to group composition and program content.

The correlation between MH history and current symptomatology suggests that identifying students with MH history upon admission to the college may help provide services prior to worsening symptoms. Implications for faculty or residential life staff working with first year students could include education related to self-screening on the HC website.

Confidentiality concerns exist for screening in the classroom, dormitory, or learning management system. Future studies should also explore the relationship of mentoring program interest by major or school to determine if these programs should be initiated by the HC, counseling center, faculty, residential life staff, student-run organizations, or outside affiliations. A potential opportunity exists for interprofessional collaboration with graduate level counseling students and faculty.

Limitations

Students were screened from January to March, excluding the second half of the Spring semester, which may have impacted findings and could contribute to the low number of positive screens. Continuation for a full semester or year may improve reliability of findings. One possible theory is that rates of situational depression may be higher at the end of the semester with the stress of finals week, summer plans, moving, and seeking employment. Additionally, students who scored 10-20 on the PHQ-9 were strongly encouraged to schedule a follow up appointment to discuss their symptoms. Adherence to follow-up was not tracked. Future studies to investigate the percentage of students who follow through could prove useful for knowing if outcomes would improve with immediate evaluation for any positive PHQ-9 score.

Another limitation was that of demographic data collection. This study failed to include gender and race in the demographic portion of data collection, a potentially significant finding for outcome evaluation. During data collection, staff noted an anecdotal increase of international students seeking MH services; therefore, this variable should also be explored in future studies.

The findings of this study indicate a relatively high number of students (29.4%) already receiving intervention(s) for depression. This is fairly consistent with the national rates of students expressing concerns for depression (APA, 2018). A gap of only 6% indicates that this

HC has already targeted most students with DRS. Repeated screening at additional college HCs or centers with larger populations may yield higher detection rates and is recommended.

Lastly, data collection only occurred in students who presented for an NP appointment, greatly limiting the number of students screened. More significantly, the symptoms of depression related to decreased energy, interest, and fear of stigma may prevent depressed students from seeking any type of care. A more thorough screening process outside of the HC may demonstrate a higher positive detection rate.

Conclusions

In total, eight students had positive PHQ-2 scores and were further screened with PHQ-9. Seven of these students had positive PHQ-9 scores and received interventions for newly identified DRS. Though the collection of demographic survey plus PHQ screening was costly of time, the number of newly identified students was low. Despite the detection rate, the high percentage of students interested in a mentoring program suggests that, although identified, students may still have undermanaged symptoms. Future studies should explore components of the mentoring program interest by major.

Nonetheless, the relative ease of PHQ-2 and PHQ-9 screening makes continuation a worthwhile investment at college HCs. Early identification remains an important component of depression management and prevents further complications of untreated symptoms. Additional studies should assess the generalizability of these findings to other institutions and the feasibility of application to larger HCs or those with less emphasis on depression management.

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Tables & Figures

Table 1. PHQ-2 Frequencies.

		Frequency	Percent	Valid Percent	Cumulative Percent
PHQ-2 scores	.00	81	37.5	37.5	37.5
	1.00	42	19.4	19.4	56.9
	2.00	20	9.3	9.3	66.2
	3.00	5	2.3	2.3	68.5
	4.00	6	2.8	2.8	71.3
	5.00	0	0	0	71.3
	6.00	2	.9	.9	72.2
	N/A	60	27.8	27.8	100.0
	Total	216	100.0	100.0	

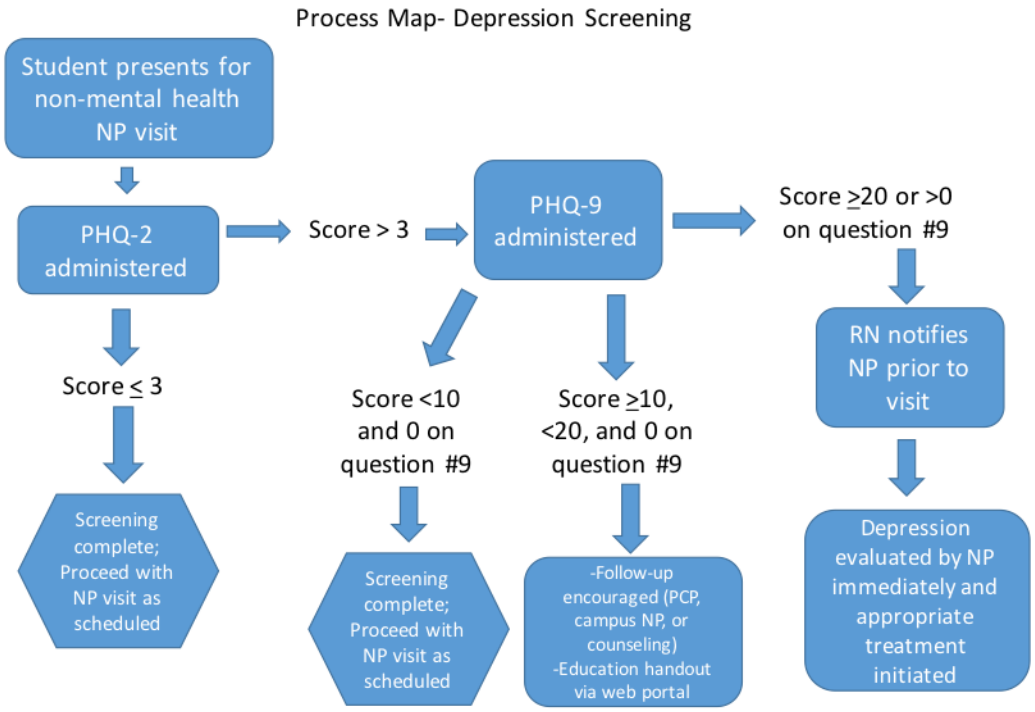
Table 2. Mental health history compared with PHQ-9 score category.

		PHQ9 Category				
		Negative	Follow up	Intervention	N/A	Total
Mental Health history	No	3	5	1	110	119
	Anxiety	28	7	3	51	89
	Depression	0	2	1	5	8
	Eating disorder	0	0	0	2	2
	Bipolar	0	0	1	0	1
	Other	0	0	0	1	1
	Total	31	14	6	170	221

Table 3. Chi-Square tests of mental health history compared with PHQ-9.

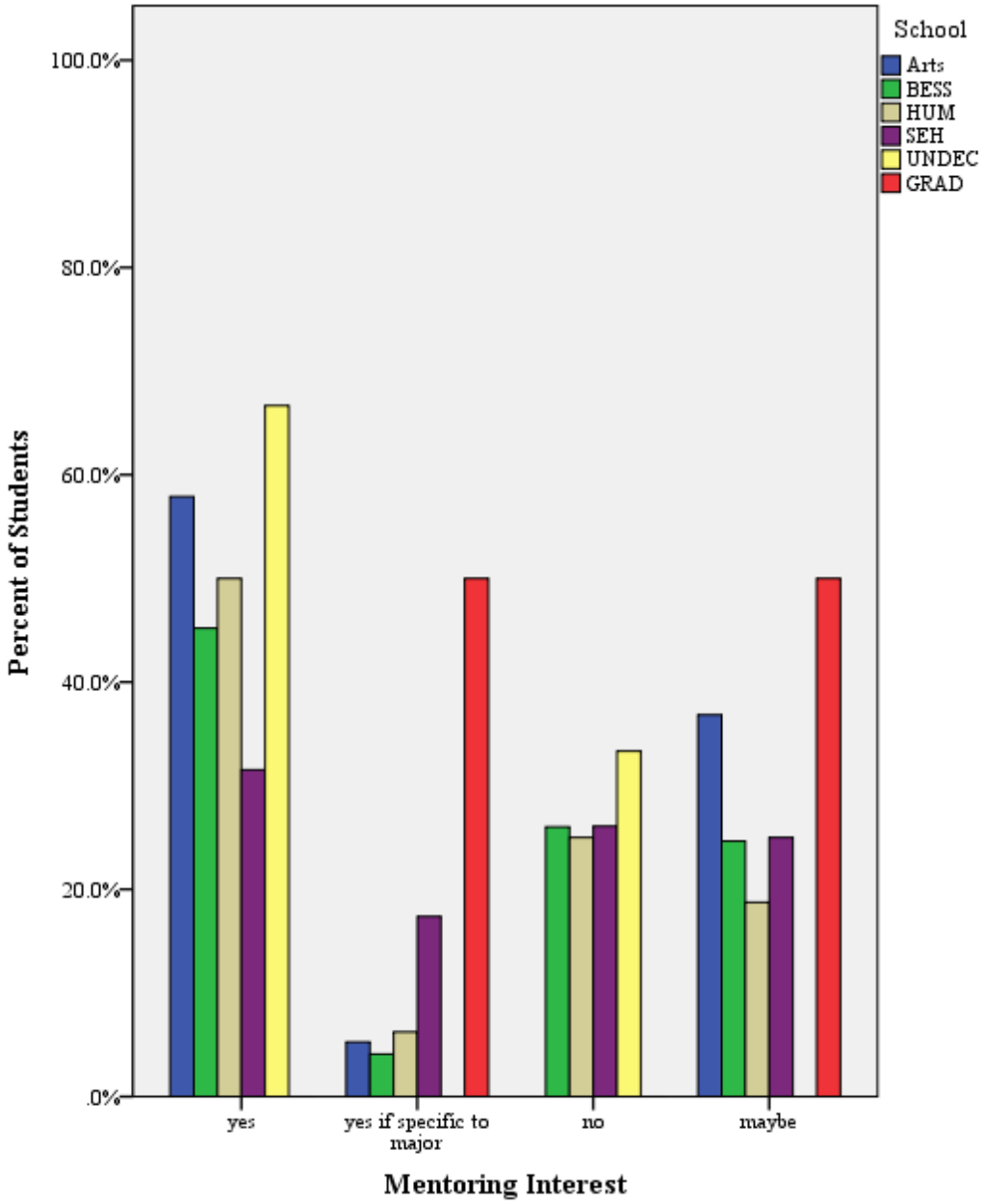
	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	87.150	18	.000
Likelihood Ratio	58.978	18	.000
Linear-by-Linear Association	19.848	1	.000
N of Valid Cases	221		

Figure 1. Process map.



Note: RN=registered nurse; NP=nurse practitioner; PCP= primary care provider.

Figure 2. Percentage of students interested in mentoring programs by school.



Note: Arts= School of the Arts; BESS= School of Business, Education, and Social Sciences; HUM= School of the Humanities; SEH= School of Science, Engineering, and Health; UNDEC= undeclared major. GRAD= School of Graduate Studies.