USING SCREENING, BRIEF INTERVENTION, REFERRAL TO TREATMENT TO ADDRESS PROBLEMATIC ALCOHOL USE AT A UNIVERSITY STUDENT HEALTH CENTER

A Scholarly Project

Submitted to the

Faculty of Liberty University

In partial fulfillment of

The requirements for the degree

Of Doctor of Nursing Practice

By

Tajuane Horton Dockery

Liberty University

Lynchburg, VA

May 10, 2020

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Scholarly Project Chair Approval:

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[redacted] Date

ABSTRACT

Problematic drinking is a public health concern on college campuses. College students who do not have their risky drinking behaviors addressed are at greater risk for developing Alcohol Use Disorder (AUD). Despite known risks associated with drinking on college campuses, many college health centers miss an opportunity to address these behaviors because they lack a systematic process for identifying students at risk and referring them for treatment. This evidence-based project evaluated the effectiveness of using Screening, Brief Intervention, Referral to Treatment (SBIRT) to identify students with risky drinking behaviors and the impact the screening process had on facilitating a referral to treatment. Students (n=172) were screened using the Alcohol Use Disorders Identification Test- Consumption (AUDIT-C), as part of the check-in process when they presented for a wellness exam at a university student health center in the southeastern United States. Students' drinking behaviors were categorized as low-risk, at-risk or high-risk based on their AUDIT-C scores. Outcome measurement results indicated that use of a systematic process for screening students for alcohol use was effective at identifying students with risky drinking behaviors, provided a structured process to giving students feedback about their drinking behaviors and facilitated a referral to treatment for those students who scored in the high-risk category.

Keywords: SBIRT, AUDIT-C, alcohol use, college students, screening, randomized-control trial

Dedication

This is dedicated to my amazing parents! I am grateful for my dad who always told me I was smart enough to be a doctor. Thank you for believing in me and always challenging me to work at my highest potential. Though you are not here to physically share in this accomplishment with me, I know you are in heaven looking down with a smile. Thank you to my mom. I am grateful for your encouragement and all of your prayers. Your support is unwavering and that means the world to me. You both taught me to put God first and everything else would fall into place and you were right!

Acknowledgements

First, I am so grateful to God; only His grace and mercy has sustained me along this journey. I am thankful for the amazing support system He has provided me. Thank you to my husband who was always there to encourage me through every challenge and moment of self-doubt. Your constant prayers, never-ending patience and willingness to pick up the pieces each time I felt broken, sustained me through it all. Thank you to my daughter and son for your encouragement and just being you! My desire to show you that you can accomplish great things always drives me to work hard and finish strong.

A huge thank you to Student Health Services at the [redacted], especially Dr. [redacted], Executive Director, Dr. [redacted], Director of Strategic Health Initiatives, and the Women's Health staff. Dr. [redacted], thank you for supporting me through my academic endeavors. Dr. [redacted], thank you for your guidance on this project and sharing your expertise. To the Women's Health staff, thank you for your willingness to be the first department to pilot this new screening process and the valuable feedback you provided throughout the process.

I would also like to thank Dr. [redacted], Scholarly Project Chair. I appreciate all of the guidance and support you provided. Thank you for always being available and providing invaluable insight that helped to bring this project to fruition.

Words cannot express my gratitude to all of you for your contributions!

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Abbreviations

Alcohol Use Disorder (AUD)

Alcohol Use Disorders Identification Test—Consumption (AUDIT-C)

Electronic Health Record (EHR)

Evidence-Based Practice (EBP)

Interdisciplinary Team (IDT)

Point and Click (PnC)

Screening, Brief Intervention, Referral to Treatment (SBIRT)

Student Health Services (SHS)

Substance Abuse and Prevention Education (SAPE)

Women's Health (WH)

SECTION ONE: INTRODUCTION

Excessive drinking, characterized by the Centers for Disease Control and Prevention [CDC], (2018) as binge drinking (4 drinks for women or 5 drinks for men per occasion) and/or heavy drinking (8 drinks for women or 15 drinks for men per week) can lead to chronic disease, unintentional injuries, and violence. In 2017, 26.4% of adults age 18 and older reported binge drinking and 6.7% in this same group reported heavy alcohol use (National Institute of Health, National Institute on Alcohol Abuse and Alcoholism [NIAAA], 2018). Frequent heavy drinking can lead to physical and emotional illness and increases the risk of developing Alcohol Use Disorder (AUD) (Alcohol Rehab Guide, 2019).

The NIAAA (2019) described AUD as a chronic disease manifested in a compulsive use of alcohol that leads to negative emotions when not drinking and loss of control impacted by how much one drinks. They further stated that AUD affects approximately 14.1 million adults in the United States (NIAAA, 2019). In the United States in 2010, the economic burden of alcohol misuse cost $249 billion, and results in approximately 88,000 deaths annually (NIAAA, 2019).

Millions of college students are affected by problematic drinking each year (Alcohol Rehab Guide, 2019) but alcohol consumption is commonly normalized as part of the college experience (Farmer, Powell, Treitler, Peterson, & Borys, 2019). Consequently, if hazardous alcohol consumption is not detected during the college years and addressed, it could progress to AUD. Efforts must be made to identify and address risky- drinking behaviors to facilitate a referral and treatment, to achieve more positive outcomes.

Background

The severity of drinking among American college students is a significant public health concern (Farmer, et al., 2019) as students on college campuses are at an increased risk for

alcohol misuse. Factors like dormitory living, having a roommate and/or membership in a sorority or fraternity are increased risk factors for developing AUD (Farmer et al.). When compared to their non-college age-matched peers, heavy drinking rates were higher among college students (McNeely et al., 2019) with 53% of fulltime college students age 18-22 reporting drinking in the past month, 34.8% admitting to binge drinking and 9.7% to heavy drinking compared to, 49.9%, 33.4% and 9.1% for non-college attending persons of the same age, respectively (NIAAA, 2019). Furthermore, it was estimated that at least 20% of college students have AUD, at least 25% experience poor academic performance as a consequence of drinking and annually, and approximately 1,825 college students die of alcohol-related injuries (NIAAA, 2019).

The United States Preventive Services Task Force (USPSTF) recommends alcohol screening for adults age 18 and older to identify persons with unhealthy alcohol use and providing them with a brief counseling intervention (U.S. Preventative Task Force, 2018). For natural drinking settings, like college campuses, screening and brief intervention (SBI) could potentially reduce alcohol-related problems (Farmer et al., 2019). SBI has been identified as an effective and feasible preventative screening intervention to identify at-risk drinkers among college students (Campbell & Maisto, 2018).

To combat the consequences that result from alcohol misuse, early identification and management of risky alcohol behaviors is critical to promoting well-being and academic success for college students (Miller, Brennan-Cook, Turner, Husband-Ardoin & Hayes, 2018). Research indicated that almost half of college students utilize the services offered at student health centers and overall, students believe that the information provided by student health centers is reliable. This provides a unique opportunity to address risky drinking behaviors and educate students

(McCabe et al., 2019). Screening and brief counseling using motivational interviewing techniques is the recommended intervention to address alcohol use behaviors in the university health care setting (McNeely et al., 2019).

Problem Statement

There has been an increase in alcohol-related hospitalizations among young adults, including undergraduate college students with alcohol-related accidents being among the leading causes of death for this age group (McNeely et al, 2019). Use of alcohol among college students has a negative impact on their health outcomes and overall well-being. Consequences of heavy, excessive drinking among college students are poor academic performance, intimate partner violence, sexual assault and death (Farmer et al, 2019). Therefore, efforts must be made to identify those students most at-risk.

There is an increased likelihood that patients will receive treatment, referral and follow-up for alcohol misuse when it is detected using evidence-based screening techniques (Miller, et al., 2018). Despite this recommendation, many student health centers do not have a systematic process for detection of at-risk drinking behaviors. Regular screening for risky-alcohol behaviors is performed at approximately 1/3 of all four-year institutions and just over 10% of those institutions use a standardized tool (McNeely et al, 2019). Student health centers that have not implemented alcohol screening as a standard practice are considered an under-utilized resource to address risky drinking behaviors and unhealthy alcohol use (McNeely et al., 2019). Student Health Services (SHS) at the site for this project was among those institutions which do not have a standardized practice for assessing alcohol use for students who seek services at the health center.

Purpose of the Project

The purpose of this project was to use an evidence-based methodology to implement alcohol screening at SHS to aid with identifying students with harmful drinking behaviors and initiate a referral to a substance abuse counselor for treatment. Screening, Brief Intervention, Referral to Treatment (SBIRT) is an evidence-based approach to delivery of early intervention for individuals with risky alcohol or other substance use and facilitates timely referral to a specialist for assessment and treatment (Farmer et al, 2019). The Alcohol Use Disorders Identification Test- Consumption (AUDIT-C) - a three-item screening tool - has been validated for use in college students to detect problematic drinking (Campbell & Maisto, 2018) and was used as the screening tool for this project.

Clinical Question

Will implementation of the AUDIT-C at SHS provide a systematic process for identification of students with, or at risk for, AUD and facilitate a referral to treatment?

SECTION TWO: LITERATURE REVIEW

A literature review was conducted to identify and evaluate available evidence to support the efficacy of implementing an alcohol screening approach/intervention at a university student health center. Both qualitative and quantitative research were consulted to determine best practices for assessing organizational readiness, determining cut-off scores to identify risk level and the potential impact SBIRT could have on patient outcomes. This literature review also explored which alcohol screening tool would be most appropriate to use for this patient population.

Search Strategy

The following databases were used to conduct the search: EBSCO, Health Source Nursing Academic Edition, MEDLINE Plus with Full Text, CINAHL Plus with Full Text, PsycARTICLES, Psychological and Behavioral Science Collection, PsycINFO, and PsycTESTS. A combination of the following key terms was used to perform the search of peer-reviewed journal articles published from 2014-2019: college students, alcohol use, screening, AUDIT-C, SBIRT and randomized-control trial. Results yielded 228 peer-reviewed articles. The abstract of each article was read to determine which studies met inclusion criteria and were relevant and applicable to this project.

Critical Appraisal

A total of 25 articles met the inclusion criteria and were chosen based on relevance to this project. Inclusion criteria included peer-reviewed journal articles published in the last five years that evaluated the use of an alcohol screening tool on a college campus and/or the effectiveness of SBIRT with this patient population. These articles were compiled in a matrix summary

format (Appendix A) which was used to organize the findings based on purpose, sample size, methods, results, and limitations of findings.

Melnyk's Level of Evidence was used to assign varying Levels of Evidence, ranging from Level 1 through Level 7, for the 25 articles that met inclusion. These articles included one meta- analysis, four randomized-control trials (RCT), one quasi-experimental study design, seven correlational/cohort studies, three literature reviews, ten descriptive studies, and two expert opinions. All 25 articles were specific to the college/university setting and evaluated the use of alcohol screening to address risky drinking behaviors among this patient population. A limitation identified among the studies was self-reported drinking behaviors can be subject to under and over reporting which can skew outcomes. Additionally, because studies were specific to certain universities and/or geographic locations, results may not be generalizable to the population at large.

Synthesis

The review of the literature revealed substantial evidence that alcohol misuse is prevalent among college students and negatively impacts their overall health and well-being. All 25 articles identified early detection and intervention as critical first steps to addressing this public health concern.

Administration of the alcohol screening via tablet or kiosk was found to be feasible for health centers that chose this route and was widely accepted by students (McCabe et al., 2019). Prior studies evaluated the use of the AUDIT-C screening tool to assess alcohol consumption (Ahmed, Hustad, LaSalle & Bosari, 2014; Blank, Connor, Gray & Tustin, 2015; Campbell & Maisto, 2018; Cortes-Tomas et al., 2017; Davoren, Demant, Shiely & Perry, 2016; Farmer, et al., 2019; Ganz et al., 2018; Hagman, 2016; Kypri et al., 2014; Martin, Chaney & Cremeens, 2015;

Miller et al., 2018; Wahesh & Lewis, 2015). The AUDIT-C was found to be a valid tool for identifying at-risk drinking behaviors in this setting. Research conducted by Bachhuber and Bradley (2016) evaluated the use of clinical decision support (CDS) embedded in Electronic Health Record (EHR) to facilitate use of evidence-based practices to address positive screening scores. Use of CDS was found to be effective at reinforcing the education and training provided to staff regarding Brief Intervention (Bachhuber & Bradley).

Studies conducted by Ganz et al. (2018), Farmer, et al. (2019), Harris and Knight (2014), Jones and Groom (2014), Nunes, Richmond, Marzano, Swensen and Lockhart (2017) and Wahesh and Lewis (2015) provided significant support for the use of SBIRT as a framework to assess problematic drinking. More specifically, in the study by Ganz et al., a randomized-control trial noted improvement in drinking habits among students who received a screening and brief intervention as a result of a positive score on an alcohol screen. Jones and Groom's study explored the development of SBIRT protocols that address individual motives and factors that influence drinking. These protocols were incorporated into this project as well as findings from the study by Nunes, et al. which reinforced an interdisciplinary approach to addressing problematic drinking and ensuring the accessibility of treatment options for providers and patients. This evidence provided a structural framework for implementation and evaluation of the outcomes of this project.

Conceptual Framework

The Iowa Model of Evidence-Based Practice to Promote Quality of Care, often referred to as simply The Iowa Model, was used as the conceptual framework to guide this evidence-based practice scholarly project. Permission was requested and granted for use of the Iowa Model for this project (Appendix B). The Iowa Model provided guidance for problem-solving

using an evidence-based approach to implement multi-phasic changes that are influenced by feedback loops throughout the process (Melnyk & Fineout, 2015). The phases of the Iowa Model include: identifying a trigger; forming an interdisciplinary team (IDT); researching, evaluating and synthesizing the evidence for a practice change; designing and piloting the practice change; integration and sustainability of the practice change; and dissemination of the results (Iowa Model Collaborative, 2017). Feedback loops guide decision-making about whether the trigger is an organizational priority, evidence supports a practice change, the pilot is successful and if the practice change should be integrated organization-wide and is sustainable (Iowa Model Collaborative, 2017). The following outlines how the IOWA Model was applied to this project:

Project Trigger. Problematic drinking is a concern on college campuses because it has a negative impact on students academically, physically and emotionally. Student health centers on university campuses are trusted as reliable providers of care and information and can use their influence to assess, educate and inform students about risky drinking behaviors. The trigger for this project was the lack of a systematic process to screen students who are seen at SHS for risky alcohol-use behaviors. SHS confirmed that implementation of a systematic process to identify and address unhealthy drinking habits aligned with their commitment to promote the overall health and well-being of their students. A letter of support was provided by the Executive Director of Student Health Services (Appendix C).

Interdisciplinary Team Development and Examining the Evidence. An interdisciplinary team (IDT) of key stakeholders from the Medical Services department at the project site was formed. The team consisted of the medical directors from Women's Health (WH), Primary Care and Sports Medicine, and the Director of Strategic Health Initiatives. This

researcher served as the project team leader. The team leader conducted the literature search and review. The evidence/information gathered was presented to the IDT and used to design the practice change.

Practice Change Design and Pilot. The team leader developed a phased roll-out plan (Appendix D) for the implementation of SBIRT to address alcohol use across the Medical Services departments. The Director of Strategic Health Initiatives served as content expert and provided guidance on additional educational resources available to students, and information included in the patient feedback letters. Alcohol screening using the AUDIT-C was implemented in the Spring 2020 semester.

The implementation was piloted in the WH department for one month and, based on initial data analysis, plans were made to progress to phase two of the roll-out following Spring Break. Screening was initiated in Sports Medicine in March and Primary Care in April. Due to the COVID-19 pandemic, students did not return to campus following Spring Break. The lack of students on campus resulted in the project prematurely coming to an end.

Evaluation and Dissemination. Despite concluding the project early, there were enough screenings performed during the initial roll-out phase to determine the impact implementation of the screening had on identifying unhealthy drinking behaviors, and facilitating referrals to treatment for students identified as at-risk. Results of the practice change were evaluated and distributed to the IDT and the WH department. Recommendations for integration of the screening across the other Medical Services departments and sustainability of the practice change were provided to the SHS.

Summary

The purpose of the literature review was to find best practices for screening students for alcohol misuse and implement a systematic approach to facilitate referral. Findings from the literature review supported implementation of an alcohol-screening for students seen at a university health center as the lack of a systematic approach to address alcohol misuse in this patient population could lead to poor academic and health outcomes. The evidence supported the need to implement a systematic approach to address alcohol use in this practice setting. SBIRT provided a firm foundation to address problematic drinking and was facilitated by implementation of the AUDIT-C which has been established as a feasible and acceptable screening tool to facilitate this practice change.

SECTION THREE: METHODOLOGY

Design

The primary aim of this project was to implement a systematic process for screening college students for risky alcohol behaviors using a validated alcohol screening tool. The evidence in the review of literature supported the use of SBIRT to address alcohol consumption in this patient population as well as use of the AUDIT-C as a valid tool to determine problematic drinking. This evidence-based practice project was implemented using the Iowa Model's framework and a quasi-experimental research approach for data collection and analysis.

Measurable Outcomes

The goal of this project was to implement SBIRT, as an evidence-based approach to assessing alcohol consumption. The success of this project was measured by the following outcomes:

1. At least 50% of students seen at the health center in a Medical Services department during the Spring 2020 semester will complete the AUDIT-C.
2. 100% of students who are administered an AUDIT-C screening will receive a follow-up letter providing additional educational information about their score.
3. 100% of students who have a high-risk score on the AUDIT-C will be referred to SAPE for treatment and follow-up.
4. At least a 10% increase in the number of referrals to SAPE as a result of implementing SBIRT to more readily identify risky drinking behaviors.

Setting

This project site was a large university in the southeastern United States. Enrollment at this institution at the time of the study was approximately 30,000 including graduate and

undergraduate students. SHS, located in the center of the campus, embodies the University's commitment to improve quality of life through the promotion of preventative service. SHS has achieved Patient-Centered Medical Home certification through the Accreditation Association of Ambulatory Health Care (AAAHC). SHS provided comprehensive care through a variety services for patients to include Primary Care, Women's Health, Counseling, Psychiatry, Nutrition, Sports Medicine, Sexual Health and Sexual Assault and Violence Intervention and Prevention. The health center employs more than 200 employees to include: physicians, mid-level providers, nurses, medical assistants, counselors, physical therapists, radiology technicians, and pharmacists. The organization is committed to providing evidence-based, patient-centered care to promote well-being. Implementation of this project aligned with the organization's strategic goals.

Population

The targeted audience for this project was students who presented to SHS to be seen in one of the three Medical Services departments -Primary Care, Sports Medicine and Women's Health (WH). Due to the campus closure as a result of COVID-19, the AUDIT-C screening was only implemented in the WH department. Female students who presented to the WH for an annual exam during the implementation period were invited to complete the AUDIT-C screening on the kiosk as part of the check-in process. Since the WH department was the only area to implement the screening process, outcome goals were measured using this patient population.

Ethical Considerations

The Collaborative Institutional Training Initiative (CITI) Program training was completed (Appendix E) which provided an overview of the requirements for ethical human subject research. The Institutional Review Board (IRB) at Liberty University granted approval

for this Evidence-Based Practice (EBP) project (Appendix F). Because this is an EBP project, the project site does not require an application be made to their IRB. This project did not require consent for participation from the staff or patients as implementation of this screening falls within the current scope of care currently being offered at SHS and does not specifically identify any staff or patients.

Data Collection

Point and Click (PnC) is the Electronic Health Record (EHR) used at SHS. The project team leader recreated the AUDIT-C as a survey within the EHR which launched when patients checked-in for an annual exam in the WH department. Template prompts were created to remind the provider to look at the survey score and also provided clinical decision support for management of scores.

HER-generated reports were used to determine the number of students seen, the number of students invited to take the AUDIT-C screening, and the number of students who completed the screening. An EHR report was also used to retrieve scores for each student who completed the AUDIT-C. SHS staff was asked to perform chart audits to obtain data about education materials provided to the patient and referral status. A data recording tool was created by the project team leader and provided to the Quality Improvement Nurse Coordinator. Any data provided to the project leader for analysis were deidentified and included only the system-generated patient number, raw AUDIT-C score, referral status and whether a follow-up letter with additional educational information was sent to the patient via the patient portal.

Tools

The alcohol screening tool for this project was the AUDIT-C questionnaire (Appendix G). The AUDIT-C is a three-question instrument that identifies behaviors that are consistent

with hazardous drinking and/or alcohol abuse/dependence (National Institute on Drug Abuse and Addiction, n.d.). Request for permission to use the AUDIT-C was not required because the instrument is available in the public domain (National Institute on Drug Abuse and Addiction, n.d.).

Eleven studies reviewed in the literature evaluated the validity of the AUDIT-C's use among college students. The evidence supported use of the AUDIT-C to identify hazardous or at-risk drinking in this patient population. The AUDIT-C was found to be a brief, useful tool to use for assessing frequent, heavy drinking for university student health centers (Blank, Connor, Gray & Tustin, 2014).

AUDIT-C scores range from 0-12 with higher scores indicating an increased risk for AUD. Studies by Blank et al. (2015), and Campbell and Maisto, (2018) established cut-off scores to identify at-risk drinking behaviors based on gender. A score of 5 for women and a score of 7 for men are considered high- risk for this patient population. Campbell & Maisto (2018) further purported that high-risk cut-off scores recommended for the population at large is 3 for women and 4 for men. A combination of these recommendations was used to establish cut-off scores and risk categories for this project. Based on these guidelines, Table 1 below shows the cut-off scores and risk categories that were developed:

An additional tool to facilitate successful integration of the alcohol screening was the use of templates in the EHR. The project leader developed and embedded template prompts on the WH Annual Exam template to remind providers to evaluate the AUDIT-C score and assist with clinical decision support.

Table 1

AUDIT-C Cut-off Scores and Risk Categories

Category	Female Screening Score	Male Screening Score
Low Risk	0-2	0-3
At Risk	3-4	4-6
High Risk	5 or greater	7 or greater

Table 1

Intervention

SBIRT is an evidenced-based method used to facilitate identification and timely referral and treatment for at-risk alcohol use among college students (Farmer et al., 2019). As previously stated, the AUDIT-C alcohol screening tool was chosen as the tool that would be used to assess risky drinking behaviors of students who presented to the health center during the Spring 2020 semester. Students were assigned a risk category based upon their screening score and additional follow-up was recommended accordingly.

A training session was held for all Medical Services providers during which the project leader provided an overview of the project and outcome goals. The training consisted of directions on the use of SBIRT, interpreting AUDIT-C scores, and motivational interviewing techniques with key talking points to facilitate referral to treatment. The Director of Strategic Health Initiatives facilitated the training session and served as a content expert for student feedback letters. Three feedback letters were developed to correspond with each of the three risk categories; low-risk, at-risk or high-risk (Appendix H). Medical Services providers were advised that additional training sessions would be held in each area to review templates, prompts and educational materials.

An additional training session was held just prior to go-live for the WH providers. Workflow (Appendix I) for the screening process and feedback letters were reviewed with the staff. The WH department chose a subset of patients who presented to their department to pilot the AUDIT-C implementation - patients presenting for an annual exam. The practice change was implemented on February 10th, 2010 and concluded on March 13th, 2010. Upon check in for an annual exam, patients were invited to complete the AUDIT-C. Providers reviewed the patients score during the examination and provided feedback to each student based on the risk category indicated by their score. Each patient screened should have received a letter through the patient portal with additional feedback about their risk category and, for those who scored in the high-risk category, a referral to Substance Abuse and Prevention Education (SAPE) recommended.

Data Analysis

PnC reports were used to determine the number of patients scheduled for an annual exam in the WH department during the implementation period as well as how many of these patients were invited to take the AUDIT- C. This information was used to determine the percentage of patients who completed the AUDIT-C. An additional report was generated in PnC to determine the number of referrals over the previous academic year. Because a specific referral type was created to track referrals to SAPE for this project, a referral report using keywords searches for related text (substance use, alcohol misuse) was used to try to determine the number of referrals for risky alcohol behaviors.

A chart review was then conducted to verify of the number of patients who completed the AUDIT-C, and how many of them received follow-up education through the patient portal. This data was used to calculate the percentage of students who received follow-up education. The

chart review was also used to determine if a referral to SAPE was initiated for patients scoring the high-risk category and this information was used to determine the number of high-risk patients who received a referral.

SECTION FOUR: RESULTS

Measurable Outcome 1

Goal 1 of this project was for at least 50% of students seen at the health center in a Medical Services department during the Spring 2020 semester to complete an AUDIT-C screening. This goal was not met due to the campus closure because of the COVID-19 pandemic. However, the initial phase of the implementation plan was fulfilled by administering the AUDIT-C screening tool to patients who presented to WH for an annual exam. There were 196 annual exams scheduled during the implementation period. Of the 196 scheduled annual exams, 183 students (93.3%) were invited to take the AUDIT-C and 172 of the invitees (93.4%) completed the screening. Based upon implementation in this department, this goal was achieved (See Tables 2 and 3).

Table 2

Percent of Students Who Were Invited to Complete an AUDIT-C Screening

Number of Annual Exams	Number of AUDIT-C Invitees	Percent Invited
196	183	93.3%

Table 2

Table 3

Percent of Invitees Who Completed an AUDIT-C Screening

Number of AUDIT-C Invitees	Number of Completions	Percent Completed
183	172	93.4%

Table 3

A PnC report of raw AUDIT-C scores revealed respondents fell in the range of 1-8. Of the 172 patients who completed the AUDIT-C, 90 scored in the low-risk category, 53 in the at-risk category and 29 in the high-risk category (See Figures 1 and 2)

Figure 1. Frequency Histogram for AUDIT-C Scores

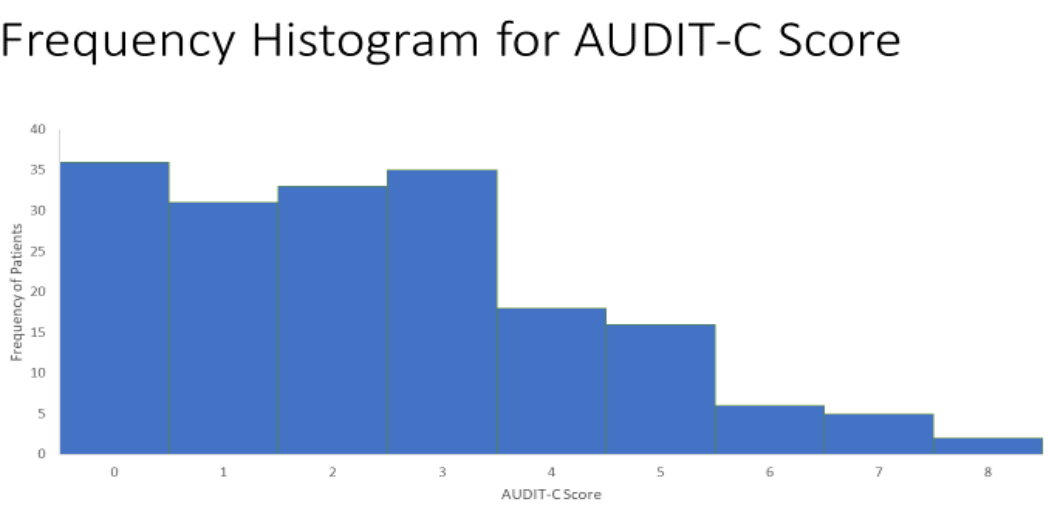
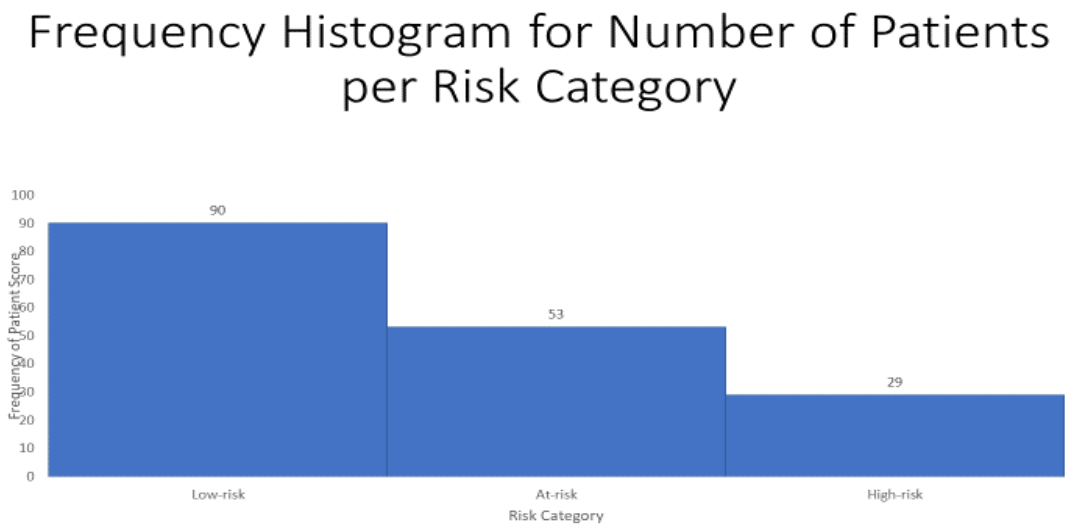


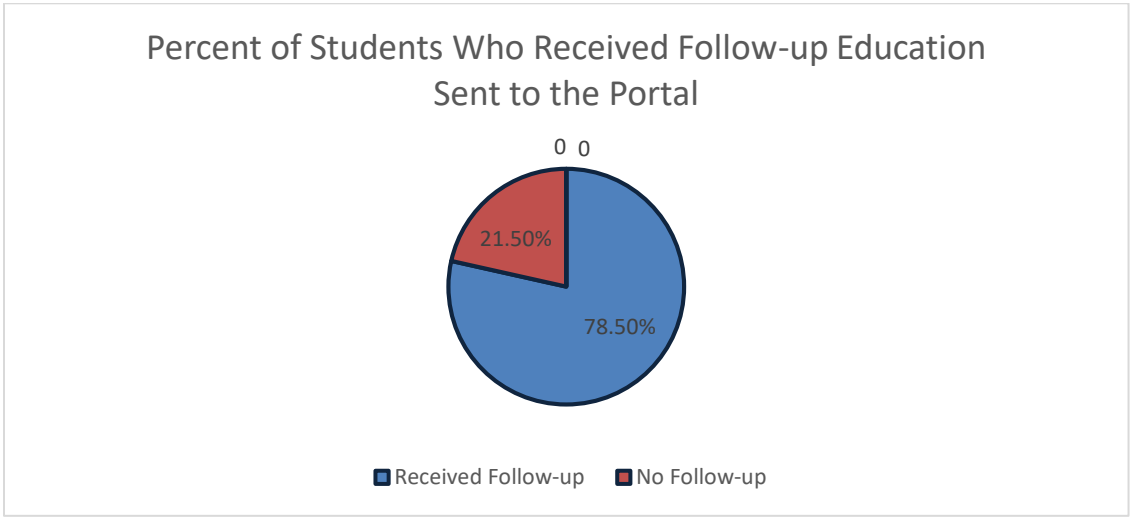
Figure 2. Frequency Histogram of Number for Patients Per Risk Category

Measurable Outcome 2



Goal 2 of this project was that 100% of students who were screened with AUDIT-C will receive a follow-up letter providing additional educational information about their score. Of the 172 patients who completed the AUDIT-C, 135 or 78.5% received a feedback letter via the patient portal (See Figure 3).

Figure 3. Percent of Students Who Received Follow-up Education Sent to the Portal

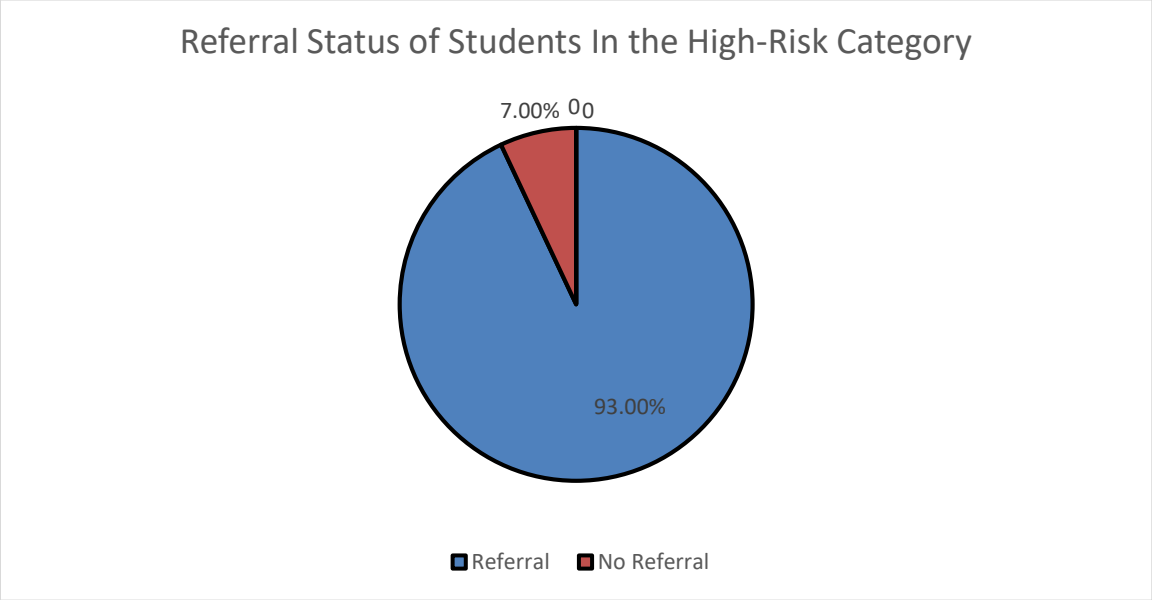


For 27 of the 29 patients who scored in the high-risk category, a referral to SAPE was initiated. This measurement fell short of the 100% goal. However, it is noteworthy to mention that 27 of the 37 students who did not receive additional information via the patient portal fell into the low-risk category; there was an initial miscommunication that patients who scored in the low-risk category did not receive follow-up education. Another challenge with achieving this goal was the Virtual Machines used in the exam rooms had been recently updated and providers discovered during the first week that they were unable to use them to send information through the portal. This issue was resolved by the end of the first week.

Measurable Outcome 3

Goal 3 of this project was that 100% of students who have a positive screening on AUDIT-C indicative of a high-risk were referred to SAPE for treatment and follow-up. Of the 172 patients who completed the AUDIT-C screening, 29 patients scored in the high-risk category and should have received a referral to SAPE. As shown in Figure 4, of the 29 patients, 27 or 93% of these patients received a referral to SAPE. While this goal fell short of reaching the target of 100%, significant strides were made to ensure students scoring in the high-risk category received a referral for treatment. Of the two students who did not receive a referral, a chart review revealed that the provider noted that the screening was not administered during the visit and for the other patient, the screening was acknowledged and the template prompts completed so it is likely that even if a referral was not initiated, the provider was able to address the student's drinking behaviors.

Figure 4. Referral Status of Students In the High-Risk Category



Measurable Outcome 4

Goal 4 of this project was that there would be at least a 10% increase in the number of referrals to SAPE as a result of implementing SBIRT to more readily identify risky drinking behaviors. The project leader reviewed referral reports for the previous academic year in an effort to determine the number of referrals for risky alcohol behavior. This was a challenge because although SAPE services were available prior to this project, the SAPE referral type was built specifically for this project. The project leader had to generate referral report by using keyword searches related to alcohol use. This search yielded no results. It is of note, that WH providers provide general education to patients each year about alcohol use during their annual exam but, without a systematic screening process to determine high-risk drinking behaviors, it is likely that no referrals for treatment were initiated. Implementation of SBIRT to determine risky alcohol behaviors was successful with 29 referrals for follow-up.

Implications for Practice

Risky drinking behaviors often result in negative consequences for college age students. University student health centers are presented with a unique opportunity to address unhealthy drinking habits for students who present for care as they are often seen as a trusted resource for information and care. Universities where health centers lack a systematic process of identification and support for treatment have a higher possibility of risky drinking behaviors going undetected. This project is evidence that SBIRT provides a structured framework to screen students using a validated tool, to assist with identification of students with at-risk drinking behaviors and facilitate a referral to treatment.

Implementation of the AUDIT-C screening with pre-determined risk-categories based on the patient's score provided the WH providers a systematic, non-judgmental way to address drinking behavior. Template prompts with embedded clinical decision support and pre-written letters with education specific to the patient's risk category, served as reminders to talk with the patient about the score and allowed providers to seamlessly forward the patient additional information during the visit.

Limitations

The scope of this project was to assess risky drinking behaviors for students who presented to the Medical Services areas (Women's Health, Primary Care, and Sports Medicine) at SHS. Due to the COVID-19 pandemic, phases II and III of this project - implementation of the alcohol screening in Primary Care and Sports Medicine - was not completed. It is uncertain if the practice change would have been as successful in those areas.

Another limitation of this project was it did not address the impact SBIRT had on changing unhealthy drinking behaviors. It will be important as this project continues at SHS to

implement practices that will help to determine if the SBIRT is successful at reducing risky drinking behaviors. This can be achieved by obtaining follow-up AUDIT-C scores and/or survey students about the impact the intervention had on making them aware of their drinking behaviors and changes that resulted from knowing their risk category.

Sustainability

SHS is committed to promoting the health and well-being of their patient population through the implementation of screening tools that address their physical and mental well-being. While this project was only implemented in one of the Medical Services departments, findings from the WH's implementation support the practicality of administering an alcohol screening to students and providing feedback during their visit.

Of consideration as the organization seeks to expand the screening process, is that WH's annual exam visits are allotted 40 minutes as a routine wellness visit and the length of the visit allows for time to discuss preventative care. These types of preventative appointments make up the bulk of patients seen in the WH department. For the other two departments in Medical Services, patients most often frequent them for acute episodic care. Those visits are allotted 20 minutes and may often be complicated with caring for urgent care needs. Whereas WH may see 172 patients for wellness and preventative care in a month, Primary Care and Sports Medicine may not see that many wellness visits in an academic year. If the AUDIT-C was administered only to students who present for a wellness visit in these areas, it would greatly limit the possible number of students screened and result in missed opportunities to address unhealthy drinking behaviors.

Primary Care and Sports Medicine have expressed concern with having enough time to address screening results during a 20-minute visit. Since the workflow for this practice change

has not been evaluated during a 20-minute visit, the project leader recommends a phased approached to implementation in these areas by having students who present for a wellness exam (40 minutes) or follow-up visit (20 minutes) in these areas complete the AUDIT-C screening. This will allow the providers to become acclimated and comfortable with the practice change before implementing it for all visit types.

Identifying a champion provider from WH may also be helpful as this practice change is implemented in the other Medical Services department. The medical director for Women's Health served as a member of the IDT and has experienced the practice change first-hand. He may be able to provide tips for maximizing workflow and effective motivational interviewing techniques.

Dissemination Plan

Dissemination of the results of evidence-based projects is critical to influencing practice changes that promote optimal patient outcomes. Initial results of this practice change will be communicated with IDT and the WH department. The results will then be shared with SHS' Quality Improvement Committee and across the organization via the organization's newsletter, the *Quality Quarterly*.

In recent years, SHS has chosen to highlight evidence-based quality improvement projects via poster presentation for their AAAHC reaccreditation surveys. The results of this project will be adapted to poster format and for display during the on-site survey due fall 2020. These findings may also be shared with other universities looking for benchmarking data and best practices for addressing alcohol use among college students seen at their health centers.

Conclusion

Physical and mental health outcomes as well as academic success are greatly impacted by the unhealthy drinking behaviors of college students. University health centers can be instrumental in identifying students at risk for these negative outcomes and provide educational resources and additional support as appropriate. SBIRT is an evidence-based approach to addressing risky drinking behaviors and when used with a validated screening tool like the AUDIT-C, template embedded clinical decision support to assist with determining risk category, and access to community referral resources, providers have all of the tools needed to be successful with identifying students most at risk and getting them the support they may need.

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Appendices

Appendix A—Levels of Evidence Table

Article Title, Author, etc. (Current APA Format)	**Study Purpose**	**Sample (Characteristics of the Sample: Demographics, etc.)**	**Methods**	**Study Results**	**Level of Evidence (Use Melnyk Framework)**	**Study Limitations**	**Would Use as Evidence to Support a Change? (Yes or No) Provide Rationale.**
Ahmed, R., Hustad, J. T. P., LaSalle, L., & Borsari, B. (2014).	To determine if pregaming among college students is a risk factor for hospitalization	n=516 undergraduate students at a large university in mid-Atlantic United States who received medical treatment related to alcohol use	Correlational study	Survey results revealed that students with higher scores on the AUDIT-C, female students, older students and light drinkers were at higher risk of needing medical attention	Level 4	Conducted at one university. Cross-sectional, sample population of students who received medical treatment related to alcohol use, therefore results may not be typical of the student body as a whole. Self-reported data, potential for bias.	Yes, validates use of the AUDIT-C to identify harmful and hazardous drinking behaviors.
Bachhuber, M., Bradley, K., Bachhuber, M. A., & Bradley, K. A. (2016).	Evaluation of the World Health Organization and the United States Preventative Task Force's recommendations	2013 National Survey of Drug Use and Health data	N/A	71% of patients report being asked about alcohol use and among those identified as having unhealthy	Level 7	Self-report survey data, individuals may over or underreport. Unknown if questions	Yes, reinforces use of CDS in the EHR and the need to ensure providers receive education and training

Article Title, Author, etc. (Current APA Format)	Study Purpose	Sample (Characteristics of the Sample: Demographics, etc.)	Methods	Study Results	Level of Evidence (Use Melnyk Framework)	Study Limitations	Would Use as Evidence to Support a Change? (Yes or No) Provide Rationale.
	regarding screening and brief intervention for alcohol in the primary care setting			drinking habits only 20% reported they were advised to cut back, even fewer were offered education or treatment. Consistent delivery of a brief intervention can be facilitated by embedding clinical decision support (CDS) in the EHR and providing motivational interviewing training for providers.		regarding alcohol were related to the presenting chief complaint.	regarding brief intervention.
Blank, M., Connor, J., Gray, A., & Tustin, K. (2015).	To describe baseline distribution of alcohol consumption, compare alcohol screening tools	5082 randomly selected final- year students aged up to 25 years from eight	Descriptive Study	AUDIT-C was found to be a useful brief screening tool to assess heavy episodic	Level 6	Lack of alternative measurement tool for hazardous drinking to use	Yes, provides recommended cut-off points for use of the AUDIT-C with college students.

Article Title, Author, etc. (Current APA Format)	Study Purpose	Sample (Characteristics of the Sample: Demographics, etc.)	Methods	Study Results	Level of Evidence (Use Melnyk Framework)	Study Limitations	Would Use as Evidence to Support a Change? (Yes or No) Provide Rationale.
	(AUDIT-2, AUDIT-3 and AUDIT-C), and use of individual items and sociodemographic variables to describe patterns of hazardous drinking.	universities in New Zealand		drinking and frequency in this patient population. AUDIT -2 is a great tool to determine if a more in-depth assessment is needed. AUDIT-3 is a slightly better measurement tool for students who report drinking at a hazardous level. Recommendatio n s for sex specific cut-off points based on baseline data. Drinking patterns were associated with age, degree, relationship status, accommodation		compare to components of the AUDIT-C. Data was collected anonymously as a subset of a larger survey thus it should be determined if results would be similar using a different collection method.	

Article Title, Author, etc. (Current APA Format)	Study Purpose	Sample (Characteristics of the Sample: Demographics, etc.)	Methods	Study Results	Level of Evidence (Use Melnyk Framework)	Study Limitations	Would Use as Evidence to Support a Change? (Yes or No) Provide Rationale.
				type and employment.			
Campbell, C. E., & Maisto, S. A. (2018).	To examine the construct validity of using the AUDIT-C to identify at-risk drinking at a university primary care and determine cut-off scores for at-risk consumption and negative drinking consequences	387 randomly selected students at a private university in northeastern United States	Descriptive Study	Brief Young Alcohol Consequence Questionnaire, Quick Drinking Screen, and AUDIT-C scores were compared using an independent sample t-test. There was significant correlation of consumption variables validating the construct validity of the AUDIT-C.	Level 6	May not be generalizable to university primary care settings as participants were recruited through email and completed the survey online. Drinking behaviors of students who participated versus those who didn't are unknown. Time frame referenced on each survey varied which may impact results. Potential for underestimating	Yes, the use of the AUDIT-C in a college health center is validated as well as different cut-off scores for at-risk drinking based on gender.

Article Title, Author, etc. (Current APA Format)	Study Purpose	Sample (Characteristics of the Sample: Demographics, etc.)	Methods	Study Results	Level of Evidence (Use Melnyk Framework)	Study Limitations	Would Use as Evidence to Support a Change? (Yes or No) Provide Rationale.
						or under-reporting drinking behaviors. Potential that construct validity is overstated because of screening delivery as online data collection may be more likely to produce a positive screening.	
Christoff, A. de O., & Boerngen-Lacerda, R. (2015).	To compare the efficacy of three interventions (computerized screening and motivational intervention, non-computerized screening and motivational intervention and	An initial convenience sample of 815 invited to screen, those with at risk scores were than randomized as follows: ASSIST/MCIc=128 ASSIST/MBIi=106	Randomized-control trial	Participants with at-risk scores for alcohol use and assigned to the intervention groups had lower scores when their baseline scores were compared to scores at their 3-	Level 2	There was no additional follow-up after three months. Results may not be generalizable because this was a mostly female sample.	Yes, supports that brief intervention can have a positive impact on reducing at-risk drinking behaviors.

Article Title, Author, etc. (Current APA Format)	Study Purpose	Sample (Characteristics of the Sample: Demographics, etc.)	Methods	Study Results	Level of Evidence (Use Melnyk Framework)	Study Limitations	Would Use as Evidence to Support a Change? (Yes or No) Provide Rationale.
	screening only) on substance use behaviors.	Control=105		month follow-up.			
Cortés Tomás, M. T., Giménez Costa, J. A., Motos-Sellés, P., Sancerni Beitia, M. D., & Cadaveira Mahía, F. (2017).	Evaluates the usefulness of the AUDIT, AUDIT-C and AUDIT-3 and data from participants' daily diary in detecting binge drinking and establishing cut-off points for each gender	862 college students in Madrid and Valencia age 18-22 years	Descriptive study	AUDIT-C was a better indicator of binge drinking regarding both specificity and sensitivity. Data suggest when using the AUDIT-C, 3 is an appropriate cut-off point for both males and females.	Level 6	Self-reported data, potential for bias. May not be generalizable to young people of all ages.	Yes, confirms use of the AUDIT-C as a valid screening tool.
Davoren, M. P., Demant, J., Shiely, F., & Perry, I. J. (2016).	To summarize the prevalence of alcohol use among college students in the United Kingdom and the Republic of Ireland.	29 peer-reviewed articles	Literature review	High levels of alcohol consumption and risky drinking behavior is prevalent on college campuses in the Republic of Ireland and the	Level 5	All studies were performed in the United Kingdom and the Republic of Ireland and may not be generalizable.	Seven studies in this literature review used the AUDIT-C as the screening tool. Results also reinforce hazard drinking as a serious public health concern.

Article Title, Author, etc. (Current APA Format)	Study Purpose	Sample (Characteristics of the Sample: Demographics, etc.)	Methods	Study Results	Level of Evidence (Use Melnyk Framework)	Study Limitations	Would Use as Evidence to Support a Change? (Yes or No) Provide Rationale.
				United Kingdom.			
Farmer, A. Y., Powell, K. G., Treitler, P. C., Peterson, N. A., & Borys, S. (2019)	To determine the facilitators and barriers to implementation of SBIRT at a student health center, how the health center adapted to improve the program and what successes they had along the way.	25 participants (administrators, clinical staff, medical assistants. Two focus groups with 5-6 participants in each 14 individual interviews 2944 students average age 20	Case-control Study	Results revealed workflow challenges and mixed-levels of buy-in during year one of the implementation which required additional training and support for the staff. Community norms about alcohol consumption on a college campus was identified as a challenge and was addressed with personalized normative	Level 4	Evaluates implementation of SBIRT at one site. Causality of improved screening rate cannot be validated based on one study. Students/Patients were not interviewed for their feedback about the implementation.	Yes, validates use of the AUDIT-C as a screening tool at a university student health center.

Article Title, Author, etc. (Current APA Format)	Study Purpose	Sample (Characteristics of the Sample: Demographics, etc.)	Methods	Study Results	Level of Evidence (Use Melnyk Framework)	Study Limitations	Would Use as Evidence to Support a Change? (Yes or No) Provide Rationale.
				feedback to ensure students were educated regarding how much drinking occurs among their peers which is far less than they perceive. Another challenge identified was the ability to follow-up with students who screened positive on the brief screen and this was addressed by administering the full screen over the phone or scheduling a face-to-face follow-up appointment. Screening results improved after changes were			

Article Title, Author, etc. (Current APA Format)	Study Purpose	Sample (Characteristics of the Sample: Demographics, etc.)	Methods	Study Results	Level of Evidence (Use Melnyk Framework)	Study Limitations	Would Use as Evidence to Support a Change? (Yes or No) Provide Rationale.
				made to improve the workflow processes.			
Ganz, T., Braun, M., Laging, M., Schermelleh-Engel, K., Michalak, J., & Heidenreich, T. (2018).	Evaluate the effectiveness of an electronic, web-based screening and brief intervention (e-SBI) for students of legal drinking age identified as high-risk	German university students of legal drinking age with positive Control group received an assessment only (AO) and the intervention group was provided an eSBI. Follow-up assessment were given at 3 and 6 months following the collection of baseline date Baseline AO n=467 eSBI n=514 3-month follow-up AO n=231	Randomized-control trial	Improvement in drinking habits was noted in the eSBI group	Level 2	Participation was voluntary so readiness to quit was not assessed and so sample could contain selection bias. High attrition rate in both arms of the study but the AO only group had a higher retention rate. S	Yes, evidence supports use of SBI to reduce drinking and the AUDIT-C as an appropriate assessment tool.

Article Title, Author, etc. (Current APA Format)	Study Purpose	Sample (Characteristics of the Sample: Demographics, etc.)	Methods	Study Results	Level of Evidence (Use Melnyk Framework)	Study Limitations	Would Use as Evidence to Support a Change? (Yes or No) Provide Rationale.
		eSBI n=194 Six-month follow-up AO n=200 eSBI n=146					
Glass, J. E., Hamilton, A. M., Powell, B. J., Perron, B. E., Brown, R. T., & Ilgen, M. A. (2015).	To determine if screening, brief intervention and referral for self-reported alcohol consumption results in increased utilization of alcohol related care.	12 Random Controlled Trials n=933intervention group N=937 control group	Meta-Analysis	No evidence that brief alcohol intervention was effective increasing alcohol related care overall but participants with higher alcohol severity scores tended to have higher rates of utilization rates.	Level 1	Not all the RCTs included in the study assessed treatment utilization. Because of significant heterogeneity across studies, results may not be generalizable.	Yes, although a brief intervention was not shown to statistically significant with overall utilization of referral services; there was higher utilization among those whose scores indicated a higher alcohol severity. This project seeks to target those with high-severity so the brief intervention could impact use of alcohol-related care.
Hagman, B. T. (2016).	To evaluate the effectiveness of the AUDIT's	251 students at a large public university in	Descriptive Study	Results indicated that the AUDIT is at the lower	Level 6	Self-reported data, potential for bias. DSM-	While the AUDIT not AUDIT-C was the screening tool,

Article Title, Author, etc. (Current APA Format)	Study Purpose	Sample (Characteristics of the Sample: Demographics, etc.)	Methods	Study Results	Level of Evidence (Use Melnyk Framework)	Study Limitations	Would Use as Evidence to Support a Change? (Yes or No) Provide Rationale.
	identification of college students who meet the criteria for DSM-5 AUD, determine the cut-off scores for sensitivity and specificity as well as if thresholds vary based on gender.	southeastern United States		end of moderate in diagnosing AUD with DSM-5 when compared to the DSM-IV. Overall cut score of greater than or equal to eight was identified for detection of AUD and findings support gender specific scores.		5 AUD diagnosis was not made through formal diagnostic interview. Cut-off scores may not be generalizable to college students in different contexts as environmental factor should be considered when establishing cut-off scores.	this study supports the need of conducting alcohol screening among this population.
Harris, S. K., & Knight, J. R. (2014).	To evaluate the feasibility of using computer or other technology-based alcohol screening tools in medical settings.	Three patient populations identified: Adults 18 and over Pregnant women Adolescents 17 years and younger	Systematic Review of 12 studies of varying design	Results suggest that using technology for SBIs in the medical setting is acceptable and feasible.	Level 5	Not all the studies included in the literature review measured alcohol-related outcomes which can be a key indicator of	Yes, provides support for use of a computer-technology based alcohol screening which will be used for this project.

Article Title, Author, etc. (Current APA Format)	Study Purpose	Sample (Characteristics of the Sample: Demographics, etc.)	Methods	Study Results	Level of Evidence (Use Melnyk Framework)	Study Limitations	Would Use as Evidence to Support a Change? (Yes or No) Provide Rationale.
						effectiveness of the screening process and identify key intervention benefits.	
Jones, K. A., Chryssanthakis, A., & Groom, M. J. (2014).	To measure the inter-relationships between alcohol consumption, impulsivity, motives for drinking and engagement in alcohol related problems.	400 university students aged 18-25 in the United Kingdom asked to complete an anonymous survey	Correlational Study	Screening for severe drinking consequences can be a useful indicator of alcohol-related problems in the UK. There is a direct link between impulsivity and alcohol consumption as well as risky behaviors. Results indicate alcohol is used as coping mechanism and binge drinking is common among this age group.	Level 4	Performed in the UK may not be generalizable to other populations. Self-reported data. Underreporting of alcohol consumption could skew the results.	Yes, understanding motives and factors that influence drinking behaviors will help with SBI protocols.

Article Title, Author, etc. (Current APA Format)	Study Purpose	Sample (Characteristics of the Sample: Demographics, etc.)	Methods	Study Results	Level of Evidence (Use Melnyk Framework)	Study Limitations	Would Use as Evidence to Support a Change? (Yes or No) Provide Rationale.
				Additionally, risk taking and increased alcohol consumption are associated with sensation seeking.			
Kypri, K., Vater, T., Bowe, S. J., Saunders, J. B., Cunningham, J. A., Horton, N. J., & McCambridge, J. (2014).	To determine the effectiveness of screening and brief intervention using web-based modalities.	3429 university students in New Zealand who screened positive for hazardous or harmful drinking using a web-based version of the AUDIT-C and delivery of an intervention that provided feedback once the screening was complete n=1716 control group N=1706 intervention group	Randomized-control trial	Intervention group that received feedback about drinking behaviors had a reduction a small reduction in amount of alcohol consumed at one time based on AUDIT-C scores but did not significantly impact overall consumption. Indicates screening and brief intervention alone is not	Level 2	Self-reported dated can be misreported. Conservative approach to statistical analysis was taken because of the measurement of 6 co-primary outcomes.	Yes, reinforces use of the AUDIT-C as screening tool using a technology-based platform. Underscores the importance of using a practical preventative approach to providing feedback.

Article Title, Author, etc. (Current APA Format)	Study Purpose	Sample (Characteristics of the Sample: Demographics, etc.)	Methods	Study Results	Level of Evidence (Use Melnyk Framework)	Study Limitations	Would Use as Evidence to Support a Change? (Yes or No) Provide Rationale.
				enough to address alcohol-related unhealthy behaviors. More pragmatic trials should be conducted to assist with determining the effectiveness of SBI.			
Martin, R. J., Chaney, B. H., & Cremeens, M. J.	Use of field studies to evaluate the association between breath alcohol concentration (BrAC) levels, AUDIT-C classification and plans for getting home after drinking at a bar.	Convenience sample of 713 college students in Greenville NC chosen anonymously from local bars	Descriptive study	Students with low AUDIT-C scores had lower BrAC levels that those whose score indicated a problem. 95% of the sample size was not planning to drive home.	Level 6	Data was collected over four nights and cannot be generalized to drinking behaviors on other nights. Small sample population in NC, results specific to location and may not be generalizable to students at other	Yes, AUDIT-C results correlated with BrAC, inversely as well as risky behavior (driving while impaired). Great indicator that the AUDIT-C is a predictor of harmful and hazardous drinking.

Article Title, Author, etc. (Current APA Format)	Study Purpose	Sample (Characteristics of the Sample: Demographics, etc.)	Methods	Study Results	Level of Evidence (Use Melnyk Framework)	Study Limitations	Would Use as Evidence to Support a Change? (Yes or No) Provide Rationale.
						universities in other states.	
McCabe, B. E., Stark, G., Halstead, V., Munoz-Rojas, D., Gelberg, L., Pantin, H., & Prado, G. (2019)	To report screener completion and detection of risky alcohol usage behavior rates by comparing two alcohol screening tools (AUDIT and 5/4 questionnaire) as well as two methods of administration (tablet or kiosk)	A convenience sample of 259 University of Miami students seen at the student health center. Cluster randomization used to assign participants into one of two groups depending on the day they visited the clinic	Quasi-experimental Study	No statistical significance in the rate of completion based on the screening tool. More students were identified as having risky drinking behaviors when administered the 5/4 questionnaire versus the AUDIT despite the method of administration	Level 3	Non-random sample selection, results may not be generalizable. Environmental factors may have influenced results. Single item questionnaires like the 5/4 have higher false-positive rates.	Yes, provides recommendations for student health centers for implementation of an alcohol screening.
McNeely, J., Haley, S. J., Smith, A. J., Leonard, N. R., Cleland, C. M., Ferdschneider,	To assess acceptability and feasibility of using substance use screening tools (SUBS and ASSIST) to	502 students seen at two study sites in New York City One study site was a private university in Manhattan the	Descriptive Study	67.1% of all participants reported unhealthy alcohol use, percentages	Level 6	Study conducted at two schools in New York, results may not be	Yes, although the AUDIT-C was not used as the screening tool, results indicate feasibility of administering the

Article Title, Author, etc. (Current APA Format)	Study Purpose	Sample (Characteristics of the Sample: Demographics, etc.)	Methods	Study Results	Level of Evidence (Use Melnyk Framework)	Study Limitations	Would Use as Evidence to Support a Change? (Yes or No) Provide Rationale.
M., … Adam, A. (2019)	measure prevalence and severity of alcohol and drug use among patients at a university student health center	other site was a public university in Brooklyn		varied among other substances assessed. Prevalence of lifetime alcohol and tobacco use did not vary significantly by site but drug use did. Overall screening was acceptable by students, 93% of students offered the screening completed it but less than half of students completing the screening chose to share results with their primary care provider.		generalizable. Screenings were confined to a short time period. Study design offers no comparison of anonymous versus provider informed screening methods	survey at a university health center and acceptability of students to use it.
Meier, E., Miller, M. B., Lombardi, N., &	To examine how alcohol assessment affects drinking	N=290 undergraduate students at a southern plains'	Randomized-control trial	All groups reported a decrease in peak drinks except the	Level 2	Control group completed quantity and frequency of	Yes, supports screening of college student's alcohol use and asserts that

Article Title, Author, etc. (Current APA Format)	Study Purpose	Sample (Characteristics of the Sample: Demographics, etc.)	Methods	Study Results	Level of Evidence (Use Melnyk Framework)	Study Limitations	Would Use as Evidence to Support a Change? (Yes or No) Provide Rationale.
Leffingwell, T. (2017).	behaviors using five questionnaires	university reporting at least one binge drinking episode in the last month. Randomized group assignments as follows" Control group, consequence group, normative perceptions group, diagnostic assessment group (used AUDIT) and combined group (all questions)		consequence group. Participants reduced risky drinking behaviors but not the amount of alcohol consumed.		alcohol use, not a no-assessment control group. Survey error did not allow researchers to control for gender; there are gender differences in alcohol consumption. Students were asked to account for the last seven days of drinking which may not have reflected typical drinking behaviors.	assessment alone could be an intervention in student health settings.
Miller, L. B., Brennan-Cook, J., Turner, B., Husband-Ardoin, M., & Hayes, C. S. (2018).	To implement the AUDIT-C at a southern university health clinic	60 students seen at student health services over a month's time frame	Descriptive Study	Implementation of the AUDIT-C resulted in a statistically significant increase in the	Level 6	Implemented at one clinic. Convenience sample used; may not be generalizable.	Yes, supports use of the AUDIT-C as a screening tool to identify AUD and improved outcomes for students who

Article Title, Author, etc. (Current APA Format)	Study Purpose	Sample (Characteristics of the Sample: Demographics, etc.)	Methods	Study Results	Level of Evidence (Use Melnyk Framework)	Study Limitations	Would Use as Evidence to Support a Change? (Yes or No) Provide Rationale.
				number of students identified as misusing alcohol. More males screened higher than females. Of students identified as high risk, 56% returned for follow-up. Post surveys revealed that interventions improved student outcomes.		Self-reported data, potential for bias.	receive an intervention.
Miller, M. B., Van Reen, E., Barker, D. H., Roane, B. M., Borsari, B., McGeary, J. E., … Carskadon, M. A. (2017).	To examine the correlation Between sleep and psychiatric symptoms with heavy drinking and alcohol-related consequences	385 students at a private university in the Northeastern United States, identified as heavy drinkers	Correlational Study	Results indicate a positive association between sleep quality, psychiatric symptoms and number of drinks per day and	Level 4	Causality of symptoms cannot be determined because outcomes were measured concurrently. Sample was	Yes, supports the impact alcohol use has on sleep quality which is known to also impact student outcomes. Also, many students may present with psychiatric issues

Article Title, Author, etc. (Current APA Format)	Study Purpose	Sample (Characteristics of the Sample: Demographics, etc.)	Methods	Study Results	Level of Evidence (Use Melnyk Framework)	Study Limitations	Would Use as Evidence to Support a Change? (Yes or No) Provide Rationale.
				alcohol-related consequences.		primarily white, first semester students at a single university, results may not be generalizable. Data was self-reported, there is potential for over or underreporting. Participants were not screened for other diagnoses that can affect sleep and the bidirectional relationship between alcohol use and the impact it can have on sleep was not evaluated.	that may be triggered by underlying alcohol use, this is good background information.

Article Title, Author, etc. (Current APA Format)	**Study Purpose**	**Sample (Characteristics of the Sample: Demographics, etc.)**	**Methods**	**Study Results**	**Level of Evidence (Use Melnyk Framework)**	**Study Limitations**	**Would Use as Evidence to Support a Change? (Yes or No) Provide Rationale.**
Nunes, A. P., Richmond, M. K., Marzano, K., Swenson, C. J., & Lockhart, J. (2017).	To evaluate the effectiveness of a statewide screening, brief intervention and referral to treatment (SBIRT) initiative in Colorado 10 years post-implementation	175,000 patients screened in grant-funded sites as well as health care staff at these sites.	Case Control Study	Successful implementation of SBIRT requires an interdisciplinary team approach, ensuring buy-in across the organization. Protocols should be incorporated into workflow and technology used when possible to facilitate screenings and reduce the burden of a paper process for the staff. Screening tools should be brief and it is imperative to have referral and treatment options readily available for	Level 4	Evaluates the use of SBIRT in the state of Colorado, may not be generalizable.	Yes, provides valuable information for designing a successful SBIRT implementation model to address alcohol use/abuse.

Article Title, Author, etc. (Current APA Format)	Study Purpose	Sample (Characteristics of the Sample: Demographics, etc.)	Methods	Study Results	Level of Evidence (Use Melnyk Framework)	Study Limitations	Would Use as Evidence to Support a Change? (Yes or No) Provide Rationale.
				patients who screen positive.			
Prince, M. A., Read, J. P., & Colder, C. R. (2019).	To identify patterns of drinking present during the college years that indicate an increased risk of developing AUD	525 freshmen at a mid-sized public university in the northeastern United States who provided data throughout their undergraduate years and an additional assessment following graduation	Cohort Study	Students later diagnosed with AUD disorder reported higher quantity levels for alcohol consumption, and higher percentages of heavy binge drinking and higher alcohol related consequences when compared to those students without AUD	Level 4	Sample size limited to students at a single university and may not be generalizable. There was lack of representation by ethnic minorities and there were more females than males in the study. Consideration of maturing out of college drinking behaviors was not evaluated for students who did not graduate. Data were self-	Yes, explores college drinking patterns that may be an indication of risk for developing AUD which provides insight on development of appropriate interventions

Article Title, Author, etc. (Current APA Format)	Study Purpose	Sample (Characteristics of the Sample: Demographics, etc.)	Methods	Study Results	Level of Evidence (Use Melnyk Framework)	Study Limitations	Would Use as Evidence to Support a Change? (Yes or No) Provide Rationale.
						reported, potential for bias.	
Shepardson, R., & Funderburk, J. (2014).	To evaluate the success of integrating mental and behavioral health screenings in a university primary care setting.	Students seen at Syracuse University Student Health Center in 2010 Spring n=2500 Fall n=1626	Descriptive study	Successful integration of screenings to assess sleep, depression, alcohol and tobacco-use as well as suicidal ideation.	Level 6	Conducted at a single university. Data was not collected or analyzed regarding how often patients declined to participate. Screenings tools were not always validated tools for the sake of keeping assessments brief.	Yes, supports use of screening tools to include an alcohol screening for students seen in a university clinic which is the setting for this project.
Wahesh, E., & Lewis, T. F. (2015).	To examine the psychosocial variables associated with hazarding drinking based on AUDIT-C criteria	College students age 18-24, both male and female n=572	Correlational study	More than half of participants had a positive score on the AUDIT-C. Data analysis revealed	Level 4	Convenience sampling which may not be generalizable. Self-reported data, which	Yes, provides foundation for implementation of an SBI program.

Article Title, Author, etc. (Current APA Format)	Study Purpose	Sample (Characteristics of the Sample: Demographics, etc.)	Methods	Study Results	Level of Evidence (Use Melnyk Framework)	Study Limitations	Would Use as Evidence to Support a Change? (Yes or No) Provide Rationale.
				that family history, gender, perceived norms, outcome expectations and drinking history impact drinking. SBI recommendation included tailoring interventions based on gender and including risk reduction strategies, normative reeducation and peer involvement .		required participants to recall past experiences based on memory which can be unreliable.	
Wilson, S. L., Cooper, R. L., Nugent, W. R., & Champion, D. (2016)	Identify strategies to treat high-alcohol assumption on college campuses.	Seven peer-reviewed journal articles	Systematic review	Individual interventions like BASICS (evidence-based program to reduce risks and improve decision-	Level 5	Self-reported data, potential for underreporting.	Yes, scholarly project supports individual interventions for students who have a positive score on the

Article Title, Author, etc. (Current APA Format)	Study Purpose	Sample (Characteristics of the Sample: Demographics, etc.)	Methods	Study Results	Level of Evidence (Use Melnyk Framework)	Study Limitations	Would Use as Evidence to Support a Change? (Yes or No) Provide Rationale.
				making), mindfulness and acceptance and commitment therapy may help reduce the high-risk drinking behaviors of college students.			alcohol screening tool.

Appendix B—Permission to Use the Iowa Model Revised

Permission to Use The Iowa Model Revised: Evidence-Based Practice to Promote Excellence in Health Care

1 message

Kimberly Jordan - University of Iowa Hospitals and Clinics <noreply@qualtrics-survey.com> Mon, Nov 4, 2019 at 8:44 PM
Reply-To: Kimberly Jordan - University of Iowa Hospitals and Clinics <kimberly-jordan@uiowa.edu>
To: dockeryt@gmail.com

You have permission, as requested today, to review and/or reproduce *The Iowa Model Revised: Evidence-Based Practice to Promote Excellence in Health Care.* Click the link below to open.

The Iowa Model Revised: Evidence-Based Practice to Promote Excellence in Health Care

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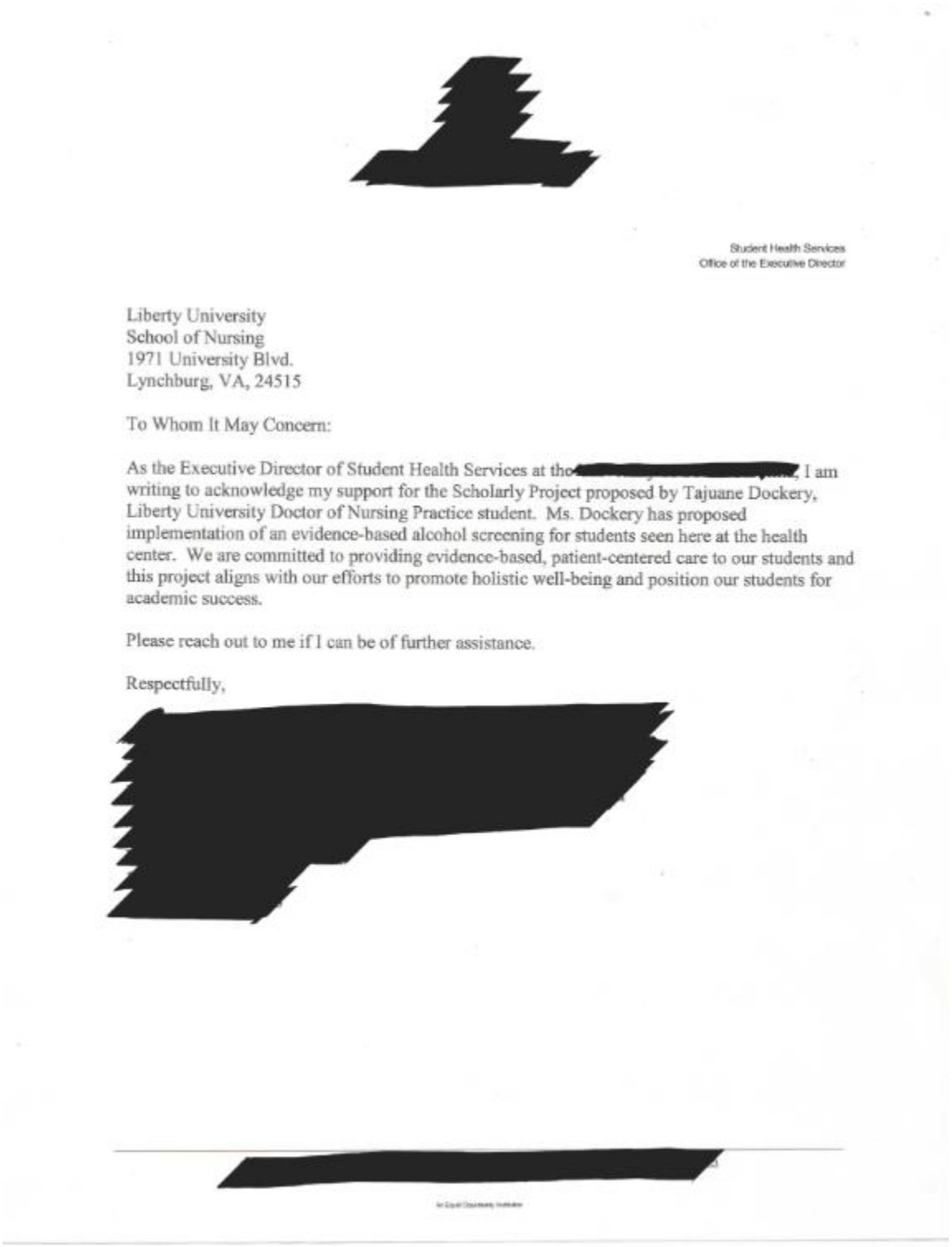
Citation: Iowa Model Collaborative. (2017). Iowa model of evidence-based practice: Revisions and validation. *Worldviews on Evidence-Based Nursing, 14(3), 175-182. doi:10.1111/wvn.12223*

> In written material, please add the following statement:
> *Used/reprinted with permission from the University of Iowa Hospitals and Clinics, copyright 2015. For permission to use or reproduce, please contact the University of Iowa Hospitals and Clinics at 319-384-9098.*

Please contact UIHCNursingResearchandEBP@uiowa.edu or 319-384-9098 with questions.

Appendix C—Letter of Support



[redacted]

Student Health Services
Office of the Executive Director

Liberty University
School of Nursing
1971 University Blvd.
Lynchburg, VA, 24515

To Whom It May Concern:

As the Executive Director of Student Health Services at tho[redacted], I am writing to acknowledge my support for the Scholarly Project proposed by Tajuane Dockery, Liberty University Doctor of Nursing Practice student. Ms. Dockery has proposed implementation of an evidence-based alcohol screening for students seen here at the health center. We are committed to providing evidence-based, patient-centered care to our students and this project aligns with our efforts to promote holistic well-being and position our students for academic success.

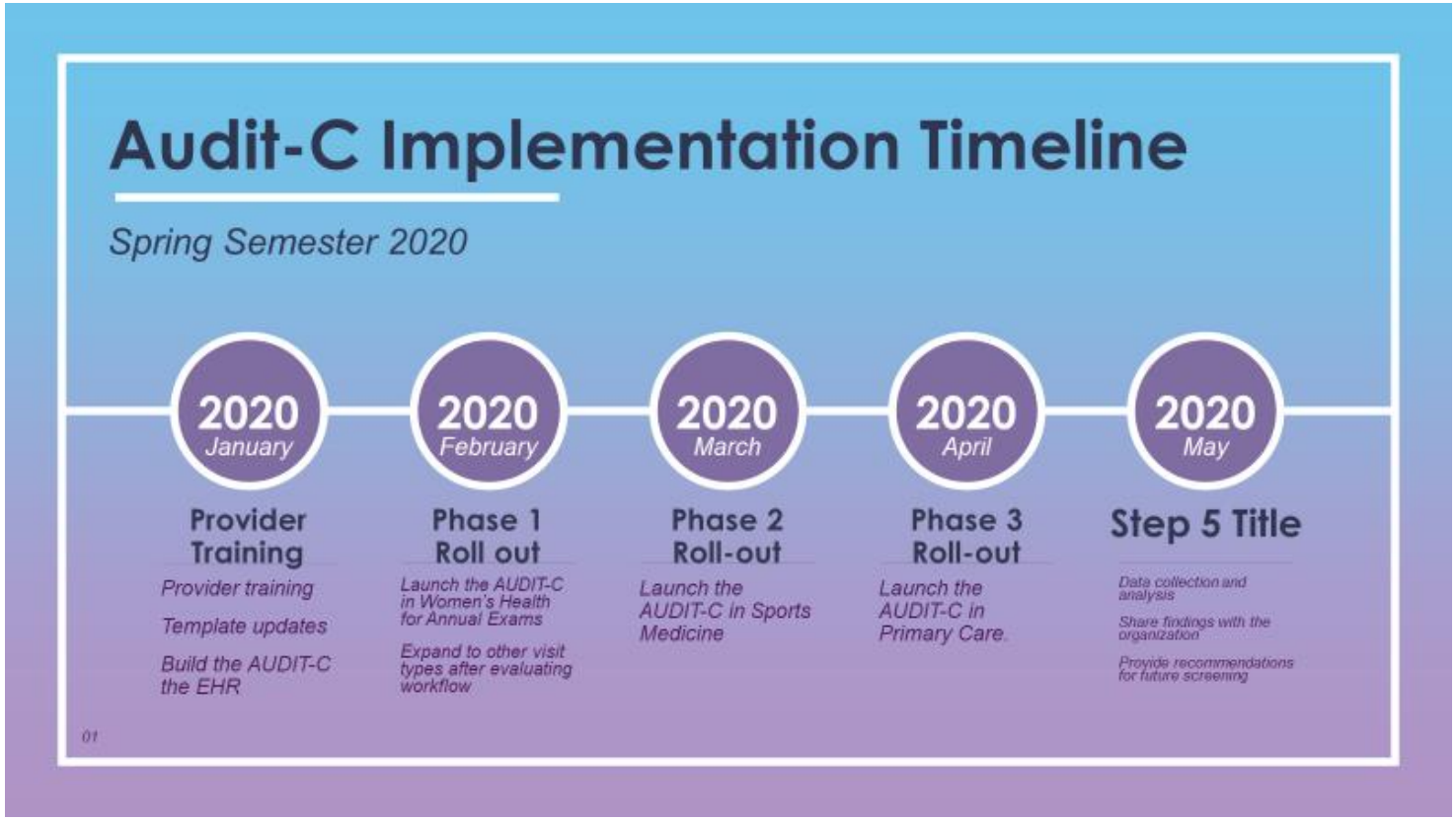
Please reach out to me if I can be of further assistance.

Respectfully,

[redacted]

[redacted]

Appendix D—AUDIT-C Implementation Timeline



Appendix E—CITI Training Certificate

CITI PROGRAM

Completion Date 20-Oct-2019
Expiration Date 19-Oct-2022
Record ID 33800196

This is to certify that:

Tajuane Dockery

Has completed the following CITI Program course:

Biomedical Research - Basic/Refresher (Curriculum Group)
Biomedical & Health Science Researchers (Course Learner Group)
1 - Basic Course (Stage)

Under requirements set by:

Liberty University

CITI
Collaborative Institutional Training Initiative

Verify at www.citiprogram.org/verify/?wea6c9b39-05ae-4247-ba5c-8d265c029203-33800196

Appendix F—Liberty University Institutional Review Board Approval

LIBERTY UNIVERSITY.
INSTITUTIONAL REVIEW BOARD

January 15, 2020

Tajuane Dockery
IRB Application 4198: Using SBIRT to Address Problematic Alcohol Use at a University Student Health Center

Dear Tajuane Dockery,

The Liberty University Institutional Review Board has reviewed your application in accordance with the Office for Human Research Protections (OHRP) and Food and Drug Administration (FDA) regulations and finds your study does not classify as human subjects research. This means you may begin your research with the data safeguarding methods mentioned in your IRB application.

Your study does not classify as human subjects research because evidence-based practice projects are considered quality improvement activities, which are not considered "research" according to 45 CFR 46.102(d).

Please note that this decision only applies to your current research application, and any changes to your protocol must be reported to the Liberty IRB for verification of continued non-human subjects research status. You may report these changes by submitting a new application to the IRB and referencing the above IRB Application number.

If you have any questions about this determination or need assistance in identifying whether possible changes to your protocol would change your application's status, please email us at irb@liberty.edu.

Sincerely,

[redacted]

Administrative Chair of Institutional Research
Research Ethics Office

LIBERTY
UNIVERSITY.
Liberty University | Training Champions for Christ since 1971

Appendix G—AUDIT-C Screening Tool

AUDIT-C Questionnaire

Patient Name _____ Date of Visit _____

1. How often do you have a drink containing alcohol?

- ☐ a. Never
- ☐ b. Monthly or less
- ☐ c. 2-4 times a month
- ☐ d. 2-3 times a week
- ☐ e. 4 or more times a week

2. How many standard drinks containing alcohol do you have on a typical day?

- ☐ a. 1 or 2
- ☐ b. 3 or 4
- ☐ c. 5 or 6
- ☐ d. 7 to 9
- ☐ e. 10 or more

3. How often do you have six or more drinks on one occasion?

- ☐ a. Never
- ☐ b. Less than monthly
- ☐ c. Monthly
- ☐ d. Weekly
- ☐ e. Daily or almost daily

AUDIT-C is available for use in the public domain.

Appendix H—Patient Feedback Letter (Low-risk, Moderate-risk, High-Risk)

$CurrentDate$

Subject: Alcohol Screening Feedback

Dear $PatientFirstName$

As you checked in for your appointment today, you completed a short alcohol-use screening questionnaire. Your responses indicated that your use of alcohol is in the Low to No Risk category. This is also the category that include non-drinkers. This pattern of use poses the lowest risk to your health and academic performance! Keep it up!

In actuality, most USC students are just like you; 69% of USC students fall into this category.* There's so much to do on campus and ways to connect with other students who don't drink.

- Gamecock Entertainment offers programs all week, including their Thursdays After Dark series: https://www.sc.edu/about/offices_and_divisions/russell_house/things_to_do/index.php
- Campus Recreation hosts competitions, events, and outdoor adventure: https://sc.edu/about/offices_and_divisions/campus_recreation/
- If you live on campus, your residence hall is a great place to find connections. Check out your Hall Government and Residence Hall Association on Garnet Gate: https://garnetgate.sa.sc.edu/organization/rha

SAPE has this list of healthy and fun ideas around Columbia: https://sc.edu/about/offices_and_divisions/substance_abuse_prevention_and_education/healthy-choices/index.php

"*" Based on alcohol.edu and National College Health Assessment data from 2019.

Sincerely

$ProviderFullName$

$CurrentDate$

Subject: Alcohol Screening Feedback

Dear $PatientFirstName$

As you checked in for your appointment today, you completed a short alcohol-use screening questionnaire. Your responses indicated that your use of alcohol could put you at risk for alcohol related consequences. These could range from health issues like sleep problems or decreased immunity or to other serious issues like not doing well on an academic assignment or getting a ticket.

We would like to encourage you to look a bit closer at how to avoid harm from drinking. This is a link to an anonymous non-judgmental feedback program called ScreenU; it takes about 10 minutes to complete: https://app.screenu.org/screening/ada197b1-d123-4b1d-80fb-f8ab68f9cb28

Have more questions? You can talk with your medical provider, the staff at SAPE (Substance Abuse Prevention & Education), or self-enroll in STIR, a free, confidential one-on-one program for students interested in making changes in their alcohol and drug use. Here is a link that can be used to schedule an appointment for STIR:
https://sc.edu/about/offices_and_divisions/substance_abuse_prevention_and_education/stir-screening-intervention/index.php

The SAPE staff may also be reached at 803-777-3933.

Sincerely

$ProviderFullName$

$CurrentDate$

Subject: Alcohol Screening Feedback

Dear $PatientFirstName$

As you checked in for your appointment today, you completed a short alcohol-use screening questionnaire. Your responses indicated that your use of alcohol could put you at high risk for alcohol related consequences. These could range from health issues like sleep problems or decreased immunity or to other serious issues like not doing well on an academic assignment or getting a ticket.

Your medical provider will likely have encouraged you to complete STIR, a free, confidential one-on-one program for students interested in making changes in their alcohol and drug use. https://sc.edu/about/offices_and_divisions/substance_abuse_prevention_and_education/stir-screening-intervention/index.php

Not so sure? We like to encourage you to look a bit closer at how to avoid harm from drinking. This is a link to an anonymous non-judgmental feedback program called ScreenU; it takes about 10 minutes to complete: https://app.screenu.org/screening/ada197b1-d123-4b1d-80fb-f8ab68f9cb28. Or maybe track your drinking for a few weeks to take a better look for yourself.

Have more questions? You can talk with your medical provider or the staff at SAPE (Substance Abuse Prevention & Education). The SAPE staff may be reached at 803-777-3933.

Sincerely,

$ProviderFullName$

Appendix I—SBIRT Workflow