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Improving Alcohol Screening and Brief Intervention in Community Health Settings: Training and Evaluation

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and Evaluation

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Abstract

Background: Excessive alcohol use is responsible for 88,000 deaths in the United States each year. Alcohol Screening and Brief Intervention (ASBI) is highly effective for the prevention and treatment of harmful alcohol use in community healthcare settings; however, this intervention is not widely used by healthcare professionals. A structured search of bibliographic databases was conducted to locate evidence-based articles pertaining to barriers to ASBI. Evidence suggests that the lack of knowledge and confidence is responsible for the underutilization of ASBI.

Purpose: To assess the impact of ASBI training on nursing staff knowledge, attitude and confidence and to make ASBI a routine and systematic practice.

Methods: Fifteen participants attended two ASBI education workshops. Case scenarios in the form of screening simulation were utilized to reinforce key concepts. Nine participants completed a paper-based survey questionnaire administered before and after ASBI training. Data was collected using a quantitative approach via self-report numeric rating questions. To draw conclusions about the true impact of ASBI training, pre and post survey scores were compared, and the main outcome means were analyzed using a paired- sample t- test.

Results: Four questions related to ASBI knowledge, attitude and confidence were included in the questionnaire. Post- training mean scores in all four outcome domains were higher than pre- training mean scores and results in the main training outcome were statistically significant.

Conclusion: The successful implementation of this project provides evidence that education interventions can be effective at improving competence and comfort in delivering alcohol screening and brief intervention in community healthcare settings.

Key words: alcohol screening, screening attitudes, alcohol screening barriers, obstacles to alcohol screening, nurses and alcohol screening, SBI implementation.

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Introduction

Three million deaths occur every year as a result of harmful alcohol use; alcohol is a

causal factor in more than 200 disease and injury conditions (WHO, 2018). Excessive alcohol

use (defined as drinking 5 or more drinks on an occasion for men or 4 or more drinks on an

occasion for women), can lead to increased risk of health problems such as injuries, violence,

liver diseases, and cancer (CDC, 2018). Beyond health consequences, the harmful use of alcohol

brings significant social and economic losses to individuals and society at large (WHO, 2018).

Alcohol prevention approaches can be effective in reducing risky drinking when applied as part

of routine screening procedures in community healthcare settings. According to evidence,

accurate screening is key to preventing problems arising from risky alcohol use particularly

when applied as part of routine screening procedures in healthcare settings but poor screening

skills, knowledge in carrying out brief interventions and negative attitudes toward alcohol users

by health professionals in community settings have all been cited as barriers (Derges et al.,

2017).

Background

Forty percent of American adults consume excessive amounts of alcohol according to a

recent study led by Boston University School of Public Health (BUSM, 2018). Excessive alcohol

use is responsible for 88,000 deaths in the United States alone each year. Diseases associated

with alcohol consumption include cardiomyopathy, arrhythmias, stroke, high blood pressure,

fatty liver, hepatitis, liver fibrosis and cirrhosis. Heavy alcohol consumption is associated to liver

and pancreatic cancer, head and neck cancer, esophageal cancer, breast and colorectal cancer

(ACS, 2017). Brain disruptions associated with harmful alcohol use can impact mood, behavior and coordination. In 2015, there were 78,529 liver disease deaths among individuals ages 12 and older; of all these cases, 47.0 percent involved alcohol consumption (NIAAA, 2018). Risky and hazardous alcohol use is associated with considerable economic and social consequences. Drinking too much cost the United States $249 billion in 2010 (CDC, 2018). In 2016, 10,497 people died in alcohol-impaired driving crashes, accounting for 28% of all traffic-related deaths in the United States (CDC, 2019).

Every day, 29 people in the United States die in motor vehicle crashes that involve an alcohol-impaired driver; this represents one death every 50 minutes; the annual cost of alcohol-related crashes totals more than $44 billion (CDC, 2017). The risk of unhealthy alcohol use is indicated by the dramatic increase in excessive drinking among adults and results from the lack of systematic alcohol screening and brief intervention by nursing professionals and healthcare staff in community health settings. The U.S. Preventive Services Task Force (2018), recommends screening for unhealthy alcohol use in adults 18 years or older including pregnant women and providing persons engaged in risky hazardous drinking with brief behavioral interventions to reduce unhealthy alcohol use. All insurance plans provide complete coverage for alcohol screening and counseling when services are delivered by network providers (AHRQ, 2015). The Unhealthy Alcohol Use Screening and Follow-Up (ASF) measure recently added to the Health Effectiveness Data Information Set 2017 (HEDIS) is the first measure introduced to evaluate health plan performance on unhealthy alcohol use, screening and follow-up care for the general adult population. This measure targets screening (the percentage of members who were assessed for unhealthy alcohol use via a standardized tool) and counseling or follow up care (the percentage of members who received brief counseling or other follow-up care within 2 months of

a positive screening) (NCQA, 2018). The CMS MIPS Measure 431 is intended to monitor the percentage of patients aged 18 years and older who were screened for unhealthy alcohol use using a systematic screening method at least once within the last 24 months and who received brief counseling if identified as an unhealthy alcohol user.

According to the Agency for Healthcare Research and Quality (AHRQ, 2015), barriers to alcohol screening include the perceived lack of provider time, the lack of familiarity with screening tools, the lack of training and the lack of available treatment resources. Some ideas to address these barriers include strategies, such as the routine use of recommended screening tools, staff training and workflow redesign to make alcohol screening a routine and systematic practice.

Problem Statement

The risk of unhealthy alcohol use (defined by NIAAA as drinking more than four drinks per day or 14 in a week for men, and more than three drinks a day or seven per week for women) is indicated by the dramatic increase of excessive drinking and results from the underutilization of ASBI by healthcare professionals in community health settings.

Organizational Gap and Analysis of Project Site

Alcohol misuse including heavy drinking has become a serious public health problem. Despite the prevalence and health impact of alcohol misuse, and recommendations for use of regular screening, many providers report lack of preparation and confidence in the identification, treatment, and referral (Rizer & Lusk, 2017). Nursing professionals and other staff working in community based mental health clinics can be instrumental in delivering substance use services including alcohol screening. However, research studies including work done by the National Committee for Quality Assurance (NCQA) have consistently shown low alcohol screening and follow-up rates (NCQA, 2018). A need assessment was conducted by the DNP student in 2018

at a community - based outpatient setting that provides neuropsychiatry, psychiatry, psychotherapy and dual diagnosis services to youth, adolescents, adults and families. Office and clinical staff at this site include front desk associates, therapists, registered nurses, nurse practitioners and medical doctors. Approximately four out of eight adult patients that the DNP student assessed for mental health complains reported using alcohol. According to practice guidelines used by the clinic, all patients seen by mental health providers for medication evaluation or follow up were given a brief substance abuse psycho education intervention if time allowed it during their encounter. Many clinical providers and associated staff did not feel confident in conducting systematic ASBI. ASBI was not a routine practice as it was provided on a need basis for patients requiring immediate intervention. Thus, the need for improvement and innovation. ASBI provided as a routine and systematic basis to patients at high risk will allow for prevention, early intervention and follow up.

Review of the Literature

A structured electronic search of bibliographic databases was conducted through Medline, Ovid, PsychInfo, Cumulative Index of Nursing and Allied Health Literature (CINAHL), and Google Scholar. Key terms used to locate relevant articles included alcohol, alcohol screening, nurses and alcohol screening, alcohol screening attitudes, alcohol screening barriers, obstacles to alcohol screening, alcohol screening improvement, SBI, and SBIRT implementation. A total of 156 peer-reviewed articles published between 2015 and 2019 were retrieved and reviewed for relevance. Criteria used to select articles for the next stage of review included: full-text peer-reviewed articles written in English, less than five years old directly related to unhealthy alcohol use, screening and brief intervention, barriers, and strategies to improve systematic alcohol screening and brief intervention among nurses. Exclusion criteria

included articles non-relevant to alcohol screening, articles more than five years old written in languages other than English and non-peer- reviewed. Twelve articles were selected and eight were included in this review of the literature. JHNEBP evidence rating scales were used to evaluate the strength and quality of evidence. Selected articles included evidence levels three, level four, and five.

Unhealthy Alcohol Use, Screening and Brief Intervention

An estimated 88,000 people (approximately 62,000 men and 26,000 women) die from alcohol-related causes annually, making alcohol the third leading preventable cause of death in the United States (NIAAA, 2018). Given the extend to this problem, the USPSTF recommended screening for unhealthy alcohol use in adults 18 years or older, including pregnant women, and providing persons engaged in risky or hazardous drinking with brief behavioral counseling interventions to reduce unhealthy alcohol use (Curry et al., 2018, p. 1899). Screening Brief Intervention (SBI) is a comprehensive, integrated, public health approach to deliver the early intervention to individuals with risky alcohol use (Mitchell et al., 2018). Practice nurses (including nurse practitioners and nurse practitioner students), mental health counselors, and office staff can play a crucial role in planning and delivering appropriate interventions intended to prevent or reduce unhealthy alcohol use. Health promotion and disease prevention are part of nursing roles and responsibilities. Dawson, Nkowane, and Whelan (2015) noted that nurses and midwives play a crucial role in empowering patients and strengthening community involvement in their health through knowing and understanding the health needs of local populations and targeting interventions to meet the broader determinants of health.

Excessive alcohol use, defined as a significant health threat in our communities, is the leading cause of death and a preventable risk factor to more than 200 diseases and conditions (Mitchell et al., 2018). Alcohol screening and brief intervention (SBI) have not been widely disseminated, and nursing, the largest and most trusted sector of the health care workforce, is perfectly poised to close this gap by routinely screening and giving patient's brief feedback on alcohol consumption but they rarely ask patients about alcohol use (Mitchell et al., 2018, p. 467). Derges et al., (2017) concluded that health professionals in clinical settings acknowledge the importance of addressing alcohol as a public health concern, but they feel under-skilled, lacking knowledge about alcohol screening and its impact on health.

ASBI and Training

Previous research on training health professionals to identify and address unhealthy alcohol and drug use in patients through screening, brief intervention, and referral to treatment (SBIRT), has also found that training increases knowledge about substance use and increases students' confidence in addressing substance use in patients (Covington et al., 2018, p. 125). Within a U.S. SBIRT training consortium, advanced practice registered nurse (APRN) students were trained and required to practice SBIRT in clinical settings. Results showed that training increased student knowledge skills and confidence in asking about alcohol and drug use (Covington et al., 2018, p. 126). Education series and workshops can be instrumental in alcohol screening and brief intervention training. Healthcare providers demonstrated improved self-reported knowledge of screening and brief intervention after attending workshops for screening, brief intervention, and referral to treatment (Rosenthal, Barnes, Aagaard, Cook &Weber, 2818, p. 228). Mitchell et al. (2017) found that participants have reported more global improvements in attitudes toward patients who use alcohol after training but due to difference in roles and scope

of practice, it has been suggested that SBIRT training should be tailored to each healthcare profession (Rosenthal, et al., 2018, p. 228). Staff training can facilitate the successful implementation of Alcohol Screening and Brief Intervention (ASBI) in healthcare and community-based psychiatric outpatient settings.

ASBI, Process and Behavioral Change

Redesigning the existing workflow to accommodate the change in screening protocol is an important component to ASBI. According to research, professionals not only need to develop new knowledge and skills in alcohol screening, but they also need environments that will support this work (Derges et al., 2017). Another key concern noted by these authors that could deter staff from screening patients was the potential damage to patient relationship; the fears for stigmatizing or victimizing people unnecessarily was perceived to be detrimental to good practice (Derges et al., 2017). Such barriers may be surmounted by education, training, and structural changes (Mitchell et al., 2017, p. 33). ASBI emerged from SBIRT, an evidenced based public approach to identify, reduce and prevent problem use, abuse and dependence on alcohol and illicit substances (SAMHSA, 2020). Nursing professionals are responsible for providing patients with evidence-based ASBI to help individuals who are drinking above usual recommendations.

Theoretical Framework: Diffusion of Innovation (DOI)

DOI was developed by E.M. Rogers in 1962. The theory explains how a new idea or intervention gains momentum and spreads through a specific population or health system (BUSPH, 2018). In public health, DOI is used to accelerate the adoption of crucial public health programs and evidenced-based interventions that are typically aimed at changing the behavior of a social system (BUSPH, 2018). The end result of this diffusion is the change through the

adoption of the new idea or intervention (BUSPH, 2018). According to Mohammadi, Poursaberi

and Salahshoor (2017), Rogers's diffusion of innovation model, contains three main steps:

knowledge, persuasion, and decision (see Appendix A for the Process of Adoption in Roger's

Diffusion of Innovation Model). Knowledge is produced when an individual is exposed to an

existing innovation and acquires some understanding about its mechanisms and functions. To

reach the persuasion stage, the individual must form a view toward the innovation based on its

perceived attributes (relative advantage, complexity, and so on). For the decision to occur, the

individual must be involved in an activity that would ultimately require him or her to choose

between using or dismissing the innovation (Mohammadi, Poursaberi & Salahshoor (2017).

Using the DOI model, the DNP student was able to identify an evidenced-based solution that

could help in curving the risky and hazardous alcohol use epidemy, thereby improving patient

outcome as well as nursing practice. After the adoption of the evidence-based intervention, the

DNP was able to move to the implementation phase using the same DOI theory. Rogers mapped

out this model, stressing that in most cases, an initial few in the organization will be open to the

new idea and will adopt its use; as these early innovators spread the word more and more people

will become open to its adoption; this will lead to the development of a critical mass (Kaminski,

2011). Overtime, according to Kaminski (2011), the innovative idea or intervention will be

diffused among the population until a saturation point is achieved. Rogers distinguished five

categories of adopters of an innovation: innovators, early adopters, early majority, late majority,

and laggards; sometimes, a sixth group is added: the non-adopters (Kaminski, 2011). The DNP

student intended to be among early adopters of the evidence-based intervention also called

change agents who, by their behavior are responsible for diffusing the innovation and thus,

influencing their peers through peer to peer communication, and role modeling the change in

practice. The five categories of DOI adopters are illustrated in the bell-shaped curve image (see Appendix B for DOI Adopter Categories).

Methods

Goal, Objectives and Expected Outcomes

The DNP student conducted a need assessment at a community-based outpatient psychiatric clinic that provides neuropsychiatry, psychiatry, psychotherapy and dual diagnosis services to youth, adolescents, adults and families. Approximately four out of eight adult patients assessed by the DNP student reported drinking alcohol. Alcohol screening was not conducted on a routine and systematic basis, but most patients received a brief substance abuse psycho-education intervention during their encounter if time allowed. Most staff members did not feel comfortable conducting routine screenings. Routine substance use screening was identified as a critical practice gap in need of an evidence-based training intervention. The expected outcome was that improved alcohol screening and brief intervention knowledge would increase staff's confidence to screen for alcohol use and support routinization of a systemic practice of alcohol screening.

The goal of this project was to improve staff's alcohol screening and brief intervention skills through training. The main objective was to make screening a routine and systematic practice at the project site via a workflow change.

The training was built on existing knowledge and skills to help participants feel competent and confident in conducting systematic ASBI. At the end of the training, participants were expected to verbalize:

- An increase or improvement of their overall knowledge of systematic alcohol screening

and brief intervention

- increase or improvement of their motivation and attitude toward alcohol screening and brief intervention,

- Increase or improvement of their comfort level as well as their confidence in discussing alcohol related issues and behavior change.

- An improvement of their ability to mentor colleagues on alcohol screening and brief intervention.

Using DOI, we predicted that improved knowledge, confidence, and attitude would then allow all staff to adopt ASBI as a routine and systematic practice in the decision phase (Mohammadi, Poursaberi & Salahshoor, 2017). A paper-based survey was administered before and after the training. The pre- training survey was designed to capture participants ASBI baseline knowledge and behaviors. The post- training survey was designed to capture the net gain or the difference between the pre- existing or pre-training learning level and the post training learning level. To draw conclusions about the true impact of ASBI training, the difference in pre and post mean scores was analyzed using a paired sample t-test and SPSS.

Project Site and Population

This project was completed in a large multi-cultural suburban community health center that offers mental health and dual diagnosis services. A vast majority of patients at this site were treated for depression and anxiety and many reported drinking alcohol. Clinical and office resources at this site include psychiatrists, mental health nurse practitioners, nurse practitioner students, registered nurses, mental health counselors, therapists, office managers, billing associates, schedulers and office clerks.

This project did not include individual patients; the targeted population was nursing professional's composed registered nurses and nurse practitioners. However, we decided to include all healthcare staff that could benefit from ASBI. Fifteen health care staff including one registered nurse (RN), one nurse practitioner (NP), one NP student, two mental health counselors, five therapists and five office staff members participated in this project. Only nine healthcare staff including one RN, one NP, one NP student, one counselor and five office staff members completed the pre and post-training survey. All project participants were chosen through convenience sampling and survey completion was voluntarily.

Measurement Instruments

The DOI model was used to identify and select evidenced-based knowledge that needed to be widely diffused and integrated into routine practice at the project site. The USPSTF recommended alcohol screening instruments include the abbreviated Alcohol Use Disorders Identification Test–Consumption (AUDIT-C) and the NIAAA Single Alcohol Screening Question (USPSTF, 2018). After careful review, the AUDIT-C offered relative advantages over the NIAAA Single alcohol Screening Question as evidenced by a good test-retest reliability (intraclass correlation coefficient for test-retest reliability = 0.91) and a satisfactory validity indicated by sensitivity = 81.8%, specificity = 79.8% (Jeong et al., 2017). The AUDIT-C was selected as screening tool for the project.

The AUDIT- C

The AUDIT-C is a 3-item instrument that screens patients for binge drinking and alcohol consumption above recommended guidelines on a weekly and monthly basis. Question 1 ask patient how often they have a drink containing alcohol. Answer options include a. Never, b. Monthly or less, c. 2-4 times a month, d. 2-3 times a week and e. 4 or more times a week.

Question 2 ask patients about the number of standard drinks containing alcohol they consumed on a typical day. Answer options include for question 2 include a. 1 or 2, b. 3 or 4, c. 5 or 6, d. 7 to 9 and e. 10 or more . Question 3 ask patients how often they have six or more drinks on one occasion? Answer options for this question include a. Never, b. Less than monthly c. Monthly, d. Weekly and e. Daily or almost daily (see Appendix C and D for the AUDIT- C Overview and Questionnaire).

The AUDIT-C is scored on a scale of 0-12. Each AUDIT-C question has 5 answer options a, b, c, d and e. Points allotted for each question are zero for each a- answer option, one point for each b- answer option, two points for each c- answer option, three points for each d- answer c option and four points for each e- answer option. In men, a score of 4 or more is considered positive and optimal for identifying hazardous drinking or active alcohol use disorders (AUD). In women, a score of 3 or more is optimal for identifying hazardous drinking or active AUD. However, when the points are all from question 1 alone with question 2 and 3 score of zero, it can be assumed that the patient is drinking within recommended limits. Since prevention of alcohol-related health problems is an important public health issue, many different screening tools and intervention strategies have to be evaluated in order to reach patients with both hazardous and harmful alcohol consumption within the healthcare system (Johansson, Bendtsen & Åkerlind, 2005).

Alcohol Brief Intervention

The purpose for brief counseling intervention is to motivate individuals at risk for unhealthy alcohol use and related health problems to change their behavior (SAMHSA, 2020). Brief intervention helps moderate and high-risk patients to understand how their alcohol use puts them at risk and to reduce or give up their substance use (see Appendix E for SBIRT Process).

According to CMS guidelines, counseling for unhealthy alcohol use refers to one or more counseling sessions, a minimum of 5-15 minutes, which may include: feedback on alcohol use and harms; identification of high-risk situations for drinking and coping strategies; increased motivation and the development of a personal plan to reduce drinking (CMS, 2018). The three counseling key components designed to enhance patients' motivation for change include: assessment for readiness to change, helping patients to see discrepancies or differences between their present behavior and concerns, listening reflectively, and asking open-ended questions (U.S. Department of Health and Human Services, 2019).

Project Implementation

ASBI Education Workshops

Two education workshops of two hours duration by session were held between 12 and 2 pm on October 25, 2019, and October 30, 2019, at the project site. Workshop time were chosen to accommodate for participant work schedules. Ten participants attended the first workshop on October 25, 2019, and five attended the second workshop on October 30, 2019. Medical Doctors were given a brief face to face orientation to the project.

The DNP student was responsible for developing the training material. Learning modules included what the health care workers needed to know to be successful in delivering ASBI in a community health setting. Various strategies aiming at energizing the adult learning interest, including power points, screening tools, graphic prints, and brochures related to ASBI were utilized to illustrate screening interactions and brief intervention processes. Training themes and concepts included orientation to systematic screening, planning screening procedures, a validated alcohol screening tool: the Abbreviated Alcohol Use Disorders Identification Test–Consumption (AUDIT-C), planning brief intervention procedures, and orientation to specific roles during the

implementation process. Risky drinking can result in problems that create costs for the individual

drinkers, their families and entire communities (APHA, 2016). Communities are affected

financially by the increase in health care, public safety, and social service costs, and emotionally

by the increase in illness, disability, and death. SBI can help reduce these costs and improve the

health of communities (APHA, 2016). The CDC guidelines, the NIAAA guidelines and the

American Public Health Association (APHA) guide for public health practitioners were utilized

to define, explain, and clarify key concepts, goals, and health benefits of ASBI as a public health

response to risky and hazardous drinking.

ASBI key concepts. To improve participants understanding and knowledge of key concepts

related to ASBI, terms such as a standard drink, excessive drinking, and moderate drinking for

healthy men and women were defined and clarified by the DNP student during the education

workshops. The causes of alcohol restrictions in pregnant women and the underage population

were explained. Terms such as binge drinking, drinking and driving, underage drinking, drinking

and pregnancy, and their health risks were defined and clarified; short- and long-term health

risks related to excessive drinking, in general, were clarified. According to CDC guidelines, a

standard drink contains 0.6 ounces (14.0 grams or 1.2 tablespoons) of pure alcohol. A standard

drink is generally found in 12-ounces of beer (5% alcohol content), 8-ounces of malt liquor (7%

alcohol content), 5-ounces of wine (12% alcohol content) or 1.5-ounces of 80-proof (40%

alcohol content) distilled spirits or liquor (see Appendix F for U.S Standard Drink Sizes).

Moderate drinking was defined according to the U.S dietary guidelines as drinking up to one

drink per day for women and up to 2 drinks per day for men. U.S dietary guidelines do not

recommend that individuals who do not drink alcohol start drinking for any reason (CDC, 2019).

Excessive drinking was defined to include binge drinking, heavy drinking, and any drinking by

pregnant women or people younger than age 21. Binge drinking is the most common form of

excessive drinking, defined as consuming four or more drinks during a single occasion for

women and five or more drinks during a single occasion for men. Heavy drinking was defined as

consuming eight or more drinks per week for women and 15 or more drinks per week for men

(CDC, 2019). Underage drinking was defined as any drinking by people-younger than 21 years

of age. Concepts of Minimum Legal Drinking Age (MLDA) were clarified using U.S laws that

specifies that the legal age to purchase alcoholic beverages is 21 years. Concepts related to

alcohol use in pregnancy were explained: there is no known safe amount of alcohol use during

pregnancy and while trying to get pregnant (CDC, 2018). There is also no safe time during

pregnancy to drink; all types of alcohol are equally harmful, including all wines and beer during

pregnancy (CDC, 2018). It was reminded that drinking alcohol during pregnancy can cause

miscarriage, stillbirth, and a range of lifelong physical, behavioral, and intellectual disabilities

(CDC, 2018).

The DNP student further defined Brief interventions (BI) as evidenced-based practices

designed to motivate individuals at risk of substance abuse and related health problems to change

their behavior by helping them understand how their substance use puts them at risk and to

reduce or give up their substance use (SAMHSA, 2020). BI is, in fact, a short conversation

providing screening feedback and advice to clients. The SAMHSA guideline for BI was utilized

to define, explain and clarify key concepts, including building rapport, pros and cons for use,

screening score feedback, readiness to change, and a prescription for change. SAMHSA has

funded grants to implement SBIRT in states, federally qualified health centers, and medical

residencies, and on college campuses across the country (Youth.GOV, n.d.). BI Key

components: be respectful, obtain permission from the client to discuss their alcohol use, Avoid

arguing, or confronting the client. Accept the client's decision; do not push as this may build

resistance to discuss in the future with others. It was essential to warn the client about drinking

based on health benefits: If people choose to drink, they should do so in moderation: up to one

drink a day for women and up to two drinks a day for men; no one should begin drinking or

drink more frequently based on potential health benefits. No one should drink if they are under

age 21, pregnant or may be pregnant or have problems that could be made worse by drinking

(CDC, 2018).

Mocked sessions. Fifteen participants attended two planned education workshops. They

included one registered nurse, one nurse practitioner (NP), one NP student, two mental health

counselors, five therapists and five office staff members**.** After completion of learning modules,

participants were able to demonstrate their ability to engage in ASBI conversation with their

peers (mocked patients) using learned skills. A mocked screening using the AUDIT- C was

conducted during training to assess learning. Participants were instructed to simulate reel patients

by reporting drinking levels closer to levels reported by their patient population.. Most mocked

patients reported drinking amounts that were above recommended guidelines). The mocked

screening was followed by a brief counseling discussion about behavior change. Mocked

providers related feedback empathetically about screening results to their peer-patients; they

clearly explained guidelines for lower-risk alcohol use and ways to reduce or stop drinking.

Process Improvement and Workflow Redesign

Two weeks after completion of ASBI education workshops, the practice workflow for the

entire community health setting was redesigned to include ASBI as a routine and systematic

practice using the AUDIT- C. The leadership at the project site along with all the team of

healthcare workers by deciding to change their practice reached the decision stage which is the terminal phase of the DOI model. The plan was to have all new and existing patients aged 18 years and older seen for two visits or at least one comprehensive visit screened for unhealthy alcohol use and provided a brief intervention starting January 2020. Alcohol screening using the Audit C screening questionnaire is now considered a routine practice at the project site. Screening questionnaires are available at the front desk in English and Spanish. NP's, NP students and MD's are responsible for questionnaire scoring. Based on each patient score, patients with problematic or potential harmful alcohol are provided a brief behavioral intervention during their visit.

Protection of Human Subjects

The University of Massachusetts, Amherst (Umass) Internal Review Board (IRB) approval was obtained prior to initiating the DNP Project (see Appendix G for the Approval Letter by the University of Massachusetts Amherst IRB). The official IRB Determination Form was submitted as soon as the proposal was approved by the leadership team at the project site. Information provided to participants was clear and detailed enough to help them make an informed and voluntary decision about whether or not to participate. No protected Health Information (PHI) was used or disclosed to participants during the two planned education workshops. The DNP project was conducted in accordance with the Privacy Rule of the Health Insurance Portability and Accountability Act (HIPAA) of 1996. Additionally, the DNP student and practice personnel that carefully conduct this project followed the standards of care for practice in community-based outpatient clinics. All information collected as part of evaluating the impact of the DNP project on participants were aggregated data without identifiers. Participant confidentiality was assured by using specific identification numbers. The list of

participants and their identifying numbers was kept in a locked filing cabinet at the main office. This cabinet was only accessible to the DNP student and her associated staff. Waivers for verbal consents were obtained from participants who formally consented but who did not sign consent forms.

Data Collection and Analysis Procedure

The DNP student sought to evaluate the impact of ASBI training on participants. The main approach was to measure the performance score of the same sample of participant before and after completing the training. Data were collected using a quantitative approach via self-report numeric rating scores created by the DNP student and ranging from zero to six (see Appendix H for the Pre and Post Survey Questionnaire). A score of one 1 was considered to be low or not able to conduct alcohol screening and brief intervention. A score of two was considered not really adequate, but almost OK, a score of three was considered adequate, a score of for was considered to be somewhere between OK and high. A score of five was considered high and a score of six was considered excellent. The pre-post difference in means related to all training outcomes (question 1, 2, 3 and 4) was summarized using descriptive statistics and results for the main training outcome (question 1) were analyzed using a paired sample t test to draw conclusions about their statistical significance and outcomes of the educational interventions. To determine whether the difference between the two means was statistically significant, we compared the p-value to the significance level. The test was set with 95% confidence interval (CI) and 8 degrees of freedom (df). Our significance level (alpha) with 95 CI was 0.05. The test was set to capture the mean difference, the standard deviation (SD) of the differences, the standard error of the difference, the lower and upper value, the test statistic (t), the df and the p value. If the p-value was less than or equal to the significance level, we would conclude that the

difference between pre and post means was statistically significant. If the p-value was greater than the significance level, the decision was to fail to reject the null hypothesis because of the lack of evidence to conclude that the difference between the population means was statistically significant.

Results

The DNP project was developed as a quality improvement project to address ASBI, a specific area of clinical lag at the project site. Fifteen adult participants, including one registered nurse (RN), one nurse practitioner (NP), one NP student, two mental health counselors (MHC), five therapists and five office staff members, attended two planned education workshops. Nine female participants from the project site composed of one RN, one NP, one NP student, one MHC and five office staff members completed the pre and post-training survey. The pre- training survey was designed to capture participants ASBI baseline knowledge and behaviors. The post-training survey was designed to capture the net gain or the difference between the pre- existing or pre-training learning level and the post training learning level. In general, pre and post survey scores showed a remarkable improvement in all outcome domains, including participant's overall knowledge of systematic ASBI, their motivation, and attitude toward ASBI, their comfort and confidence when discussing alcohol-related issues and behavior change.

Data Summary

For question 1, the same group of participants was asked to rate their overall knowledge of systematic ASBI before and after the training. The total number of completed cases pre and post training with no missing data was nine. Computed results in Tables 5 show that the median score before the training was one with a range of two. The minimum score was one and the

maximum score was three. The average score before the training was 1.4 with a SD of 0.8. After

the training, the median score was six with a range of one. The minimum reported score was five

and the maximum reported score was six. After the training, the average score was 5.8 with a SD

of 0.3. The mean difference before and after the training was 4.4 with a SD of 0.88.

Tables 1

1. *Table 1. Question 1 Pre and Post Training Scores*

On Staff's Overall Knowledge of Systematic Alcohol Screening and Brief Intervention

Participant ID	Pre training survey scores	Post training survey scores
1	1	6
2	1	6
3	3	6
4	3	6
5	1	6
6	1	6
7	1	6
8	1	6
9	1	5

2. Table 2. Question 1 Descriptive Statistics

Same group	Median score	Range score	Minimum score	Maximum score	Mean	SD
Pre training N= 9	1	2	1	3	1.4444	0.881
Post training N=9	6	1	5	6	5.8889	0.333

For question 2, the same group of participants was asked to rate their motivation and attitude toward ASBI before and after the training. The total number of completed cases pre and post training with no missing data was nine. Computed results in Tables 2 show that the median score before the training was three with a range of one. The minimum score was two and the maximum score was three. Before the training, the average score was 2.55 with a SD of 0.52. After the training, the median score was five with a range of one. The minimum score was five and the maximum score was six. The average score after the training was 5.3 with a SD of 0.5. The pre and post mean difference was 2.7 with a SD of 0.6.

Tables 2

1. *Table 1. Question 2 Pre and Post Training Scores*

   On Staff's Motivation and Attitude toward Alcohol Screening

Participant ID	Pre training survey scores	Post training survey scores

1	2	6
2	3	5
3	2	5
4	2	5
5	3	5
6	3	5
7	2	5
8	3	6
9	3	6

2. *Table 2. Question 2 Descriptive Statistics*

Same group	Median score	Range score	Minimum score	Maximum score	Mean	SD
Pre training N=9	3	1	2	3	2.555	0.527
Post training N= 9	5	1	5	6	5.333	0.500

For question 3, the same group of participants was asked to rate their comfort and confidence when discussing alcohol related issues and behavior change before and after the

training. The total number of completed cases with no missing data was nine. Computed results

in Tables 3 show that before the training, the median score was two with a range of 1. The

minimum score was two and the maximum score was three. The average score before the

training was 2.4 with a SD of 0.5. After the training, the median score was five with a range of

two. The minimum score was four and the maximum score was six. After the training, the

average score was 4.8 with a SD of 0.7. The mean difference before and after the training was

2.4 with a SD of 0.5.

Tables 3

    1. *Table 1. Question 3 Pre and Post Training Scores*

Staff's Comfort and Confidence Level in Toward Screening and Brief Counseling

Participant ID	Pre training survey scores	Post training survey scores
1	2	5
2	2	4
3	3	5
4	2	4
5	3	5
6	2	5
7	2	4
8	3	6
9	3	6

2. *Table 2. Question 3 Descriptive Statistics*

Same group	Median score	Range score	Minimum score	Maximum score	Mean	SD
Pre training N=9	2	1	2	3	2.444	0.527
Post training N= 9	5	2	4	6	4.888	0.781

For question 4, the same group of participants was asked to rate their ability/willingness desire/intent to mentor colleagues on alcohol screening and brief intervention before and after the training. The total number of completed cases with no missing data was nine. Computed results in Tables 4 show that median score before the training was two with a range of one. The minimum score was two and the maximum score was three. The mean score before the training was 2.2 with a SD of 0.4. After the training, the median score was five with a range of two. The minimum score was four and the maximum score was six. The mean score after the training was 4.7 with a SD of 0.8. The mean difference before and after the training was 2.5 with a SD of 1.1. Tables 4

1. *Table 1 Question 4 Pre and post training scores on Staff's Ability, Desire or Intent to Mentor Colleagues on Alcohol Screening and Brief Intervention*

Participant ID	Pre training survey scores	Post training survey scores
1	2	4
2	2	4
3	2	5
4	2	5
5	3	4
6	3	4
7	2	5
8	2	6
9	2	6

2. *Table 2. Question 4 Descriptive Statistics*

Same group	Median score	Range score	Minimum score	Maximum score	Mean	SD
Pre training N=9	2	1	2	3	2.222	0.440
Post training N= 9	5	2	4	6	4.777	0.833

Paired Samples T- Test

A paired samples t test was applied to survey scores related to the main training outcome (question1). Results in Tables 5 were interpreted for statistical significance.

Table 5

1. *Output for paired samples test with 95% confidence interval and 8 df*

	Mean	SD	Std error Mean	Lower value	Upper value	*t* value	df	Sig. (2 tailed)
Pre training mean– post training mean	-4.44	0.88	0.29	-5.12	-3.76	-15.119	8	0.01

Interpretation

The test was set to capture the mean difference (-4.44), the SD (0.88), the standard error of the mean difference (0.29), the lower (-5.12) and upper (-3.76) value at 95% CI, our test statistic or t value (-15.119), the df was 8 and the 2 tailed P value (0.01). Our significance level (alpha) was 0.05.

To determine whether the difference between means was statistically significant, we compared the p-value to the significance level. Our p value of 0.01 was smaller than our alpha (0.05). We looked at the two tailed t- distribution table (see Appendix I for the Values of the Two Tailed T- Distribution) to determine if our t value was greater than the critical value. With 8 df and 95% CI, the critical value was 2.306; our t value (15.119) was much larger than the critical value

We concluded that the difference between pre and post training means was statistically significant.

Discussion

Results of the paired- t test show a statistically significant difference between pre training scores (Mean =1.444, SD =0.881) and post training scores (Mean = 5.888, SD =0.333), t (8) = -15.12, p = 001. This indicates that education interventions contributed to an improvement in clinician's self-rating of their competence and comfort delivering ASBI. However, it is likely that survey results were affected by social desirability bias and a small sample size (N=9). At 95% CI, there is a 5% chance that our test results were in fact the consequence of a Type 1 error. The study was performed on a limited number of participants and only three nursing professionals (one RN, one NP, one NP student) among our population of interest participated in the project. Because our sample size was not big enough, it is difficult to interpret the true impact of the education interventions. In addition, only three nursing professionals participated in the training and these results, despite their statistical significance may not be easily generalized to nursing professionals. One final limitation includes the reality that more than 1/3 of the sample of persons who engaged in ASBI training chose not to complete pre and post evaluations; this type of self-selection bias might influence results interpretation as well.

Healthcare personnel may be equipped with the knowledge and fail to conduct ASBI for many reasons, such as personal bias and beliefs toward alcohol, screening affordability, and patient willingness to engage in screening. ASBI costs range from $0.51 to $601.50 per screen and from $3.41 to $243.01 per brief intervention (Bray, Zarkin, Hinde & Mills, 2012). For many

people, the costs associated with ASBI can be a significant barrier to recovery. For those who seek care, their copayment or even deductible could increase to compensate treatment costs.

The DNP project was designed to target two main objectives: ASBI training and workflow redesign to make ASBI and systematic and routine practice at the project site. However, the pre and post-training questionnaire was only developed around educational interventions. The net gain from workflow redesign adjustment and its effect on staff attitude and comfort toward ASBI remains unknown thus, the need for further investigations.

Beside concerns that may have affected the reliability and validity of the test, the implementation of this project showed a positive relationship between the training and the increase in participant's pre-existing learning levels. The observed standardized effect size (Cohen's d = Mean difference divided by SD difference or d = t divided by square root of N) was large: Cohen's d= 5.04, indicating that the magnitude of the difference between pre and post averages was large enough to be statistically significant. This association was similar and even higher than that reported in referenced studies as evidenced by increased alcohol screening at the project site after routinization.

Conclusion

Health problems associated with alcohol consumption have reached alarming levels, and alcohol use contributes to a wide range of diseases and high-risk behaviors (WHO, 2014). The risk of cancer and other chronic health problems increase with the number of consumed drinks, and even one alcoholic drink a day increases the risk of developing cancers of the breast, mouth, and esophagus (McKnight-Eily, Henley, Green, Odom, & Hungerford, 2017). ASBI is an evidence-based clinical intervention that can help identify and address drinking levels above

normal recommendations. As a USPSTF-recommended clinical preventive service, ASBI is covered by most health insurance plans under the Affordable Care Act without additional cost-sharing by the patient (McKnight-Eily, Henley, Green, Odom, & Hungerford, 2017). Multiple policies and public health efforts have been enacted to increase the provision of ASBI, but this vital intervention continues to be underutilized. According to evidence, adequate knowledge and skills are essential in the successful implementation of alcohol screening and brief intervention protocols (Barclay, Viswanathan, Ratner, Tompkins, & Jonas, 2018). Alcohol screening and brief intervention carry extensive health and societal benefits that outweigh their minor downsides. The successful implementation of this project guided by DOI theory provides evidence that education interventions can be effective at improving competence and comfort in delivering alcohol screening and brief intervention in community healthcare settings.

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Appendix A

Process of Adoption in Roger's Diffusion of Innovation Model
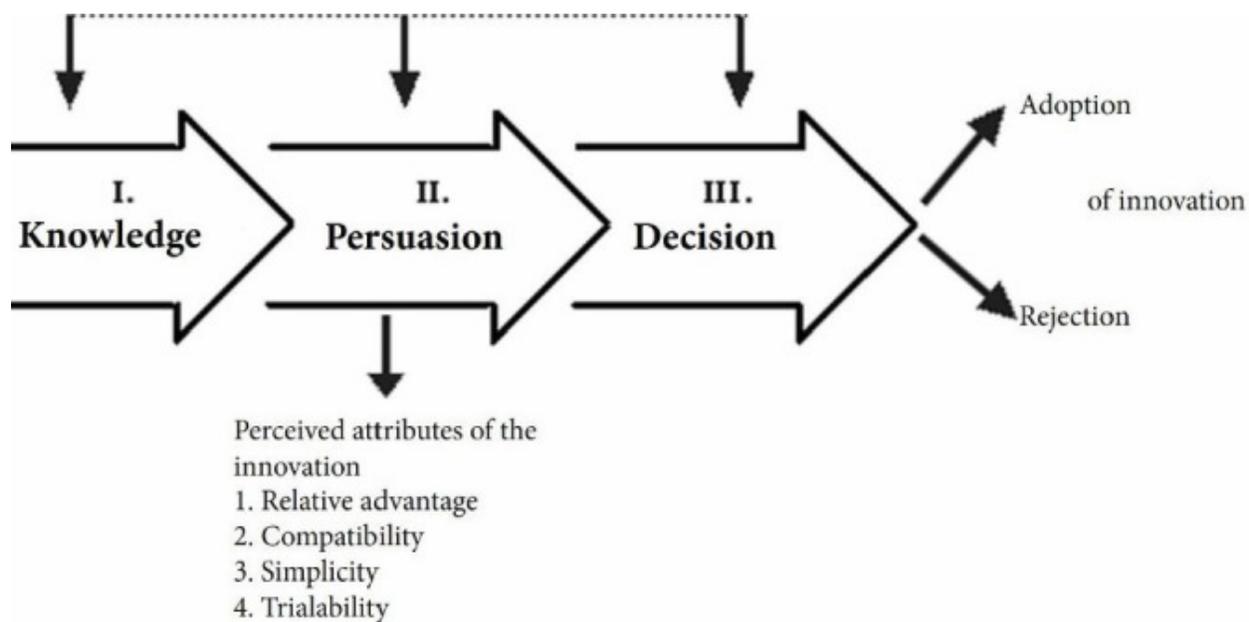
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evidence-based practice using Rogers's diffusion of innovation theory: A model testing

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Appendix B

DOI Adopter Categories
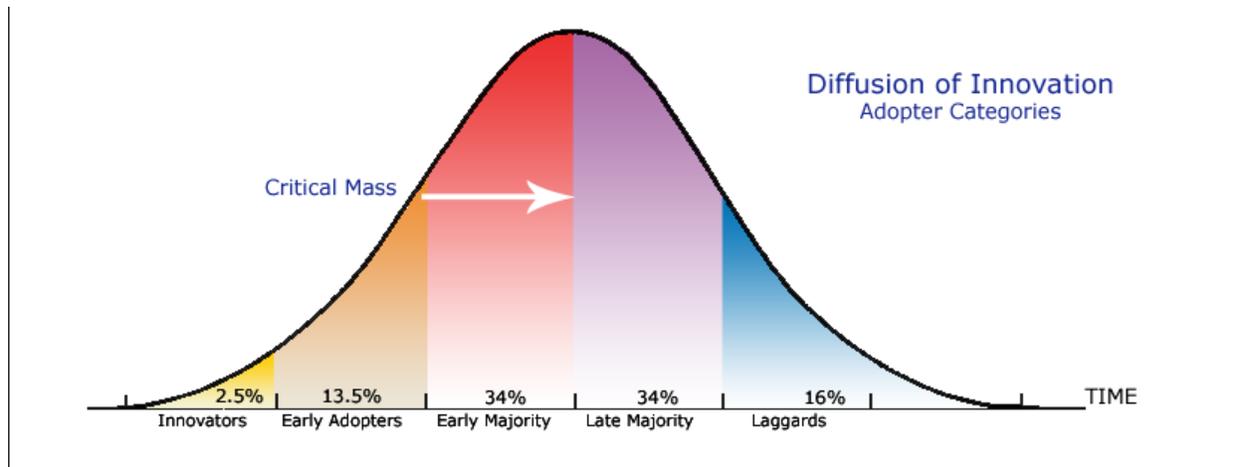
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Appendix C

AUDIT- C Overview

The AUDIT-C is a 3-item alcohol screen that can help identify persons who are hazardous

drinkers or have active alcohol use disorders (including alcohol abuse or dependence).

The AUDIT-C is a modified version of the 10 question AUDIT instrument.

Clinical Utility

The AUDIT-C is a brief alcohol screen that reliably identifies patients who are hazardous drinkers or

have active alcohol use disorders.

 Scoring

The AUDIT-C is scored on a scale of 0-12. Each AUDIT-C question has 5 answer choices. Points

allotted are: a = 0 points, b = 1 point, c = 2 points, d = 3 points, e = 4 points

 In men, a score of 4 or more is considered positive, optimal for identifying hazardous drinking or

active alcohol use disorders.

In women, a score of 3 or more is considered positive (same as above).

However, when the points are all from Question #1 alone (#2 & #3 are zero), it can be assumed that

the patient is drinking below recommended limits and it is suggested that the provider review the

patient's alcohol intake over the past few months to confirm accuracy.

 Generally, the higher the score, the more likely it is that the patient's drinking is affecting his or her

safety.

SAMHSA. (n.d.). *AUDIT-C overview*. Retrieved from

https://www.integration.samhsa.gov/images/res/tool_auditc.pAppendix DAUDIT-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

SAMHSA. (n.d.). *AUDIT-C questionnaire*. Retrieved from

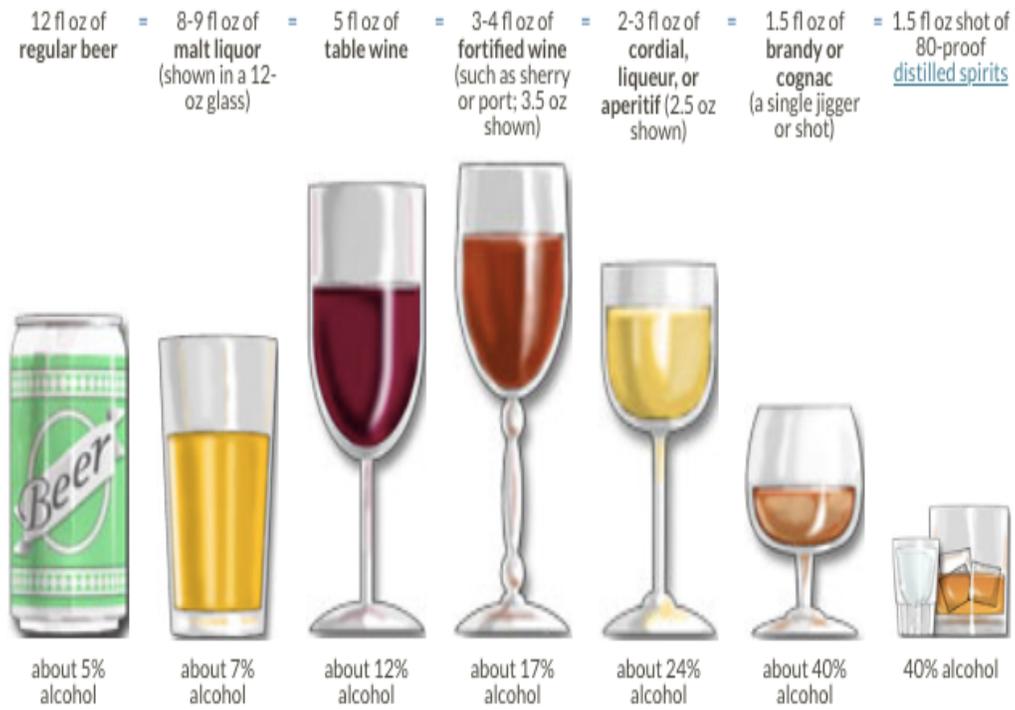https://www.integration.samhsa.gov/images/res/tool_auditc.pdf

Appendix E

SBIRT Process

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Appendix F

US Standard Drink Sizes

| 12 fl oz of regular beer | = | 8-9 fl oz of malt liquor (shown in a 12-oz glass) | = | 5 fl oz of table wine | = | 3-4 fl oz of fortified wine (such as sherry or port; 3.5 oz shown) | = | 2-3 fl oz of cordial, liqueur, or aperitif (2.5 oz shown) | = | 1.5 fl oz of brandy or cognac (a single jigger or shot) | = | 1.5 fl oz shot of 80-proof distilled spirits |

| about 5% alcohol | about 7% alcohol | about 12% alcohol | about 17% alcohol | about 24% alcohol | about 40% alcohol | 40% alcohol |

NIAAA. (n.d.). What's a standard drink?. Retrieved from

https://www.rethinkingdrinking.niaaa.nih.gov/How-much-is-too-much/what-counts-as-a-

drink/Whats-A-Standard-Drink.aspx

Appendix G

Approval Letter by the University of Massachusetts Amherst IRB

UMassAmherst

Human Research Protection Office

Mass Venture Center
100 Venture Way, Suite 116
Hadley, MA 01035
Telephone: 413-545-3428

Memorandum – Not Human Subjects Research Determination

Date: September 17, 2019

To: Abdonne Mbouadeu, Nursing

Project Title: Improving Alcohol Screening and Brief Intervention in Community Health Settings: Training and Evaluation

IRB Determination Number: 19-146

The Human Research Protection Office (HRPO) has evaluated the above named project and has made the following determination based on the information provided to our office:

☐ The proposed project does not involve research that obtains information about living individuals [45 CFR 46.102(f)].

☐ The proposed project does not involve intervention or interaction with individuals OR does not use identifiable private information [45 CFR 46.102(f)(1), (2)].

☒ The proposed project does not meet the definition of human subject research under federal regulations [45 CFR 46.102(d)].

Submission of an Application to UMass Amherst IRB is not required.

Note: This determination applies only to the activities described in the submission. If there are changes to the activities described in this submission, please submit a new determination form to the HRPO prior to initiating any changes.

A project determined as "Not Human Subjects Research," must still be conducted in accordance with the ethical principles outlined in the Belmont Report: respect for persons, beneficence, and justice. Researchers must also comply with all applicable federal, state and local regulations as well as UMass Amherst Policies and procedures which may include obtaining approval of your activities from other institutions or entities.

Please do not hesitate to call us at 413-545-3428 or email humansubjects@ora.umass.edu if you have any questions.

Iris L. Jenkins

Iris L. Jenkins, Assistant Director
Human Research Protection Office

Appendix H

Pre and Post Survey Questionnaire

Numeric Rating Questionnaire

1= (low) not adequate

2= not really adequate, but almost OK

3= adequate

4= medium (somewhere between OK and high)

5= high

6= excellent

How would you rate?

1. Your overall knowledge of systematic alcohol screening and brief intervention

1 2 3 4 5 6

2. Your motivation and attitude toward alcohol screening and brief intervention

1 2 3 4 5 6

3. Your comfort and confidence when discussing alcohol related issues and behavior change
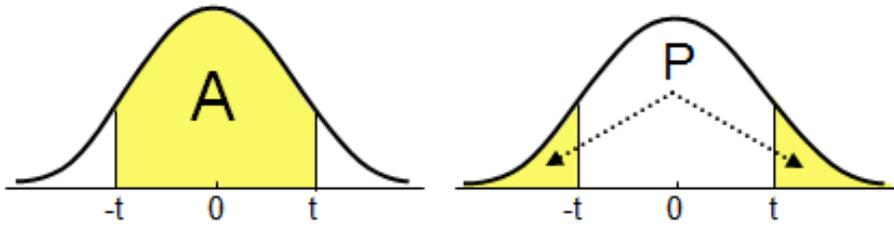
1 2 3 4 5 6

4. Your ability/willingness /desire/intent to mentor colleagues on alcohol screening and brief

intervention process

1 2 3 4 5 6

Appendix I

Values of the Two Tailed T- Distribution

DF	A	0.80	0.90	0.95	0.98	0.99	0.995	0.998	0.999
	P	0.20	0.10	0.05	0.02	0.01	0.005	0.002	0.001
1		3.078	6.314	12.706	31.820	63.657	127.321	318.309	636.619
2		1.886	2.920	4.303	6.965	9.925	14.089	22.327	31.599
3		1.638	2.353	3.182	4.541	5.841	7.453	10.215	12.924
4		1.533	2.132	2.776	3.747	4.604	5.598	7.173	8.610
5		1.476	2.015	2.571	3.365	4.032	4.773	5.893	6.869
6		1.440	1.943	2.447	3.143	3.707	4.317	5.208	5.959
7		1.415	1.895	2.365	2.998	3.499	4.029	4.785	5.408
8		1.397	1.860	2.306	2.897	3.355	3.833	4.501	5.041
9		1.383	1.833	2.262	2.821	3.250	3.690	4.297	4.781
10		1.372	1.812	2.228	2.764	3.169	3.581	4.144	4.587
11		1.363	1.796	2.201	2.718	3.106	3.497	4.025	4.437
12		1.356	1.782	2.179	2.681	3.055	3.428	3.930	4.318
13		1.350	1.771	2.160	2.650	3.012	3.372	3.852	4.221
14		1.345	1.761	2.145	2.625	2.977	3.326	3.787	4.140
15		1.341	1.753	2.131	2.602	2.947	3.286	3.733	4.073
16		1.337	1.746	2.120	2.584	2.921	3.252	3.686	4.015
17		1.333	1.740	2.110	2.567	2.898	3.222	3.646	3.965
18		1.330	1.734	2.101	2.552	2.878	3.197	3.610	3.922
19		1.328	1.729	2.093	2.539	2.861	3.174	3.579	3.883
20		1.325	1.725	2.086	2.528	2.845	3.153	3.552	3.850

Schoonjans, F. (2019, March 19). Values of the t-distribution (two-tailed). Retrieved from

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