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Screening for Alcohol Use, Misuse, or Abuse in the Primary Care Setting using the AUDIT-C tool: An Extension Study

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Courtney Amanda Minnis, Student

Dr. Julie Ossege, Advisor

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Submitted in Partial Fulfillment of the Requirements for the Degree of Doctor of Nursing Practice at the University of Kentucky

By

Courtney A. Minnis

Louisville, KY

2019

Dedication

This DNP project is dedicated to several people who have helped me along this journey, without them none of this would have been possible. To my soon to be husband Gage, we began our relationship when I had just found out I had been accepted into this program and was going to be putting our relationship to the ultimate test when it had just begun. You have been my constant cheerleader, motivator, and supporter. You always had faith in me even at times when I didn't have faith in myself. You will never know how truly grateful I am for all the sacrifices you have made and to have you stand by me through all of this, I could have not done this without you. I love you so much. To my sister Susan, you have supported me through this program by always being a shoulder to lean on, humor to laugh at, and snack supplier when the thought of grocery shopping seemed too big of a task. Thank you for also being there when life through more at me than this program and being my strength whenever I needed you. I hope you know how much you mean to me. To my best friend and rooms Stephanie, we have been through so much together and have always been there when I needed you. I love you. To Nicole and Kelli and the rest of my FNP and Cohort 4 family, you all are the only people who truly understand every emotion, assignment, fear, and every hurdle and success we have endured to get to this point. I love you all and am a better person today from knowing each and every one of you. To my sweet Lucy girl, thank you for every hug, cuddle, and doodle drop that made me smile and make the scary things not so bad. Life wouldn't be the same without you. Finally, to my sweet guardian angel Laurie, you were the first person to know I got my interview to this program, and I have no doubt you have been cheering me along in heaven. I hope I have made you proud, I love you.

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Abstract

PURPOSE: The purpose of this study was to improve alcohol screening rates in one primary care setting by educating and supporting providers and office staff on the use of the Audit-C alcohol screening tool.

METHODS: This study design was a Quasi-Experimental intervention, one group post-test. Data was collected utilizing a retrospective chart review from the electronic medical records of adults over age 18 years by visit type: New Patient Visit, Annual Visit, or Employee Wellness Exam. Data included: demographic data of patient age, race, gender, the Audit-C score, and whether or not an intervention was performed.

RESULTS: Five providers (three APRN and two MDs) consented to participate. Of the 100 patient charts reviewed, 33 had an AUDIT-C score documented by a provider. The Audit-C scores ranged from 0-5. Fifty-six percent of females and 20% of males scored high enough for a brief intervention. Three intervention types were found (Counseling, patient declines/no intervention results not documented) with the most common type being counseling.

CONCLUSION: The use of the Audit-C in a primary care setting was shown. Office Staff and providers successfully demonstrated the ability to complete the Audit-C tool and indicated interventions within standard appointment times. Further studies to examine the impact of adding the Audit-C to an EMR and its impact on screening rates is warranted.

Screening for Alcohol Use, Misuse, or Abuse in the Primary Care Setting using the AUDIT-C tool: An Extension Study

Introduction

Alcoholism is a major health concern in the United States [US]. Alcoholism leads to numerous health disparities such hypertension, heart and liver diseases, cancers, and poor health outcomes due to higher incidences of risky behaviors (CDC, 2015). Annually, alcoholism costs the US over two-hundred and fifty billion dollars (CDC, 2016). Further broken down, alcoholism annually costs the US healthcare industry about 30 billion dollars, workplace productivity $179 billion, $13 billion in car collisions, and $25 billion in the criminal justice system (CDC, 2016). The area of medicine that is able to make the largest impact on decreasing alcoholism and the detrimental effects it causes is primary care (Fleming, 2005). According to the CDC approximately 54% of ambulatory care visits were made to a primary care setting (CDC, 2016). This large number of visits represents an opportunity for outreach and screening in primary care. Therefore, strategies to aid providers ability to combat alcoholism in primary care must be implemented.

Background

The burden of alcohol misuse extends beyond the U.S. In 2012, almost six percent of all deaths worldwide were attributed to alcohol consumption (WHO, 2014). Worldwide, the World Health Organization [WHO] (2014) estimates more than 200 diseases and injury-attributed conditions were attributed to alcohol misuse.

According to the National Institute on Alcohol Abuse and Alcoholism (NIAAA) most recent report, over 15 million adults in the United States consume enough alcohol to be diagnosed as having an alcohol use disorder (2015). In the U.S., heavy alcohol use is accountable for close to one-hundred thousand deaths each year (CDC, 2015). The National Institute on Alcohol Abuse and Alcoholism defines heavy alcohol use as binge drinking on five or more days in the past month. Binge drinking is defined as a pattern of drinking that brings blood alcohol concentration levels to 0.08 g/dL., typically occurring after four drinks for women and five drinks for men within about two hours (U.S. Department of Health and Human Services and U.S. Department of Agriculture, 2015). The largest age group that is affected by excessive drinking are those aged 25-35 years, followed by those 18-24 and in third those aged 35-44 (CDC, 2015). These ages are among those seen by primary care. The overuse of alcohol can affect not just those directly consuming it but their families and communities as well. Conditions that can occur due to excessive drinking are hypertension, cancers, various heart and liver diseases, and stroke (CDC, 2015). Excessive alcohol use can also attribute to sexually risky behaviors such as unplanned pregnancies, and sexually transmitted diseases (CDC, 2015). Alcohol abuse can also lead to vehicular crashes, violence, injuries, and fetal alcohol disorders (CDC, 2015). Primary care practitioners can help patients avoid these health problems or risks with early recognition of alcohol abuse (Fleming, 2005).

Alcoholism is defined by the Substance Abuse and Mental Health Services Administration (SAMHSA) as the heavy consumption of alcohol for more than five days in a one-month period (Substance Abuse and Mental Health Services Administration (SAMHSA), 2015). SAMHSA's most recent survey found that more than half of Americans older than twelve years of age drink alcohol and close to thirty percent of those Americans identified themselves as binge or heavy drinkers (SAMHSA, 2015). Americans who exhibit dangerous drinking

behaviors are more likely to experience cardiovascular, liver, and neurologic diseases as well as increased risk of certain cancers and decreased safety awareness leading to sexually transmitted diseases and motor vehicle accidents (CDC, 2015). Almost one-hundred thousand Americans die annually from alcohol-related deaths, making alcohol the third leading preventable cause of death in the United States (National Institute on Alcohol Abuse and Alcoholism, 2017). These deaths are attributed to alcoholism causing a multi-system cellular insult to organs. Specific life-threatening outcomes attributed to alcoholism include: breast and colon cancer, pancreatic disease, liver cirrhosis, diabetes, osteoporosis, arthritis, kidney disease, immune system disjunction, hypertension, coronary artery disease, cardiomyopathy, and central nervous system disorders (Dguzeh, et. al., 2018). Clearly, processes to identify alcohol use and misuse as early as possible are needed to avoid detrimental morbidities.

Screening and acute interventions can help curb the severity of alcohol use by catching and addressing the problem early. Primary care has the ability to make a dramatic impact on alcohol abuse through proper screening. Primary care is the recommended population for prevention (Moyer, 2013). Primary care providers can reduce the stigma of discussing alcohol consumption as these providers generally have a long-standing relationship with patients. Patients have been found to agree that provider knowledge of a patient's substance abuse is important because of its impacts on health and medical care and that substance use is not properly identified in medical settings currently (McNeely et. al., 2018). Therefore, Universal screening is the best approach.

The United States Preventative Services Tasks Force [USPSTF] is an evidence-based Resource that supports screening for alcohol misuse as evidenced by their published clinical guideline regarding alcohol misuse (2004). The USPSTF (2019) recommends alcohol screening at a grade B level. A grade B indicates that the suggestion for practice should be to offer or

provide this service. The USPSTF recommends the service with a high certainty that the net benefit is moderate or there is moderate certainty that the benefit could be substantial. Specifically, "The USPSTF recommends screening for unhealthy alcohol use in primary care settings 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" (U.S. Preventative States Task Force, 2019). USPSTF recommendations are a cornerstone of practicing providers which guides their practice through recommendations and practice standards. This recommendation from the USPSTF should be the evidence-based guideline that could drive protocol creation to standardize alcohol screening.

The USPSTF recommends an evidenced based intervention of annual screening with a standardized screening tool such as the Alcohol Use Disorders Identification Test- Consumption (Audit-C) followed with brief intervention or counseling as needed (Moyer, 2013). Alcohol screening is a prerequisite for alcohol counseling and intervention for primary care patients, which can decrease drinking and associated risks (Fleming, 2005). Primary Care Providers can utilize screening tools such as the Audit-C to quickly identify heavy drinkers or those who are at risk of becoming heavy drinkers, thus impacting the current future health of their patients.

The Audit-C tool is favorable to providers due to its detection sensitivity for alcohol consumption (Tam, Zwar, and Markham, 2013). Educating primary care providers and MA's will be necessary to ensure this screening is understood and correctly administered to patients. Studies that provide in person training experienced improved provider confidence in the tool, ability to administer it, and improved screening rates (Strayer et. al., 2012). Encouraging providers and their office staff to meet an achievable goal of administering this quick screening tool with minimal interruptions to their schedules will create an achievable benchmark.

Achievable benchmark usage enhances the effectiveness of provider performance of a quality improvement intervention significantly (Kiefe, C., Allison, J., Williams, D. (2001).

Implementing the Audit-C tool and educating office staff on how to properly use the tool is important in primary care. Earlier identification of heavy drinking can lead to earlier intervention and subsequently decreased rates of comorbidities or risks. Unhealthy drinking choices and consequences can be reduced through screening and counseling in primary care (Moyer, 2013). Implementing the three question Audit-C tool can be easily performed, scored and addressed by providers while having a minimal impact on time constraints in a primary care appointment. By implementing the Audit-C tool, it is expected that with increased frequency of alcohol screening, a less advanced course of alcoholism will be identified earlier and therefore a reduction of comorbidities and healthcare costs will be seen.

Discussing alcohol use, abuse, or misuse, can be a difficult topic for both patients and providers to discuss. Screening, Brief Intervention, and Referral to Treatment [SBIRT] can be utilized by providers as a tool for opening the door for discussion and early interventions. SBIRT is an evidence-based practice used to identify, reduce, and prevent problematic use, abuse, and dependence on alcohol and additionally, illicit drugs (Center for Medicare and Medicaid Services (CMS), 2019). SBIRT begins with screening, such as the Audit-C, and if indicated transitions to a brief interventions and referral to treatment. Brief interventions consist of counseling or education using motivation interviewing, mutual plan building, and referral (American Public Health Association and Education Development Center, Inc., 2008)

Prior to this study, the study organization's primary care settings were not using a standardized alcohol screening tool. Five assessment questions were asked: do you drink alcohol yes or no? Per week: what are the number of glasses of wine, number of cans of beer, number of shots of liquor, number of standard drinks or equivalent that you consume? Also, there was an

area for free text in that section that appeared to be the most frequently used. These questions are similar but not the same as the Audit-C questions. These questions are more vague and are not scored so knowing when to intervene is left to the provider.

Alcohol use and abuse is a growing epidemic that has been on the rise in recent years. There are opportunities for primary care providers to make a consistent effort and impact that is currently being missed. Continuing the effort to combat this epidemic, this study is an extension of a previously completed project within the same healthcare system in a different primary care setting two years prior to the completion of this study.

Purpose

The purpose is to improve rates of alcohol screening in one primary care setting to prevent complications from alcohol misuse or abuse. The primary objectives are to:

1) Educate providers and office staff on the Audit-C screening tool in primary care.

2) Implement the Audit-C alcohol screening tool in one primary care setting.

3) Assess frequency of documentation of alcohol screening/counseling after the implementation of the Audit- C tool.

This project is relevant to the study specific healthcare system because it supports the system's aim to be a proactive and caring healthcare provider that makes positive impacts to the community it directly serves. Improving healthcare providers and MA's ability to appropriately perform the Audit-C screen may aid them in becoming more holistic providers and positively influence their comfort level when discussing and intervening with patients suffering from alcohol addiction.

Utilizing Lewin's Change Theory to Guide Study

Lewin's Change Theory represents a practical model for understanding the process of change. Lewin states change can be enacted in one of two ways: by reducing the strength of opposing forces or by increasing the force for change in the desired outcomes. Lewin's model addresses these forces and states for change implementation force strength must be increased while the strength and position of change forces must be removed or reduced for change implementation.

Lewin's Change theory has three phases. The first phase, unfreezing, is where the problem or process needing change is addressed and people are made aware of the need for change. In the second phase, moving or change, actual implementation of the change occurs. In the third phase, refreezing, the implementation of the change is monitored, and adjustments are made as necessary (Lewin, 1951).

Lewin's Change Theory was selected to guide this study because it provided a strong framework in which this study followed. The unfreezing phase for this project guided research focused on the rising problem of alcohol abuse and focusing on the need for change in primary care to combat the issue. The goal of the unfreezing phase is to create awareness of how the current practice is no longer acceptable. The examination of old and current behaviors of people processes, policies, and structure are examined during this stage. During the project the PI examined the current alcohol screening practices in place and noted an area for potential change (Lewin, 1951). The Audit-C was found to be the recommended evidence-based screening practice recommended in primary care.

The moving phase of the study centered around the education and study briefing for providers and office staff. Borkowski (2016) states to ease the struggle of change for participants, to educate them on reasons for change and feel active in the design of new methods.

Providers and office staff received a briefing that included current statistics indicating need for change regarding alcohol use and why primary care was needed and able to make an impact. Further, the Audit-C materials and SBIRT materials were provided so that participants could more easily become accustomed to change. This phase is also where participants put the change in place by screening patients and then documenting results and interventions as necessary.

The refreezing phase of the project was supported by the PI being in the office on multiple occasions during the study period to monitor implementation of change and make adjustments as necessary through speaking with participants. Continuous monitoring ensures successful operation of the change while supporting feedback from participant audits and observed findings (Borkowski, 2016).

Methods

Design

This study was a Quasi-Experimental intervention, one group post-test. Data was collected via retrospective chart reviews from the electronic medical records.

Setting

The study was performed at a single primary care office within a large provider network that serves the Louisville Metropolitan area and consists of numerous community medical offices, urgent care centers, well-clinics, specialists, and five major hospitals. Three advanced registered nurse practitioners and two physicians consented to be a part of this study.

Sample

The study included 100 adult patients being seen for Employee Wellness, New Patient, and Annual Well Patient exams during the working days of a two-month time period between June 1, 2019 and July 31, 2019. These visit types were selected due to the elongated visit time

and these are the types of visits where screenings were already being performed. Patients were excluded if they were less than eighteen years of age or could not read or understand the English language. Patients were also excluded if they were being seen for an acute or episodic illness type visit.

Measures

The Audit-C tool is a valid screen for at-risk drinking for those who utilize primary care (Campbell and Maistro, 2018). The Audit- C screening tool is a brief three item questionnaire utilized for alcohol misuse identification (Bradley et. al., 2007). The three questions included on the questionnaire are: How often do you have a drink containing alcohol? How many drinks containing alcohol do you have on a typical day when you are drinking? How often do you have six or more drinks on one occasion (Bradley, et. al., 2007)? Each question has 4-5 possible answer options that are assigned a point score. The possible point total ranges from 0-12 points. A score greater than four for men and greater than three for women indicate potential alcohol misuse (Bradley et. al., 2007).

The Audit-C tool is an abbreviated version of the Audit tool and will fit into the confines of a primary care appointment more easily than its elongated parent tool and takes about one to two minutes to complete (Moyer, 2013). The Audit C screening tool has been shown to be as effective and even outperformed the full audit tool for identifying heavy drinking. The Audit-C was also psychometrically superior to the full AUDIT and CAGE tools (Rumpf et. al., 2002; Bradley et. al., 2007; Meneses-Gaya et. al., 2010). In a previous Audit-C study that aimed to examine the psychometric properties of the Audit-C, the screen demonstrated good reliability (0.91) and satisfactory convergent validity. The areas under the ROC curves for any alcohol use disorder and alcohol dependence of the Audit-C were 0.87 and 0.93. (Jeong et. al., 2017).

Procedures

The PI went to a monthly scheduled office meeting and explained the study purpose and aims to the office staff as well as their role in the Audit-C process. The PI also educated the office staff which patients were eligible to participate in the study and how to score the Audit-C. Provider preference determined whether the office staff member would then give the completed Audit-C screen directly to the provider or leave it in the exam room for the provider to review.

The same information was individually delivered to providers who were unable to attend the meeting. Additionally, providers were also each given educational material on the Audit-C tool, alcohol-related resource materials such as community resources and intervention aids. Providers were then left to decide if they were willing to participate in solitude and those who consented left their signed consent forms in a private office for the researcher to collect. The PI returned on different day to collect signed consent forms. The office manager notified the office staff which providers were participating in the study.

The procedure for using the Audit-C in this office was as follows: The screen was printed on a sheet of paper with corresponding scoring directions printed on the back. Audit- C questions were asked and scored during the rooming process by office staff. The questions were either read to the patient by the office staff member or the patient selected their answers themselves. This decision was left to the individual staff member to select which worked best for their appointment work-flow. The provider would then document the score in their visit narrative. The provider also documented an intervention if that was performed.

The materials that were utilized in this study were duplicated from a study done two years prior by a previous student. One exception to this was the community resources form in which options were updated to reflect current locations and operating hours.

This procedure took place for two-months. This study was approved by the University of Kentucky IRB and the healthcare system in which the study was performed.

Data Collection

Data was collected from patient charts and provider notes during a retrospective chart review. Chart numbers were provided by the healthcare data analytics office based on inclusion and exclusion criteria, specific providers, and within the study time-frame. A temporary crosswalk table was created and kept during the study with the patient's medical record number matched to a unique study identification number to protect privacy and prevent duplication. Data collection was performed by accessing the provider note from the specific patient encounter. Data collected from each patient electronic medical record included: patient study identification number (1-100), age, gender, and race. Additional information collected included the Audit-C score charted in the provider visit note, the specific Audit-C score (0,1, 2, 2, 4, 5, etc.), whether an intervention was performed (yes or no), and if so what type of intervention was performed (counseling, referral, no intervention, patient declines intervention, and results not documented). This data was collected in an electronic spreadsheet. The temporary crosswalk was subsequently then destroyed. Tables 1 and 2.

The PI was also present in the office during the study period to answer questions and provide guidance to office staff and providers as needed. The PI asked staff and providers their thoughts about the process, any problems they were encountering, and suggestions for future use of the Audit- C tool. Hand written notes were documented by the PI after these encounters.

Data Analysis

Descriptive statistics including standard deviation (SD), frequency distributions, means, and percentages were applied to describe the sample and demographics. Statistical guidance was provided by a statistician from the University of Kentucky College of Nursing.

Results

One hundred charts were reviewed. The sample included 53% females, 84% Caucasians, 9% African American, and 7 % other ethnicities. The age ranges of the patients were 19-78 years with a mean age of 41 and SD of 13.9. See Table 1.

During the study 33% of Audit-C scores were documented in the provider visit note. Three additional scores were calculated from the Audit-C questions that were loaded into that EMR during the study and not from the paper Audit-C forms. The score was not documented in the provider note. However, the PI calculated the score when all three questions were answered in the EMR.

As previously stated, the Audit-C total score can range from 0-12. Men who score above 4 and women who score above 3 are considered to have a positive score. A positive score indicates potentially hazardous drinking behaviors and warrant an intervention. Audit-C scores ranged from 0 to 5 in this sample. There were no scores of 6 and above meaning no patients showed in the risky range. The most common score (n=9) that was documented was a three. For women, a score of 3 indicates potentially hazardous drinking behavior. Table 2 shows a complete breakdown of the specific scores for the group and by gender.

Four males and eight females scored high enough to warrant an intervention. EMR documentation revealed the interventions included: counseling, patient declines, and intervention results not documented if their score warranted it. Out of the four males who scored high enough to warrant an intervention, two received counseling, one declined an intervention, and one had

no intervention documented. Out of the eight women who scored high enough to warrant a brief intervention: five received counseling, two declined intervention, and one had no intervention result documented.

During discussions with the PI, various office staff members and providers stated that the screening was going well, and they did not have any questions or concerns. One staff member stated that they believed the screening was easy to perform. One provider stated that they enjoyed using the tool and enjoyed having the score it generated.

Discussion

The goal of this study was to educate providers on the importance of alcohol screening and empower them to intervene if necessary. The study had a goal of assessing the practicality of using this tool in a primary care practice. This was accomplished through evaluating the frequency with which the Audit-C score was documented as well as any indicated intervention.

Alcohol screening should be a standard of care in the primary care setting. Primary Care Providers have the opportunity to screen for and subsequently identify risky behaviors such as potentially hazardous drinking behaviors before it becomes an addiction or a disease state with serious and potentially deadly consequences

Provider Adherence

The study results showed Audit-C use in primary care is practical. This is similar to a previous study which showed 92% of provider adherence during a shorter study duration (Spear, 2017). Given that two studies have showed the Audit-C is both useful in a primary care setting tells us that it is practical for primary care to utilize this tool on a broad-spectrum and impact the frequency and severity of alcohol misuse and morbidities that alcoholism causes.
however more data is needed.

A study focusing on alcohol use disorders and primary health care focused on barriers that providers may find a struggle to screen and intervene for alcohol use disorders. Among major barriers for providers are lack of education and financial incentives, fear of losing patients, time constraints and role definition (Rehm, et. al., 2016). It may be beneficial to research the effects these barriers have on screening rates and methods that can be utilized to improve this and subsequently increase screening rates.

The rate of audit-C use in this study was much lower than in the original study done within this organization. This could be due to the previous study having a shorter study period that allowed more short-term focus on completing the study. The previous study also had fewer participating providers which could've granted the PI more time and access to providers to promote study procedure adherence.

One provider stated that they appreciated the objective score that the Audit-C generated. This screening tool provides objective data. Screening tools ideally identify patients early enough to provide treatment and avoid or reduce symptoms or other consequences (Iragorri and Spackman, 2018). The firm score generated by the Audit-C takes the guess work out of subjective data and enlightens providers to potential problems more efficiently and accurately. Objective data is quantitative, allowing providers to use tight abstract definition of numbers to control parameters of how ideas can be conveyed and evaluated. Objectivity allows providers to utilize data that is free from personal biases or emotional involvement (Heidar, 2015).

Providers did not indicate to the primary investigator why Audit-C scores were not documented. If a QI project study was implemented to focus on the process of adding in an alcohol screening perhaps the reasons for not using and/or not documenting the screening could be exposed and immediately rectified.

Limitations

Various limitations were identified in the design and implementation of this study. The alcohol screen was limited to new patient, annual physical, and employee wellness visits. This limits the number of patients that would be available for this screen as providers see episodic, sick, or lab visits throughout their day as well. All five providers were open to seeing new patients, but this number could be limited based on the number of new patients visits they see per day.

Another limitation to this study could be that providers had limited time for education and follow-up during the study period. It is recommended that should the Audit-C become a standard of practice permanently, there be dedicated time for education on using the tool and management of risky drinking behaviors.

A further limitation to this study is consistency of staff working with providers. The Audit-C screenings were initiated in the rooming process with the MAs and if this was not done the provider did not have this vital health information to review and act upon. Initiating an office wide culture of performing alcohol screenings would benefit a large office such as this and alleviate missed screenings.

The PI's lack of access to providers could have also been a limitation. The PI was there on study days one, 30, and 60 to answer any questions the office staff or providers may have had. The PI had various access to providers as they may not have been there on the same day as the PI. While every provider and office staff member had access to the PI's direct contact information, this was not utilized. Although these providers and office staff did not have any questions, they or future providers and staff likely will if the Audit-C screen becomes a standard of practice.

A final limitation occurred when the Audit-C screen was added into the EMR after the study started. Specifically, the three Audit-C questions were added to the EMR health maintenance screen. While the screening tool was loaded in the EMR, answering the questions did not generate a score. Nevertheless, this was a limitation to the study as MAs and providers could have been confused with which set of questions to use for screening. The PI was not aware these questions were added to the EMR until the retrospective chart review which did not allow for any discussion with the providers and staff about how to handle this change.

Implications and Recommendations

Recommendations for moving forward with future research studies include implementing this project on a larger scale with more providers. This would allow for process difficulties to be addressed on a larger scale. Future studies are crucial for the future of screening for alcohol use and misuse. Future studies could focus on those systems that have added the Audit-C screening tool into their EMRs and study the impact that resource could have on screening rates.

There is also room for improvement in educating providers and office staff on the importance of alcohol screening and motivational interviewing. Knowledge is power. Motivating providers and staff to do perform alcohol screening relies on competency in both and skill. Providers and staff also need to be on the same page when it comes to screening. It was found through this study that almost every provider and staff member assesses or documents alcohol screening in a different way. A recommendation from this study is to introduce a protocol which encourages all providers to screen and document alcohol screenings in the same way which reduces margin for error. Evidence-based protocols drive quality improvement (Finnegan, 2014).

Once providers can be shown better outcomes for patients through consensus-based practice, more buy-in from healthcare professionals will be achieved. Healthcare organizations can choose areas, such as screening for alcohol use in primary care, where they will have the

highest probability of success (Finnegan, 2014). With Kentucky near the top of the list for alcohol misuse there is potential for large impact on primary care patient health outcomes.

This study's predecessor, performed two years prior, found that in discussion with providers following the study that they recommended the Audit-C screen should be added to the EMR. That recommendation is now a reality in this particular office that this study was performed in. A subsequent recommendation based on this is that the office has an educational session both with providers and medical assistants to educate on this tool, how to complete it entirely and correctly, and how to interpret the results. Additionally, it is a recommendation from a provider in this study that the Audit-C score be automatically generated when the questions are answered in the EMR and a pop-up or side information bar reveals what the score means. This would streamline the process and not slow down the visit to score results and then interpret scores.

Conclusion

The purpose of this study was to expand on a previous study in the same healthcare system examining the practicality of alcohol screening using the Audit-C tool in primary care system. This study expanded upon the length of time the study was performed as well as the number of participating providers. These results show that screening for alcohol in primary care is practical. More studies need to be performed with expanded education for providers and staff to facilitate completion of the screening tool and documentation of the result. Additionally, future research on the impact of the Audit-C loaded into the EMR is needed. Alcohol screening in primary care is the front-line on the battle of alcohol abuse and misuse which is an issue that is continuing to rise in the state of Kentucky and the United States. Effective use of this screening tool alone could make a large impact on this negative health outcome and save countless lives from this epidemic.

Table 1. Demographic and visit characteristics of the sample (*N* = 100)

	Mean	(SD)
Age	40.8	(13.904)
	N (%)	
Gender		
Male	47 (47%)	
Female	53 (53%)	
Race		
Black	9 (9%)	
Caucasian	84 (84%)	
Other	7 (7%)	
Documented Audit C in notes		
Yes	33 (33.0%)	
No	67 (67.0%)	

Table 2. Audit-C score distributions by gender:

Audit-C Score by Gender		
	Male (n=16)	Female (n=20)
Score		
0	2 (12.5%)	3 (15.0%)
1	3 (18.8%)	4 (20.0%)
2	3 (12.5%)	5 (25.0%)
3	5 (31.3%)	4 (20.0 %)
4	1 (6.3%)	2 (10.0%)
5	3 (18.8%)	2 (10.0 %)

** *The tool was used, and score documented in notes 33 times, but there were an additional three who had a score calculated from electronic scoring.*

Table 3. Intervention Outcomes Among men who scored high (n=4)

Interventions for Men Who Scored high	
Counseling	2 (50%)
Patient Declines/No Intervention	1 (25%)
Results Not Documented	1 (25%)

Table 4. Intervention Outcomes Among men who scored high (n=8)

Interventions for Women Who Scored high	
Counseling	5 (62.5%)
Patient Declines/No Intervention	2 (25%)
Results Not Documented	1 (12.5%)

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