Published in final edited form as:

Alcohol. 2018 September ; 71: 65–73. doi:10.1016/j.alcohol.2018.01.003.

Perceived barriers by healthcare providers for screening and management of excessive alcohol use in an Emergency Department of a low-income country

Catherine A. Staton, MD MSc^{a,b}, Joao Ricardo Nickenig Vissoci, PhD^{a,b}, Rachel Wojcik^c, Jon Mark Hirshon, MD PhD^d, Mark Mvungi, MD^e, Blandina T. Mmbaga, MD, PhD^{e,f}, and Monica Swahn, PhD^g

^aDuke Emergency Medicine, Duke University Medical Center, Durham, North Carolina, USA

^bDuke Global Health Institute, Duke University, Durham, North Carolina, USA

^cUniversity of Colorado School of Medicine, Denver, Colorado, USA

^dDepartment of Emergency Medicine, University of Maryland School of Medicine, Baltimore, MD, USA

^eKilimanjaro Christian Medical Center, Moshi, Tanzania

^fKilimanjaro Clinical Research Institute, Moshi, Tanzania

^gSchool of Public Health, Georgia State University, Atlanta, Georgia USA

Abstract

Annually, alcohol causes 3.3 million deaths; countless more alcohol-related injury patients are treated in Emergency Departments (ED) worldwide. Studies show that alcohol related injury patients reduce their at-risk alcohol use behavior with a brief-negotiation interview (BNI) in the ED. This project aims to identify potential perceived barriers to implementing a BNI in Tanzania. A knowledge, attitude, and practice questionnaire was piloted and administered to all Emergency Department healthcare practitioners, including physicians, advanced medical officers and nurses. The questionnaire included the Perceived Alcohol Stigma (PAS) Scale. The survey was self-administered in English, the language of healthcare instruction, with a Swahili translation available if preferred. Data were analyzed with relative and absolute frequencies and Spearman's correlation. 34 (100%) healthcare practitioners completed the survey. Our results found positive attitudes towards addressing alcohol misuse (88%), but very poor knowledge of recommended alcohol use limits (24%). Participants were willing to discuss alcohol use (88%) and screen (71%) for alcohol use disorders. Most healthcare practitioners report significant stigma against those with

Corresponding Author: Catherine A. Staton, MD, MSc, Duke University Medical Center Box 3096, 2301 Erwin Road, Durham, NC 27701, Catherine.staton@duke.edu, Office: 919-681-0196, FAX: 919-681-8521.

Conflicts of Interest: All authors have no conflicts of interest to report.

Publisher's Disclaimer: This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final citable form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

This project was presented at the Kettle Brun Society in Sheffield, UK on June 5-9th.

alcohol use disorders; (39% discrimination, 53% devaluation, 71% either). Counseling patients about high risk alcohol use was directly and positively associated with at-risk alcohol and counseling education and believing it was common to ask patients about tobacco and alcohol use; it was negatively associated with believing it was ‘not my role’ or that knowing alcohol use ‘won’t make a difference’. Stigma was negatively and indirectly associated with counseling patients. In conclusion, in an ED in Tanzania, healthcare practitioners have positive attitudes towards addressing at-risk alcohol use and endorsed having training in alcohol misuse in school. Unfortunately, participants did not demonstrate knowledge of recommended alcohol limit guidelines. Similarly, amongst practitioners, there is a significant discrimination and devaluation stigma against those who misuse alcohol. These factors must be addressed prior to a successful implementation of an alcohol harm reduction intervention.

Keywords

alcohol use; emergency department; brief intervention; stigma; education

Introduction:

Excessive alcohol use results in a significant health burden worldwide, with over 3.3 million alcohol-related deaths annually. Excessive alcohol use has been implicated in many diseases and adverse health outcomes, including violence and injuries, and limits people’s ability to contribute meaningfully to society.[1, 2] In Africa, excessive alcohol use is the leading avoidable risk factor for death and disability, and when it comes to drinking patterns, Sub-Saharan Africa has a remarkably high per capita consumption of alcohol, limited alcohol policies and enforcement, and a dramatic shortage of alcohol prevention and treatment settings. [3, 4] Emergency Departments (EDs) globally see a large number of patients with excessive alcohol use presenting for injury and various other complaints. Some data suggest that upwards of 40-45% of patients who suffer injuries who present for care in Africa, consumed alcohol prior to their injury.[5] In Moshi, Tanzania, we have almost 30% of our injured patients had positive alcohol testing on arrival for treatment of their injury.[6] Despite seeing such high levels, it is generally accepted that this underrepresents the true magnitude of excessive alcohol use in the region.

Addressing high levels of excessive alcohol use and associated harm remains a challenge. In high income settings, as well as in settings with adequate resources, there are evidence-based strategies such as a brief intervention (BI) which are often administered in EDs for patients who suffer injuries. These BI decrease alcohol intake, alcohol related consequences, and re-injury rates for up to 3 years post injury.[7-10] While BI has been adopted and used in primary care, hospital, and emergency department settings in the United States, there has been limited piloting and adaptation of a BI in a low resourced setting like Tanzania. One study in South Africa conducted a RCT for a BI in an ED and found this method to be effective in decreasing substance abuse in participants, especially in the areas with fewer resources.[11] In a location like Moshi, Tanzania, where there is a paucity of treatment options and high rates of excessive alcohol use amongst both the injury population and other at risk groups, implementing a BI is warranted.[12-16]

Despite the potential for BI as an evidence-based strategy, there have been multiple barriers to adoption and implementation. These include limited resources, training, and time to conduct the intervention.[17] Anecdotally, practitioners have noted resistance from ED practitioners due to the perceived unacceptability of the topic, as well as insufficient knowledge about alcohol guidelines and risk.[17] In order to further understand potential barriers to implementation of BI in Tanzania, we will evaluate the knowledge, attitudes, perceptions and practices of ED healthcare personnel toward alcohol use and excessive alcohol use. We will also evaluate whether attitudes or stigma is associated with current excessive alcohol use treatment practices. This information will lay the groundwork for an educational intervention and BI implementation for the ED at Kilimanjaro Christian Medical Center (KCMC), Moshi, Tanzania.

Methods:

Study Design and Ethics

This was a cross sectional evaluation of the knowledge, attitudes, perceptions and practices of ED healthcare personnel on the use and treatment of alcohol use among patients presenting for care to the Kilimanjaro Christian Medical Center in Moshi, Tanzania. This project was approved by the Ethics Committee of the Kilimanjaro Christian Medical University College, the Tanzanian National Institute of Medical Research and the Duke University Medical Center Institutional Review Board.

Setting

Kilimanjaro Christian Medical Center (KCMC) is the third largest hospital in the country, the regional referral center and a regional training center for all types of healthcare workers located in north-eastern Tanzania. KCMC welcomes all foreign clinical experts to augment their teaching curriculum for their students. The ED at KCMC sees about 70-100 patients, of whom 30 are admitted daily. Annually, KCMC ED sees about 2,000 patients who suffer injuries, of whom approximately 30% are positive for alcohol on arrival.[6] There are few Emergency Medicine trained physicians in the country of Tanzania. Currently, the KCMC is staffed by advanced medical officers (or non-physician providers), interns or registrars (who have completed medical school but not yet a residency) or by physicians with specialties other than Emergency Medicine.

Instruments

KAP—Our questionnaire was created based on knowledge, attitude and practice (KAP) questionnaires which have been shown to identify areas for quality improvement.[18, 19] We assessed for practitioner prior education and knowledge about alcohol use and low risk recommended alcohol drinking guidelines. [20] We assessed attitudes about the practitioner's role in discussing and treating alcohol, as well as any stigma. Finally, we asked practitioners to report current testing and treatment practices. In order to avoid a social desirability bias among the responses, we asked what 'you or your colleagues' believe or practice.

Perceived Alcohol Stigma—The Perceived Alcohol Stigma (PAS) scale was used to evaluate alcohol use stigma.[21] The PAS scale assesses expectations of devaluation and discrimination by querying how “most other people” think or act towards an individual with current or prior alcohol problems. The PAS has been psychometrically tested and reported in two areas of the PAS, “perceived devaluation” or an expectation of loss of status and “perceived discrimination” defined as an expectation of being denied certain social opportunities. An overall PAS score also can be used to evaluate global stigma. We report the scale results as a factor-based score where results range from 1 to 6, with higher values referring to higher PAS.

Alcohol Use Guidelines—In Tanzania, there is no clearly defined national alcohol use guideline. As such, we have chosen to not address the drink size clarification due to challenges with standardization in this population and have asked alcohol use multiple choice questions including “how many drinks per sitting?” (1-5), “how many drinks per week is risky? (7, 14, 21, 28, 35).” This was intended to gain the approximate amount of alcohol deemed unsafe by providers without requiring them to memorize or have been taught specific guideline responses. Given no national standard, we compared participant responses to South Africa’s Choose a Healthy Lifestyle guidelines (2015), Namibia’s Nutritional Guidelines for Management of Non-Communicable Diseases (2013), Uganda’s Community’s Health Department: Management of Non-Communicable Diseases (2016), and the United State’s Rethinking Drinking Campaign and the Dietary Guidelines from the Department of Health and Human Services.[22-26]

Data Collection—Pilot testing of the questionnaire identified challenges with question comprehension which led to editing items for grammar, comprehension and cultural applicability during the pilot period. During June 2016, after informed consent, an anonymous self-administered questionnaire was given to nursing students, nurses, advanced medical officers, interns, registrars, and fully trained physicians. The identical survey was administered in English or Swahili based on the comfort level of the participant. The English survey was translated to Swahili and back-translated by separate bilingual research personnel to ensure appropriate translation and comprehension. Practitioners completed the questionnaire and returned it to researchers. Data was entered manually into REDCap [27], an internet based dataset, and was reviewed for quality by the principal investigator (CAS). Data collected in the questionnaire included patient demographics, e.g. religion and personal use of alcohol, as well as work experience in casualty. To determine attitude or stigma, we used the validated PAS described above.[21] Attitudes, perceptions, and practices about alcohol use, as well as the role of health care providers in treatment were included in the questionnaire and responses were collected on a Likert Scale.

Data Analysis

Descriptive statistics (mean and standard deviation, median and interquartile range, and frequencies) were used to report sociodemographic characteristics of the sample. Knowledge, attitudes, practices and PAS were collected as Likert scales so we report them as frequencies of responses in each Likert option. Results are depicted in graphical format. The association between knowledge, attitudes and practices with PAS was evaluated with

Spearman correlation coefficient. A correlation coefficient matrix was then used as input for a network analysis to evaluate the pattern and hierarchy of associations. A weighted non-directional network was created from which network descriptive statistics were extracted. Since our sample size is restricted to the health care providers at KCMC, we did not use any estimation or tuning to identify parameters of the network. We mainly used the network disposition of the correlations to identify correlations of interested related to counseling patients with alcohol use. We adopted the concept of Shortest Path (SP) to verify variable within the network with direct or indirect association with PAS.[28] A path in a network is the connection (edges) between variables (nodes). For example, two nodes (A and B) may have several paths to represent their association in a network. Nodes A and B can be directly associated (no other nodes between them), or have indirect associations with other nodes (A connected to C which is connected to B). The SP is the shortest path between two nodes of interest, considering all other paths and edges weights (e.g. correlation coefficients). Thus, associations between variables for which the SP was a direct path from the variable to PAS were understood as main associations, given its significance for $P < 0.05$. For the variables without a direct path towards PAS, we evaluated their SP and interpreted as indirect association, reporting the variables that constituted each SP. All analysis and graphs were created with R Software for Statistical Computing v. 3.2.[29]

Results:

Demographics:

In June 2016, all 35 health care professionals who work in the ED of KCMC participated in this survey; data from 1 professional was missing a large number of responses so it was excluded from analysis. 82% (n=28) of the participants were females and the mean age was 43 years (SD 14, range 23-70). Most respondents were nurses (n=28, 82%), grew up in rural (n=21, 60%) or small town settings (n=12, 34%) and were 'somewhat' (n=13, 37%) or "very" religious (n=21, 60%). They cited Catholic (n=18, 51%), Lutheran (n=8, 23%), Pentecostal (n=4, 11%) or Muslim (n=3, 9%) faiths. Most healthcare practitioners never drank alcohol (n=19, 54%) or drank alcohol less than once a month (n=7, 20%). (See Table 1)

Knowledge about alcohol use

Healthcare practitioners agreed (n=12, 35%) or strongly agreed (n=21, 62%) that they discussed excessive alcohol use during their training. Similarly, most agreed (n=18, 53%) or strongly agreed (n=12, 35%) that they discussed counseling for excessive alcohol use in their training. Most practitioners believed that patients who suffered an injury were most likely drinking (91.2%, n=31) and 73% (n=25) agree or strongly agreed that suffering an injury due to alcohol caused them to be a 'hazardous or harmful drinker'. Overall, 12% (n=12) stated that asking about alcohol use was not their role as an ED healthcare provider. Most (97.0%, n=32) agreed that talking to patients about alcohol use did help to decrease their use. (Figure 1)

Knowledge about recommended alcohol use was more limited. The modal response for daily and weekly alcohol limits were 3 or 5 for males and 2 for females. Both of these responses

are higher than most African and US based recommendations. Similarly for weekly safe alcohol limits, the modal responses were 21 for males and 14 for females which again is higher than internationally recommended limits.(Table 2) Providers agreed that many patients drink alcohol (70.6%, n=24), and believe that alcohol is a problem among the ED patient population (85.3%, n=29).

Perceptions about alcohol use

Most participants felt comfortable asking patients (88.2%, n=30) or counseling patients (94.1, n=32) about their risk with drinking. Also, most participants were willing to implement alcohol screening among patients who suffer injuries (70.5%, n=24) and the same number were motivated to do so. (70.5%, n=24). Most practitioners (88.2%, n=30), were willing to learn about reducing excessive alcohol use in patients who suffer injuries. Participants agreed that knowing about patient's alcohol use improves care they provide (88.2%, n=30).

Although participants agreed that most patients who suffer injuries were drinking when the injury occurred (91.2%, n=31), they disagreed that excessive alcohol use is a problem with KCMC patient population (85.3%, n=29). Furthermore, most agree (71%, n=24) that a large amount of patients drink alcohol. (Figure 2)

Current Practices

As seen in Figure 3, most participants agreed that it is common to ask patients about alcohol use behaviors (91.2%, n=21), but only 41.2% (n=12) reported always asking as part of their practice. The main reason for not asking about alcohol use behavior was a lack of time (60.0%), but 25% did not respond to this question. Similarly, the majority of participants agreed it is common to ask about tobacco use behavior (72.7%, n=24). (Figure 3)

Although agreeing that is common to ask, only 35.3% (n=12) agreed that is it common to test for alcohol use, and only 14.7% reported always testing for alcohol use among patients who suffer injuries (n=5). Given equipment restraints in Tanzania, alcohol testing is most commonly done by smelling patient's breath (65.6%, n=21) and clinical exam/patient communication (18.8%, n=6). As for reasons for not testing, the most frequent was not having testing equipment (70.4%, n=19) and lack of time (22.2%, n=6). (Figure 3)

Only 27.3% of the participants believe that there are resources to refer patients when excessive alcohol use is determined, although 58.8% (n=20) reported always counseling patients to reduce their drinking habits. (Figure 3)

Stigma

The average PAS was 3.4 (SD=0.9) with 66% (N=23) of the participants scoring high in the PAS Likert scale (above 3). Stratifying the PAS, we observed an average Perceived Discrimination score of 3.3 (SD=1.1) representing 57% (N=20) of participants with high scores. Perceived Devaluation had an average score of 3.6 (SD=1.23) and 66% of participants scoring high (N=23). More specifically, more than 35% of the respondents disagreed that a person who had excessive alcohol use is just as intelligent as the average

person, and more than 30% disagreed that alcohol users are just as trustworthy (Figure 4). Similarly, more than 30% would not accept a fully recovered alcoholic as a teacher for young children and 70% would not hire a former alcoholic to take care of their children. Concerning treatment, 46% agreed that entering an alcohol treatment is a sign of failure and 87% agreed that people think less of someone who has been in an alcohol treatment.

On the other hand, 74% of the respondents agreed that most employers would hire a former alcoholic and 51% disagreed that most employers would pass over the application for a job of a former alcoholic. (Figure 4) In the social/community side, 63% agreed that most people would treat a former alcoholic like they treat anyone else, 77% would be willing to accept a former alcoholic as a close friend, 77% agreed that most young women would be reluctant to date a man who has been hospitalized for alcoholism and 77% agree they would take the opinion of a person in alcohol treatment less seriously.

Association between knowledge, attitudes and current practices with perceived alcohol stigma

The network analysis identified the pattern of association between the knowledge, attitudes and practices regarding alcohol use. Given the project aim of understanding barriers to treatment, we analyzed how each question in the KAP survey and the overall PAS score were associated with the practice of "Counseling patients about harmful drinking behavior." The shortest paths, and strongest association with our outcome, involved previous education, openness to discussing substance use with patients and practice of testing for alcohol use.

Two factors which were positive associated with willingness to provide treatment were having education received about excessive alcohol use and how to counsel patients. (Table 3) The willingness to "learn about reducing alcohol use" and "implement alcohol use screening" were associated with having education about at-risk alcohol use and were indirectly and positively associated with our outcome, counseling patients. Our outcome was also positively associated with feeling that it is common to "ask about alcohol" or "ask about tobacco." Not surprisingly, health practitioners who already conducted testing for alcohol use were also likely to counsel patients.

The concepts that it was 'not their role to ask about alcohol' and those that didn't 'believe knowing about alcohol use disorders would improve care' had a direct negative association with counseling patients about excessive alcohol use. Similarly, believing 'injuries were likely due to alcohol use' and that 'talking to patients about alcohol can be successful' were indirectly associated with positive treatment attitudes. Stigma against alcohol use and denial of alcohol as a problem amongst patients showed a negative indirect association with treatment.

Discussion:

The opportunity to address excessive alcohol use in Emergency Departments, is a unique and potentially impactful public health-minded intervention aimed at a high risk group. Our results found that in an ED in Tanzania, there are very positive attitudes towards addressing excessive alcohol use, very poor knowledge of recommended alcohol use limits, and a

significant stigma against those with excessive alcohol use. To our knowledge, there is no current literature evaluating the perceptions of healthcare practitioners in a limited- resource setting regarding alcohol use. The attitudes, knowledge, practices and stigma regarding excessive alcohol use are invaluable in developing and establishing a brief intervention to be administered in the ED at KCMC for patients presenting with alcohol-related injuries.

Overall, our study demonstrated a willingness to intervene and treat excessive alcohol use. A majority report it is their role and responsibility to ask about drinking behavior, tobacco use behavior, and counseling reduction in excessive alcohol use. Nearly all participants claim having discussed excessive alcohol use during their training and agreed that engaging patients in conversation regarding the need to cut back can be impactful. Many also endorsed having received training in this type of counseling while in school. This is encouraging on two fronts: there is awareness of what it means to use alcohol excessively and an understanding that simply having a conversation can lead to changes in risky drinking behaviors. Alternatively, other studies have found that practitioners have and retained insecurities in their role in addressing alcohol misuse.[30] While a relatively positive attitude has been found in other studies targeting primary care settings,[31, 32] our overwhelmingly positive findings further validate the relevance and feasibility of further intervention work.

However, when we explored healthcare practitioners' knowledge of recommended alcohol use limits, a critical aspect for establishing excessive alcohol use behaviors, healthcare professionals did not appear to be aware of this information. For this section, we asked a 4-answer multiple choice question and the average correct response rate for knowledge was about 25% or equal to chance/guessing. Participants' modal responses were all higher than many of the African and international guidelines on alcohol use, suggesting our providers have limited prior knowledge on alcohol use guidelines and are overestimating safe alcohol limits. Similarly, multiple studies from high income settings confirm our results that practitioners have limited training in knowledge about excessive alcohol use, treatment options, and counselling skills.[33-39] Yet some studies have found that with appropriate education and training, the implementation of interventions improves amongst healthcare providers.[40, 41]

Other frequently cited barriers to an ED intervention include a practitioner's own relationship to alcohol[42], the limited holistic view of a traditional ED practitioner[43], limited financial or managerial support [44], time, and clinical inertia.[45] At KCMC, some of these barriers appear less significant; providers have education on excessive alcohol use and patient counseling, do not personally use alcohol on the whole, and have adopted a more active role in alcohol use reduction in their practice. Of concern though, our stigma scale amongst healthcare providers did show a very significant negative stigma against those who have excessive alcohol use. Over 50% of participants agree that people would not hire a former alcoholic to take care of their children and over 70% of participants agree that most people think less of a person who has been in alcohol treatment. While excessive alcohol use education was associated with lower rates of stigma, further education is warranted for our practitioners to allow for improved relationship between our providers and our patients. Those with more training and education about alcohol use had less stigma towards alcohol users and were more willing to ask about and test for alcohol. This stigma likely will

severely jeopardize the practitioner-patient relationship which has been shown to be very instrumental to a successful brief intervention. [46-49]

Ultimately, this project not only highlights the areas for further education for ED practitioners but also parallel areas for infrastructure development like alcohol treatment facilities which are absent in the Kilimanjaro region. This project gives us a platform upon which to create an educational intervention to address knowledge gaps and attitudes towards excessive alcohol use and alcohol addiction recovery. These education points, in combination with the already positive attitudes about brief alcohol intervention in the ED at KCMC could make an intervention very successful for the KCMC population and other low-resource settings. Our network findings that those with more training and education about alcohol use had less stigma towards alcohol users and were more willing to ask about, and test for alcohol support this positive outlook and educational opportunity. Incorporating the brief negotiated interview into education and clinical practice could be an important step in addressing alcohol misuse in the ED at KCMC.

Limitations

Our results have a few limitations that should be taken into account. First, we have a very small sample size of 34 health care participants, the entirety of staff in the ED. Similarly, the ambiguity because of the lack of Tanzanian national alcohol use guidelines, the difference in drink or unit size and grams of alcohol per drink was also difficult to address in our short survey. We attempted to compare our results to multiple national guidelines in order to better describe the practitioners overall knowledge of alcohol rather than any specific guideline. Next, our topic of alcohol use is subject to a social desirability bias. Healthcare providers might state that it is their role to deal with a known health issue when directly asked, which is one reason we used self-administered anonymous questionnaires. Yet, we have seen in multiple other studies that healthcare workers especially in the Emergency Department are more likely to state that it is not 'their job or their role'. [30] Similarly, responses such as one's drinking behavior could also be subject to social desirability bias. Then, while participants were very eager to participate in alcohol related patient encounters by survey, it is likely that their actions on shift are far different from knowledge and attitudes. In this case, further research is warranted to observe clinical behaviors about taking a history of alcohol use and performing an intervention.

The PAS scale we used has not yet been validated in the Tanzanian context. Prior to its use performed rigorous linguistic translation and back translation to Swahili, performed a group translation and discussion to ensure language comprehension and tried to focus bilingual participants to use the English version. Similarly, during cultural translation, we assembled a bilingual group of research nurses to discuss the cultural applicability of the scale; while we believe this was the most rigorous cultural adaptation possible, the psychometric properties evaluation of the scale is ongoing and not yet published. Finally, the KAP survey method that we used is good for building an educational program, it doesn't always allow you to fully capture judgement or reasoning; as such further qualitative research is warranted to better describe some of the stigma associated with excessive alcohol use and treatment. We chose to use a network analysis to guide our interpretation of the correlation between the

variables in the study, however we understand that this method is highly dependent on the sample size and should be used with caution. Thus, we only used descriptives of the simple network built based on Spearman correlations, we did not use a method to estimate or fine tune the paths. Although this is not the most modern usage of a network analysis, it did help us identify the most relevant patterns of correlation to be depicted in the paper. Full correlogram with all the correlation values is submitted as an appendix.

Conclusion

Health care practitioners in the Emergency Department of the Kilimanjaro Christian Medical Center in Moshi, Tanzania are enthusiastic about asking patients about alcohol and initiating an intervention. Unfortunately, their knowledge about drinking guidelines and treatment is limited. Similarly, there is a concerning negative perception or stigma about excessive alcohol use amongst professionals which might hinder further ED based alcohol interventions. As prior exposure to excessive alcohol use training is associated with less stigma, and less stigma is associated with more willingness to intervene, an educational intervention about alcohol use guidelines, treatment options and interventions, which also addresses this stigma, might improve the patient-provider relationship and ultimately lead to more successful interventions. These findings will guide our continued work in Tanzania but will also inform strategies and priorities in similar settings in the broader region, particularly in East Africa.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

Acknowledgements:

We would like to acknowledge our KCMC/Duke ED Research Team without whom none of our research would be possible. Similarly, we thank the KCMC Emergency Department staff for welcoming us into their Department and taking part in this project. Your compassion for patients and eagerness to improve your department has allowed this research to occur.

Funding: This work was supported by the National Institute of Health (K01TW010000, Staton).

References

1. Rehm J, Mathers C, Popova S, Thavorncharoensap M, Teerawattananon Y, Patra J: Global burden of disease and injury and economic cost attributable to alcohol use and alcohol-use disorders. *The Lancet* 2009, 373: 2223–2233
2. Rehm J, Rehn N, Room R, Monteiro M, Gmel G, Jernigan D, Frick U: The global distribution of average volume of alcohol consumption and patterns of drinking. *European addiction research* 2003, 9: 147–156. [PubMed: 12970583]
3. Casswell S, Thamarangsi T: Reducing harm from alcohol: call to action. *The Lancet* 2009, 373: 2247–2257.
4. Lim S, Vos T, Flaxman A: A comparative risk assessment of burden of disease and injury attributable to 67 risk factors in 21 regions, 1990–2010: a systematic analysis for the Global Burden of Disease Study 2010. *Lancet* 2012, 380: 2224–2260. [PubMed: 23245609]
5. Lasebikan V, Adebayo S: Need for screening for alcohol and drugs in Emergency Trauma Units. *East African medical journal* 2013, 90: 164–170. [PubMed: 26859007]

6. Staton CA, Msilanga D, Kiwango G, Vissoci JR, de Andrade L, Lester R, Hocker M, Gerardo CJ, Mvungi M: A prospective registry evaluating the epidemiology and clinical care of traumatic brain injury patients presenting to a regional referral hospital in Moshi, Tanzania: challenges and the way forward. *International Journal of Injury Control and Safety Promotion* 2017, 24: 69–77. [PubMed: 26239625]
7. D'Onofrio G, Degutis LC: Screening and brief intervention in the emergency department. *Alcohol Research and Health* 2004, 28: 63. [PubMed: 19006993]
8. D'Onofrio G, Fiellin DA, Pantalon MV, Chawarski MC, Owens PH, Degutis LC, Busch SH, Bernstein SL, O'Connor PG: A brief intervention reduces hazardous and harmful drinking in emergency department patients. *Annals of emergency medicine* 2012, 60: 181–192. [PubMed: 22459448]
9. Fleming MF, Barry KL, Manwell LB, Johnson K, London R: Brief physician advice for problem alcohol drinkers: a randomized controlled trial in community-based primary care practices. *Jama* 1997, 277: 1039–1045. [PubMed: 9091691]
10. Gentilello LM, Rivara FP, Donovan DM, Jurkovich GJ, Daranciang E, Dunn CW, Villaveces A, Copass M, Ries RR: Alcohol interventions in a trauma center as a means of reducing the risk of injury recurrence. *Annals of surgery* 1999, 230: 473. [PubMed: 10522717]
11. Sorsdahl K, Stein DJ, Corrigall J, Cuijpers P, Smits N, Naledi T, Myers B: The efficacy of a blended motivational interviewing and problem solving therapy intervention to reduce substance use among patients presenting for emergency services in South Africa: A randomized controlled trial. *Substance abuse treatment, prevention, and policy* 2015, 10:46.
12. Mongi AS, Baisley K, Ao TT-H, Chilongani J, Aguirre-Andreasen A, Francis SC, Shao J, Hayes R, Kapiga S: Factors associated with problem drinking among women employed in food and recreational facilities in northern Tanzania. *PloS one* 2013, 8: e84447. [PubMed: 24391956]
13. Isaksen AB, Østbye T, Mmbaga BT, Daltveit AK: Alcohol consumption among pregnant women in Northern Tanzania 2000–2010: a registry-based study. *BMC pregnancy and childbirth* 2015, 15: 205. [PubMed: 26337194]
14. Mnyika K, Masatu M, Klepp K: Prevalence of and predictors of substance use among adolescents in rural villages of Moshi district, Tanzania. *East African journal of public health* 2011, 8: 1–5. [PubMed: 22066274]
15. Mitsunaga T, Larsen U: Prevalence of and risk factors associated with alcohol abuse in Moshi, northern Tanzania. *Journal of Biosocial Science* 2008, 40: 379–399. [PubMed: 17956648]
16. Ao TT-H, Sam N, Kiwelu I, Mahal A, Subramanian S, Wyshak G, Kapiga S: Risk factors of alcohol problem drinking among female bar/hotel workers in Moshi, Tanzania: a multi-level analysis. *AIDS and Behavior* 2011, 15: 330–339. [PubMed: 21082340]
17. Johnson M, Jackson R, Guillaume L, Meier P, Goyder E: Barriers and facilitators to implementing screening and brief intervention for alcohol misuse: a systematic review of qualitative evidence. *Journal of Public Health* 2010, 33: 412–421. [PubMed: 21169370]
18. Kishore V, Lynch S, Pichon J, Theall K, Johnson S, Roberson E, Hinton S: Knowledge, attitudes and practice relating to hazardous alcohol use across the continuum of care in a community healthcare centre. *Drugs: education, prevention and policy* 2011, 18: 60–68.
19. Organization WH: Substance Use in Southern Africa, Knowledge, Attitude, Practices and Opportunities for Intervention. Switzerland: World Health Organization; 2003.
20. Alcoholism NIAAA: Drinking Levels Defined. 2016.
21. Glass JE, Kristjansson SD, Bucholz KK: Perceived alcohol stigma: factor structure and construct validation. *Alcoholism: Clinical and Experimental Research* 2013, 37.
22. Department of Health RoSA: Promoting Healthy Lifestyle: South Africa cares and is taking responsibility to promote healthy lifestyles. 2015.
23. Services NMoHaS: Nutrition Guidelines for Prevention and Management of NCDs. 2013.
24. Ministry of Health RoU: Management of Non-Communicable Diseases. 2016.
25. Services UDoHaH: Rethinking drinking: Alcohol and your health. NIH Pub 2010.
26. Agriculture UDo, Services UDoHaH: Dietary Guidelines for Americans 2015–2020. 2015.
27. Harris PA, Taylor R, Thielke R, Payne J, Gonzalez N, Conde JG: Research electronic data capture (REDCap)—A metadata-driven methodology and workflow process for providing translational

- research informatics support. *Journal of Biomedical Informatics* 2009, 42: 377–381. [PubMed: 18929686]
28. Costantini G, Epskamp S, Borsboom D, Perugini M, Mottus R, Waldorp LJ, Cramer AO: State of the aRt personality research: A tutorial on network analysis of personality data in R. *Journal of Research in Personality* 2015, 54: 13–29.
 29. Foundation TR: *The R Project for Statistical Computing*. 2016.
 30. Anderson P, Laurant M, Kaner E, Wensing M, Grol R: Engaging general practitioners in the management of hazardous and harmful alcohol consumption: results of a meta-analysis. *Journal of studies on alcohol* 2004, 65: 191–199. [PubMed: 15151349]
 31. Harris B, Yu J: Attitudes, perceptions and practice of alcohol and drug screening, brief intervention and referral to treatment: a case study of New York State primary care physicians and non-physician providers. *Public health* 2016, 139: 70–78. [PubMed: 27311990]
 32. Miller PM, Thomas SE, Mallin R: Patient attitudes towards self-report and biomarker alcohol screening by primary care physicians. *Alcohol and alcoholism* 2006, 41: 306–310. [PubMed: 16574672]
 33. Beich A, Gannik D, Malterud K: Screening and brief intervention for excessive alcohol use: qualitative interview study of the experiences of general practitioners. *Bmj* 2002, 325: 870. [PubMed: 12386040]
 34. Aalto M, Saksanen R, Laine P, Forsström R, Raikaa M, Kiviluoto M, Seppä K, Sillanaukee P: Brief Intervention for Female Heavy Drinkers in Routine General Practice: A 3-Year Randomized, Controlled Study. *Alcoholism: Clinical and Experimental Research* 2000, 24: 1680–1686.
 35. Aalto M, Seppä K, Mattila P, Mustonen H, Ruuth K, Hyvärinen H, Pulkkinen H, Alho H, Sillanaukee P: Brief intervention for male heavy drinkers in routine general practice: a three-year randomized controlled study. *Alcohol and Alcoholism* 2001, 36: 224–230. [PubMed: 11373259]
 36. Aalto M, Pekuri P, Seppä K: Obstacles to carrying out brief intervention for heavy drinkers in primary health care: a focus group study. *Drug and alcohol review* 2003, 22: 169–173. [PubMed: 12850903]
 37. Aira M, Kauhanen J, Lariivaara P, Rautio P: Factors influencing inquiry about patients' alcohol consumption by primary health care physicians: qualitative semi-structured interview study. *Family Practice* 2003, 20: 270–275. [PubMed: 12738695]
 38. Deehan A, Templeton L, Taylor C, Drummond C, Strang J: How do general practitioners manage alcohol-misusing patients? Results from a national survey of GPs in England and Wales. *Drug and alcohol review* 1998, 17: 259–266. [PubMed: 16203492]
 39. Deehan A, Templeton L, Taylor C, Drummond C, Strang J: Low detection rates, negative attitudes and the failure to meet the "Health of the Nation" alcohol targets: findings from a national survey of GPs in England and Wales. *Drug and alcohol review* 1998, 17: 249–258. [PubMed: 16203491]
 40. Kaner EF, Heather N, Mcavoy BR, Lock CA, Gilvarry E: Intervention for excessive alcohol consumption in primary health care: attitudes and practices of English general practitioners. *Alcohol and Alcoholism* 1999, 34: 559–566. [PubMed: 10456584]
 41. Kaner EF, Lock CA, McAvoy BR, Heather N, Gilvarry E: A RCT of three training and support strategies to encourage implementation of screening and brief alcohol intervention by general practitioners. *Br J Gen Pract* 1999, 49: 699–703. [PubMed: 10756610]
 42. Aalto M, Pekuri P, Seppä K: Primary health care professionals' activity in intervening in patients' alcohol drinking: a patient perspective. *Drug and alcohol dependence* 2002, 66: 39–43. [PubMed: 11850134]
 43. Brooker C, Peters J, McCabe C, Short N: The views of nurses to the conduct of a randomised controlled trial of problem drinkers in an accident and emergency department. *International Journal of Nursing Studies* 1999, 36: 33–39. [PubMed: 10375064]
 44. Désy PM, Perhats C: Alcohol screening, brief intervention, and referral in the emergency department: an implementation study. *Journal of Emergency Nursing* 2008, 34: 11–19. [PubMed: 18237661]
 45. Huntley JS, Patton R, Touquet R: Attitudes towards alcohol of emergency department doctors trained in the detection of alcohol misuse. *Annals of the Royal College of Surgeons of England* 2004, 86: 329. [PubMed: 15333166]

46. Hutchings D, Cassidy P, Dallolio E, Pearson P, Heather N, Kaner E: Implementing screening and brief alcohol interventions in primary care: views from both sides of the consultation. *Primary Health Care Research & Development* 2006, 7: 221–229.
47. Abraham TH, Lewis ET, Drummond KL, Timko C, Cucciare MA: Providers' perceptions of barriers and facilitators to disclosure of alcohol use by women veterans. *Primary health care research & development* 2017, 18: 64–72. [PubMed: 27692026]
48. de Guzman R, Leonard NR, Gwadz MV, Young R, Ritchie AS, Arredondo G, Riedel M: "I thought there was no hope for me": A behavioral intervention for urban mothers with problem drinking. *Qualitative Health Research* 2006, 16: 1252–1266. [PubMed: 17038756]
49. Lock CA: Alcohol and brief intervention in primary health care: what do patients think? *Primary Health Care Research & Development* 2004, 5: 162–178.

Highlights

- In Tanzania, healthcare practitioners have positive attitudes towards addressing at-risk alcohol use
- While practitioners endorsed having prior training, many still lacked the knowledge of recommended alcohol use limits.
- There is significant stigma among healthcare providers against those who use alcohol
- Having prior training was associated with lower stigma and more positive attitudes towards performing an intervention to curb at risk alcohol use.

Figure 1:
Knowledge about alcohol use, behaviors among healthcare workers (N=34)

Figure 2:
Perceptions and comfort level about alcohol among Healthcare workers (N=34)

Figure 3:
Current alcohol treatment by Healthcare workers (N=34)

Table 1.

Sociodemographic characteristics of health care professionals in the Emergency Department (ED)

Female, N (%)		28 (82.4)
Age, Mean (SD)		43.3 (14.2)
Occupation, N (%)	Physician	1 (2.9)
	Nurse	28 (82.4)
	Senior Medical Officer	2 (5.9)
	Resident	3 (8.8)
Speciality, N (%)	Emergency Medicine	19 (55.9)
	Medicine	6 (17.5)
	Surgery	4 (11.8)
	OB/Gyn	3 (8.8)
	Orthopedics	1 (2.9)
	Other	1 (2.9)
Location, N (%)	City	2 (5.7)
	Township	12 (34.3)
	Rural/Farm	21 (60.0)
Religion, N (%)	Catholic	18 (51.4)
	Muslim	3 (8.6)
	Lutheran	8 (22.9)
	Pentecostal	4 (11.4)
	Other	2 (5.7)
Consume Alcohol, N (%)	Never	19 (54.3)
	Less than once a month	7 (20.0)
	1-3 days per month	4 (11.4)
	3-4 days per week	1 (2.9)
	Refused	3 (8.6)
	Don't know	1 (2.9)
Work experience in the ED	Less than 6 months	7 (20.6)
	6 months to one year	5 (14.7)
	1-5 years	13 (38.2)
	More than 5 years	9 (26.5)

Table 2:

Recommended Alcohol Use Amounts

		Our responses mode (% responders)	Uganda	South Africa	United States (NIAAA)	United States (DHHS)
Drink Size		N/A	330ml standard beer	N/A	14g alcohol	14g alcohol
Drinks per Day	Males	3 or 5 (35.3 or 35.3%)	2	2 beers or glasses of wine	4	2
	Females	3 (52.9%)	1		3	1
Drinks per week	Males	21 (41.2%)	N/A	N/A	14	N/A
	Females	14 (36.4%)	N/A	N/A	7	N/A

Table 3:

Network Analysis Results

Outcome	Direct associations (R/P value)	Indirect association (R/P value w/ connector)
Counseling patients about harmful drinking behavior	Education about at risk alcohol behavior (.34/0.05)	Willingness to learn about reducing alcohol use (.53/0.01) Willingness to implement alcohol use screening (.47/0.01)
	Education about counseling patients (.41/0.02)	-
	Not their role to ask about alcohol use (-.36/0.04)	-
	Know about alcohol use does not improve care (-.38/0.03)	Talking to patients about alcohol can be successful (-.48/0.01) Alcohol is not a problem among patients (.57/0.01) Injuries are related to alcohol (-.61/0.01) Perceived alcohol stigma (-.35/0.04)
	Common to ask about alcohol use (.40/0.02)	-
	Conduct breath and serum testing (.36/0.04)	Motivated to implement screening and testing of alcohol use (.44/0.01) Resources for referring alcohol patients availability (-.36/0.04)