SBIRT SCREENING IN PRIMARY CARE FOR WOMEN OF REPRODUCTIVE AGE TO AID IN THE IDENTIFICATION OF ALCOHOL USE PATTERNS FOCUSING ON PREVENTION OF FETAL ALCOHOL EXPOSURE

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Abstract

The over consumption of alcohol can directly correlate with negative effects on health and quality of life. When vulnerable subjects such as pregnant women and subsequently the fetus is alcohol exposed lifelong detrimental consequences can ensue such as Fetal Alcohol Spectrum Disorder (Jones, Smith, Ulleland, & Streissguth, 1973). Although most women reduce their alcohol intake during pregnancy, 45% of pregnancies in the United States are unplanned (Finer & Zolna, 2016). The combination of social patterns of alcohol use in women of childbearing age and the prevalence of unintended pregnancy set the stage for an alcohol exposed fetus. Late recognition of an unintended pregnancy exposed a fetus to levels of alcohol capable of teratogenic effects (Balachova et al., 2015). Research asserts that prevention of alcohol-exposed pregnancies should begin before conception by identifying unhealthy drinking patterns among women of reproductive age. Alcohol screening and brief interventions in medical settings can significantly reduce alcohol use and potentially decrease the prevalence of a 100 % preventable condition such as FASD.

Key words: Alcohol use, alcohol, substance use, screening, screening tools, women, women of reproductive age, female, childbearing, fetal alcohol spectrum disorder, fetal alcohol syndrome, SBIRT, pregnancy, and primary care

Table of Contents

List of Tables

List of Figures

The Use of SBIRT Screening in Primary Care for Women of Reproductive Age to Aid in the Identification of Alcohol Use Patterns Focusing on Prevention of Fetal Alcohol Exposure

According to the Dietary Guidelines for Americans 2015-2020, U.S Department of Health and Human Services and U.S. Department of Agriculture, moderate drinking is up to one drink per day for women and up to two drinks per day for men. The National Institute on Alcohol Abuse and Alcoholism (NIAAA) further defined drinking levels as binge drinking that occurs after four drinks for women and five drinks for men in about two hours; and low risk for developing alcohol use disorder (AUD) which constitutes no more than three drinks on any single day and no more than seven drinks per week. One alcoholic drink-equivalent is described as containing 14 g (0.6 fluid oz.) of pure alcohol, which constitutes twelve fluid ounces of regular beer or five fluid ounces of wine (Figure 6). In addition, The Substance Abuse and Mental Health Services Administration (SAMHSA) listed heavy alcohol use as binge drinking on five or more days in the past month. Exceeding the low risk drinking level places populations at a higher risk for adverse effects and in some instances, represent a lifelong of irreversible outcomes. Therefore, certain people should avoid alcohol completely, including those who plan to drive a vehicle or operate machinery; take medications that interact with alcohol; have a medical condition that alcohol can aggravate; and are pregnant or trying to become pregnant (NIAAA, 2017).

When vulnerable subjects such as pregnant women and subsequently the fetus are exposed to alcohol, lifelong detrimental consequences can ensue. Physical, cognitive, and behavioral disabilities are well-established unintended consequences of fetal alcohol exposure currently known as Fetal Alcohol Spectrum Disorder (Jones et al., 1973). Fetal Alcohol Spectrum Disorder (FASD) is an umbrella term for the range of conditions resulting from fetal

alcohol exposure. Jones and Smith first defined FASD in 1973 after they conducted a study of eight children with no known genetic relationship, who presented with very distinct characteristics. The common characteristics included growth deficiency, developmental delay, cranial facial, limb, and cardiovascular defects. The common denominator among these children was a mother with chronic alcoholism but no other substance abuse during pregnancy (Jones et al., 1973). The study in 1973, constituted the first concrete association between fetal alcohol exposure and congenital abnormalities providing evidence that alcohol exposure can cause damage during all stages of prenatal development (Gupta et al., 2016; Sawada et al., 2012; Tan et al., 2015;) and is 100 % preventable.

Despite several attempts to raise awareness of the adverse effects of alcohol use during pregnancy among women of reproductive age (warning labels in alcoholic beverages, prevention campaigns), FASD continues to be foreseeable, proving it is an underestimated problem worldwide with catastrophic individual, family, and societal costs. According to Roozen et al. (2016), the current approaches to identify and prevent alcohol consumption during pregnancy are not effective. Bazzo et al. (2017) reports the existing awareness campaigns to prevent FASD do not provide a clear way to evaluate results; thus, the effects of these interventions are not known or validated. New strategies should be designed to target women of reproductive age.

The CDC (2015) found that one in two women of childbearing age (18-44 years) report alcohol use in the past month and one in eight report binge drinking. The CDC proposes a screening tool to help reduce fetal alcohol exposure that should be offered to women of reproductive age. Alcohol Screening and Brief Intervention (SBI) helps identify women's drinking patterns with potential referral to specialized treatment (Screening, Brief Intervention, and Referral to Treatment or SBIRT). A preventable condition such as FASD must be eradicated.

No child should have to experience the devastating consequences of living with a preventable condition. The prevention of alcohol exposure during pregnancy is a public health priority. Primary care providers could potentially make a difference by implementing SBIRT screening to help identify women of reproductive age at risk for alcohol abuse in hopes of preventing fetal alcohol exposure.

Background and Significance

The Behavioral Risk Factor Surveillance System report (BRFSS) is the nation's premier system of health-related telephone surveys that collects data in all 50 states. Alaska BRFSS results of weighted prevalence estimates of alcohol use among women age 18-44 years identified 55.6% alcohol use and 22.6% binge drinking (Figure 8, Figure 9 & Figure 10). Although most women reduce their alcohol intake during pregnancy (Roberts, Ralph, Wilsnack, & Foster, 2016; Roberts, Wilsnack, Foster, & Delucchi, 2014; Terplan, Cheng & Chisolm, 2014), pregnancy recognition may be delayed among women not intending to become pregnant. In 2011, 45% of pregnancies in the United States were unintended (Finer & Zolna, 2016) showing a decline from 51% in 2008 (Finer & Henshaw, 2006); yet still a significantly high prevalence. In 2010, the Alaska incidence of unintended pregnancies was 48 % in women ages 15-44 (CDC, 2017). The combination of social alcohol use in women of childbearing age and the higher prevalence of unintended pregnancy among this same population sets the stage for alcohol exposure in utero. Where there is late recognition of unintended pregnancy under these circumstances, providers must question whether in utero alcohol exposure will result in demonstrable teratogenic effects during the first trimester when vital fetal organs are developing (Roozen et al., 2016). Teratogenic effects continue to be a risk throughout pregnancy with ongoing alcohol exposure affecting specific organs at various times in the pregnancy (Chidambaram & Bisson, 2013; Jones

et al., 1973; Sawada et al., 2012). Approximately 3.3 million U.S. women aged 15-44 years who were not pregnant and not sterile were at risk for an alcohol-exposed pregnancy during 2011-2013 (Green et al., 2016).

FASD can be classified according to degree of involvement into Fetal Alcohol Syndrome (FAS), Alcohol Related Neurodevelopmental Disorder (ARND), and Alcohol-Related Birth Defects (ARBD). FAS is the most involved end of the FASD (Figure 4). Abnormal facial features, growth retardation, central nervous system dysregulation, learning, memory, attention span, communication, vision, hearing, and fetal death are all associated with fetal alcohol exposure (CDC, 2017). ARND encompasses intellectual disabilities and problems with behavior and learning. ARND expression might include difficulty with mathematics, memory, attention, judgement, and/or poor impulse control (CDC, 2017). Birth defects resulting from ARBD can include heart, kidneys, bones, or hearing (CDC, 2017). The U.S surgeon general, the CDC, the American Academy of Pediatrics (AAP), and the American Academy of Obstetricians (AAO) have concluded that there is no safe amount of alcohol use during pregnancy (AAP, 2000; Adams et al., 2002) yet many obstetric providers do not discourage light alcohol use in pregnancy. In order to affect the prevalence of alcohol-exposed pregnancies (AEP), it is imperative to intervene prior to conception. This approach will help reduce or eliminate drinking among those identified at risk for an AEP based upon their drinking patterns.

Prevalence and Cost

Over the years, thousands of FASD cases have been reported and several more are estimated to remain undiagnosed (Roozen et al., 2016). Establishing prevalence rates represents a challenge because diagnosis is complex, time consuming, and costly (Petrenko & Alto, 2017). FASD is now recognized as an international public health problem (Bazzo et al., 2017) and the

number one cause of intellectual disability in the world (Sarkar, Einarson, & Koren, 2010). In the United States, two to five percent of first-grade students have FASD (May et al., 2014). According to the CDC (2017), it is unknown exactly how many people currently have FASD. The estimated overall prevalence FASD was ten cases per 1,000 or 1% of all live births in the United States and estimated lifetime cost of two million per case (Floyd et al., 2007). The CDC calculated the lifetime cost for an individual with FASD to be $2 million in 2002. In the United States, the annual cost of FASD was nearly $5.3 billion in 2007 (Hoyme et al., 2016). In contrast, there is a significant savings through prevention. One prevented case of FAS saves $130,000 in the first five years; $360,000 in ten years; $587,000 in fifteen years; and more than one million in thirty years (Lupton, Burd, & Hardwood, 2004).

These statistics represent a burden to society in terms of financial cost, but most significantly in terms of human suffering among people affected by this condition. Ironically, these devastating abnormalities and the healthcare cost associated with them, are the only non-genetic conditions that are 100% preventable when alcohol exposed pregnancies are averted; and yet, FASD continues to jeopardize the quality of life of future generations (Roozen et al., 2016).

The burden of FASD among generations prompted the formation of the Interagency Coordinating Committee on Fetal Alcohol Spectrum Disorders (ICCFASD) in 1996 (Figure 5). This organization includes members from the Department of Education (ED), Department of Health and Human Services (DHHS) and the Department of Justice (DOJ). ICCFASD seeks to improve communication and collaboration between agencies to address the most significant issues related to FASD that include but are not limited to health, education, developmental disability, research, justice, and social services in hopes to improve the quality of life of those living with FASD and prevent new cases (NIAAA, 2015). Despite efforts to avert FASD, its

continued prevalence represents the need for a change at a different level, perhaps focusing on the preconception stage and screening women of reproductive age for alcohol abuse patterns. Regardless of the screening measurement, FASD prevention requires a collaborative approach among all healthcare providers and agencies, the key factor could potently rely on education and further referral to specialized care those at risk of AEP.

The Clinical Question

The PICOT format describes the elements of a clinical question attempting to guide the research process. "P" stands for population, problem of study or interest; "I" stands for intervention or issue of interest; "C" stands for the comparison intervention or issue of interest; "O" stands for outcome of interest; and "T" stands for time frame for evaluation of an outcome (Melnyk & Fineout-Overholt, 2011).

This health system improvement project aims to answer the following question: In women of reproductive age (P), will implementing a standardized alcohol screening brief intervention and referral to treatment (SBIRT) program in primary care (I), identify alcohol use patterns in a vulnerable population that will aid in the overall prevention of fetal alcohol spectrum disorder (O)? No comparison will be utilized in this project. No time frame required for integrative review (T).

Purpose

The purpose of this population health improvement project is to perform a critical appraisal of the current evidence based literature regarding SBIRT alcohol screening among women of reproductive age in hopes of identify at risk behaviors, alcohol patterns, and/or vulnerability to an alcohol exposed pregnancy (AEP) in an attempt to reduce the incidence of FASD.

Literature Search Strategies

A comprehensive review of the literature was conducted using the Cumulative Index of Nursing and Allied Health Literature (CINAHL), PubMed, Google Scholar, CDC, and guidelines.gov. A combination of keywords were used to obtain current and relevant articles. These key terms included alcohol use, alcohol, substance use, screening, screening tools, women, women of reproductive age, female, childbearing, fetal alcohol spectrum disorder, fetal alcohol syndrome, SBIRT, pregnancy, and primary care. The inclusion criteria consisted of: Evidence based practice peer reviewed articles; articles addressing women of reproductive age and childbearing potential; English language; published between 2010-2017; alcohol use among women; and screening for alcohol use among women. One article by Floyd et al. dated 2007, was found during a primary reference review and was included in the appraisal as it contained relevant information regarding the clinical question. The exclusion criteria helped narrow the search results as it discarded studies with the following characteristic: Not peer-reviewed, studies that addressed alcohol screening in men or in women unable to conceive; and studies that include women over forty-four years of age. An exception was made with one study that include 13 of 30 participants over the reproductive age group selective for this review; however, 17of 30 participants met the criteria and the study was relevant to the clinical question.

After concluding the literature review, a vast variety of articles with different levels of evidence were available that included descriptive cohort studies, qualitative interviews, randomized controlled trials, cross-sectional surveys, and systematic reviews. A total of fifteen articles met criteria for data evaluation and analysis. Additional articles were selected to build the context that justified the importance of the study and its potential contribution to the advancement of patient care. The articles selected offered valid and reliable information to

support the background and significance, as well as the clinical question. No relevant articles were excluded due to the lack of articles related to the population of interest in this project and the application of the selected intervention.

Data Evaluation/Critical Appraisal

The fifteen selected articles were meticulously evaluated to determine their validity, reliability, and worth to practice. Each individual study was first appraised for type of design and level of evidence by using Dearholt and Dang (2012) levels of evidence pyramid (Figure 2 and Figure 3). This step subsequently determined the appropriate critical appraisal tool needed to support an unbiased, consistent evaluation of the literature across all studies in question. Figure 1 contains the various rapid critical appraisal tools used for this integrative project as listed in Melnyk and Fineout-Overholt (2015). The rapid critical appraisal tools for this project covered the following types of studies: qualitative evidence, evidence based guidelines, cohort studies, randomized control trials, and systematic reviews. The rapid critical appraisal tools helped ensure that the results of the study were valid, reliable, and applicable to advanced clinical practice (Melnyk & Fineout-Overholt, 2015). Evaluation tables were created to facilitate data evaluation (Table 1). The following headings were used in the evaluation table: Framework, Design/Method, Sample/Setting, Variables/Interventions, Measurement, Analysis, Level of Evidence/ Findings/ Worth to Practice. Only the findings that were relevant to the clinical questions were placed in the table as suggested by Melnyk & Fineout-Overholt (2011).

Data Analysis

The literature analysis and synthesis succeed the literature review. Once the rapid critical appraisal and evaluation tables for each study were completed, a decision was made regarding which study details and findings needed to be synthetized. The clinical question guided this

decision-making process. The findings from the fifteen valid, reliable, and applicable, research articles identified during the literature appraisal were combined to promote a new understating and provide a description of what is known and unknown about the subject in question. The fifteen studies were further clustered around aspects such as: Sample characteristics relevant to the clinical question, study design, intervention, and major findings pertinent to the clinical question (Table 2). The literature synthesis was used to build upon standards of care in practice (Gray et al., 2017). According to Melnyk and Fineout-Overholt (2015), the synthesis process combines and contrasts the major findings and provide the researcher with enough evidence to make an informed decision about what changes are important to improve healthcare outcomes.

Limitations

Two out of the 15 studies had small sample size, which limits the generalizability of the study findings to other populations. Three studies used interviews lasting from 30 to 180 minutes and due to interview fatigue, participants could have potentially answered what they thought the interviewer wanted to hear and not what they sincerely felt. Three studies used incentives for participation which could affect replicability of the studies. In two studies, participation was voluntary; thus, there was a potential that those who had heavy drinking behaviors refrained from participating, which could result in under-estimation of alcohol intake among these populations. Lastly, in six studies, data were self-reported and perhaps due to social stigma, pregnant women could potentially have had underreported their drinking patterns.

Strengths

The 15 studies selected for analysis addressed the clinical question using different approaches that include but are not limited to barriers, perspectives, and effectiveness of screening tools. The majority of the studies (13 out of 15) had adequate sample sizes, which

makes the sample more representative of the population of interest. The findings from all studies were recommended for advanced nursing practice due to the high quality of the evidence. According to Dearholt and Dang (2012), a quality A study provides consistent, generalizable results, with sufficient sample size for the study design, definitive conclusions, and consistent recommendations based on comprehensive literature review. Thirteen of 15 studies met the criteria for quality A and only three were quality B, which is also considered good evidence. No quality C studies were utilized for this integrative review.

Synthesis Themes

The analysis and synthesis of the literature yielded three common themes: Current alcohol screening tools used to identify alcohol behaviors among women; the use of SBIRT, Motivational Interviewing, and the healthcare providers and women's perceptions towards SBIRT; and risk factors associated with alcohol use and/or disclosure among women of reproductive age.

Alcohol Screening Tools

The literature supports the use of screening tools to identify women at risk for an alcohol-exposed pregnancy. The most common tools currently used are: TWEAK, Tolerance, Worried, Eye opener, Amnesia (blackouts), and K(C) cut down in relation to alcohol use; T-ACE (Tolerance, Annoyed, Cut down, and Eye opener); CAGE (Cut down, Annoyed, Guilt, Eye-opener); NET (Normal drinker, Eye-opener, Tolerance), AUDIT (Alcohol Use Disorder Identification Test), AUDIT-C (AUDIT-consumption); SMAST (Short Michigan Alcohol Screening Test); and a single binge drinking question (Balachova et al., 2015; Burns et al., 2010; Delrahim-Howlett et al., 2011; Floyd et al., 2007; Hettema et al., 2015; O'Connor et al., 2011; Rendall-Mkosi et al., 2013; Sarkar et al., 2010; Smith et al., 2014). The systematic

review analyzed found that for risk drinking, sensitivity was highest for T-ACE (69-88%), TWEAK (71–91%) and AUDIT-C (95%), with high specificity (71–89%, 73–83% and 85%, respectively). CAGE and SMAST performed poorly. Sensitivity of AUDIT-C at score ≥3 was high for past year alcohol dependence (100%) or alcohol use disorder (96%) with moderate specificity (71% each). For life-time alcohol dependency the AUDIT at score ≥8 performed poorly (Burns et al., 2010).

SBIRT, Motivational Interviewing, and Healthcare Providers and Women's Perceptions of SBIRT

A second theme found among the selected studies was the use of SBIRT and motivational interviewing (MI) as a means to intervene when alcohol patterns presented a risk for alcohol abuse with subsequent risk for AEP. Among treatment groups, self-reported risky drinking behavior was markedly decreased in the MI or brief intervention groups at the follow-up period and sustained at 12 months (Floyd et al., 2007; Hettema et al., 2015; Rendall-Mkosi et al., 2013). One particular study by Montag et al. (2015) found that assessment alone without the SBIRT intervention caused a decreased risky drinking and vulnerability to AEP. Although this study did not support SBIRT, it supported the necessity to provide screening and assessment among childbearing women to reduce AEP. In contrast, Delrahim-Howlett et al. (2011) and Sobell et al. (2017) found that brief interventions such as communicating risks for AEP and assessing alcohol consumption patterns among childbearing women may result in behavior changes and thus decreasing the incidence of AEPs.

In addition, the use of SBIRT appears to be hindered by providers perceptions as found in the following studies: Montag et al. (2015), Rendall-Mkosi et al. (2013), and Petersen et al. (2015). Findings in these studies suggested that there is a lack of a formal protocol or training,

when implementing SBIRT, to assist healthcare providers in dealing with alcohol and related risks. Regarding women's perceptions of SBIRT, there was a consensual positive attitude towards SBIRT services; furthermore, the majority of women reported no knowledge of risk factors associated with AEP or no advice for safe drinking limits from health care providers prior to the study (Hettema et al., 2015; Petersen et al., 2015).

Risk Factors for alcohol use and/or Disclosure

The third theme identified relates to the literature suggesting that programs to reduce AEP must go beyond conveying knowledge about FASD to address the contextual and social factors that lead women to drinking behaviors. The literature identified risk factors for alcohol use among women of reproductive age as follows: Depression was higher among alcohol users; women used alcohol to cope with stressors and negative emotions, including those associated with pregnancy; women drank to retain social connection; women lacked attachment to the pregnancy or were resistant to motherhood (Montag et al., 2017; Montag et al., 2015; O'Connor et al., 2011; Watt et al., 2014). The factors influencing women's decision to disclose alcohol use to a primary care provider (PCP) were primarily related to PCP behaviors encouraging or discouraging the disclosure. A positive relationship with PCPs encouraged disclosure (Cucciare et al., 2016). Literature findings emphasized on a more collectivistic approach that is cultural oriented. Alcohol screening through inclusion of relatives and friends could potentially promote motivation to reduce risky drinking. This approach, as opposed to a more individualistic perspective reflects the understanding that community members are part of a functioning, interdependent whole where the actions of one impacts the rest and peer support is important among certain communities. (Montag et al., 2015; Montag et al., 2017).

Implications

The literature reviewed concluded that FASD is completely preventable if pregnant women avoid alcohol consumption (Delrahim-Howlett et al., 2013; Bazzo et al., 2017; Green et al., 2016; Gupta et al., 2016; Larcher et al., 2014). There was also clear evidence of high rates of risky drinking among women of reproductive age with subsequent risk for AEP and correlation with FASD. In some of studies, women reported drinking alcohol post conception before pregnancy recognition and into the first trimester of pregnancy (O'Connor et al., 2011; Hettema et al., 2015; Smith et al., 2014). Despite women's willingness to discuss drinking patterns with their practitioners, the literature revealed that healthcare providers are not screening women for alcohol use, which could potentially be a contributing factor in the prevalence of FASD (Hettema et al., 2015; Montag et al., 2015).

Research also showed that any intervention regarding averting risky alcohol use among women of reproductive age creating awareness of FASD was better than no intervention at all in terms of decreasing the risk of AEP (Petersen et al. 2015; Montag et al., 2015; Smith et al, 2014; Cucciare et al., 2016). The use of current screening tools is beneficial to detect alcohol patterns among women. They are not consistently used among healthcare providers, especially in primary care where women commonly seek help. The literature lacks evidence regarding follow up for those identified at risk for AEP with the traditional screening tools (Smith et al., 2014; Rendall-Mkosi et al., 2010; Bazzo et al. (2017). As long as women of reproductive age continue to drink alcohol without an effective contraceptive method, there will always be a potential for an AEP with the result of FASD. This represents a need for more effective primary prevention and intervention programs aimed to reduce preconception alcohol use and improved utilization of contraceptive methods in this high-risk population (Delrahim-Howlett et al., 2013).

Recommendations

The current evidence-based literature evaluated during this integrative review strongly supported prevention of AEPs beginning before conception, by reducing alcohol consumption in women at-risk for or planning pregnancy, and/or preventing pregnancy in women who are drinking at risky levels (Hanson, Ingersoll, & Pourier, 2015; Velasquez et al., 2013; Delrahim-Howlett et al., 2013). This supports the need for the initiation of standardized alcohol use screening among women of reproductive age to avoid AEP, which then will avert FASD. Research emphasized that there is no known safe amount of alcohol use during pregnancy; thus, prevention of AEP is a priority among women of childbearing age (Montag et al., 2017). Literature proposed to approach prevention of FASD in ways such increasing awareness and knowledge of FASD, reducing risky drinking prior to pregnancy and prior to pregnancy recognition, avoiding alcohol consumption in pregnancy, and increasing the use of effective contraception. Efforts to prevent AEPs focus largely on delivering interventions in primary healthcare settings. Research recommends incorporating alcohol-screening tools into everyday practice in order to outreach problem drinkers whom are not actively looking for help, but seek healthcare for other reasons (Sakar et al., 2010). A valid recommendation from the literature was utilizing brief interventions such as SBIRT, an evidenced-based approach that incorporates feedback mechanisms which have been demonstrated to be the most effective treatment for alcohol abuse and misuse among persons who consume alcohol in excess of the recommended guidelines including reproductive-aged and pregnant women (Delrahim-Howlett et al., 2013; Montag et al., 2015; Rendall-Mkosi et al.,2013; Floyd et al., 2007; Hettema et al., 2015, & Petersen et al., 2015; Green et al., 2016). The National Institute on Alcohol Abuse and Alcoholism has recommended that a single binge drinking question (SBD) could be used to

screen people whose drinking puts them at risk of an alcohol problem as this simple intervention can effectively identify almost all at–risk women (Balachova et al., 2015). In addition, literature recommends addressing the contextual and social factors that lead women to drink during pregnancy as part of the screening (Watt et al., 2014)

Future Recommendations

This integrative review provides resounding support for the need to standardized SBIRT in primary care to screen women of childbearing age for alcohol use patterns as a starting point to decrease the incidence of AEP and FASD. The CDC offers the Planning and Implementing Screening and Brief Intervention for risky alcohol use, a step-by-step guide for primary care practices. This guide is designed to help healthcare providers adapt SBIRT into their practice. This guide walks providers through a series of steps required to plan, implement, and improve SBIRT as an element of standard practice. (CDC, 2014). However, further research is needed to incorporate studies that take into account several aspects identified as having a vital role in the prevalence of alcohol use among women of reproductive age placing them at risk for AEP. Personal perceptions regarding alcohol use and disclosure to PCP; lack of knowledge of FASD; health disparities among communities at high risk for AEP in order to comprehend cultural norms and community practices that could potentially place women at higher risk; depression and anxiety; contraceptive screening and counseling; and social support were all found to be pivotal for successful APE prevention.

Policy Initiatives

According to the National Organization on Fetal Alcohol Syndrome (NOFAS), the Alaska House bill 408 requires a healthcare provider who delivers or cares for a baby that has been determined to be affected by prenatal alcohol or other illegal substance exposure must

notify law enforcement. This bill does not address the necessity to identify risk for AEP by standardizing alcohol screening among women of reproductive age.

In 2014, the Alaska State Legislature proposed several pieces of legislation that include: rapid screening in the Department of Corrections for potential FASD risk and referral to treatment; creating citizen networks that promote positive community and social norms for prevention of FASD, and Empowering Hope, an initiate that encompasses awareness campaigns, support programs, residential substance abuse treatments, screening tools for FASD, and strategies that decrease AEP and also decrease the time between conception and recognition of pregnancies. NOFAS further stated that although policy and legislation regarding FASD is constructive, policy changes could increase stigma associated with maternal alcohol consumption and could potentially reduce the likelihood that a pregnant woman would disclose alcohol use to their PCP for fear of retribution. Thus, a policy that includes prevention may have a better opportunity to improve outcomes. Perhaps a future DNP project could recommend a policy initiative that encompass incorporating SBIRT as a standard of care among healthcare providers to screen for alcohol use patterns.

Conclusion

The above literature review provided enough evidence-based practice literature to build upon a body of knowledge that substantially addressed the proposed PICOT question. Research showed that several valid and reliable tools (AUDIT, AUDIT-C, TWEAK, T-ACE, and CAGE) have been evaluated and tested in women of reproductive age, with good results in identifying women at risk for alcohol misuse and potential AEP. Findings from these studies revealed that one tool is not more effective than others (Sarkar et al., 2010; Smith et al., 2014), and when followed by motivational intervention (Rendall-Mkosi et al., 2013) or brief intervention (Montag

et al., 2015) these screening tools become promising in terms of promoting a change of behavior among women at risk for or considered problem drinkers. In addition, these studies supported the necessity for healthcare providers to take the time to assess women, for alcohol use patterns, and offer immediate advice of the harm related to alcohol use during pregnancy while considering vital aspects such as barriers to disclosure (Cucciare et al., 2016) and/or underline depression (O'connor et al., 2011). The common denominator in most of these studies was the high rate of women at risk for AEP (Balachova et al., 2015; Burns et al., 2010; Floyd et al., 2007; Hettema et al., 2015; Montag et al., 2015; O'Connor et al., 2011; Rendall-Mkosi et al., 2013; Sarkar et al., 2010; Smith et al., 2014; Watt et al., 2014) proving the necessity for an immediate intervention in primary care such as SBIRT to prevent FASD. Alcohol screening and brief intervention is recommended for all adults, including pregnant women. This clinical service is effective, inexpensive, and can be accomplished in 6-15 minutes, although follow-up sessions might be needed (Green et al., 2016; CDC, 2016).

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Table 1

Evaluation Table

Full Citation: Sarkar, M., Einarson, T., & Koren, G. (2010). Comparing the effectiveness of TWEAK and T-ACE in determining problem drinkers in pregnancy. *Alcohol and alcoholism*, *45*(4), 356-360.						
Framework	Design/Method	Sample/Setting	Variables/ Interventions	Measurement	Analysis	Level of evidence/ Strength/Weakness Findings/Worth to Practice
The framework is not explicitly stated by authors in this study	Descriptive cohort study to test the qualities of widely used al alcohol screening tools, such as the TWEAK and T-ACE. Each patient was screened with both the TWEAK and the T-ACE questionnaire	Out of 202 eligible participants, a total of 175 women (87%) were included in the study. Pregnant women whom reported any alcohol consumption during pregnancy and at least 2 months prior were invited to participate in the study Setting: The Motherisk Alcohol and Substance Use Helpline, based at The Hospital for Sick Children in Toronto, Ontario, Canada.	No variables were manipulated in this study The study compared the effectiveness of the TWEAK and T-ACE screening tools in identifying problem drinking utilizing standard cut-off points that have been validated for screening, a comparison was done to determine if one test performed better than the other.	The TWEAK tool has been validated using cut-points (CP) of either two or three, depending on the population on which it is administered. While a CP score of two has been shown to be most effective in the population T-ACE was validated in. Cut point (CP). CP refers to the score used to define a positive screen: for this study, they used a CP of three or more for the TWEAK tool, and two or more on the T-ACE.	Scores were analyzed using the statistical software — SPSS (version 11.0). Chi-square analysis was used to determine differences in categorical variable between women who were identified as problem drinkers using the TWEAK and T-ACE tools compared to those who were not (non-problem drinkers). Student t-test and/or Mann–Whitney U-test was used to compare continuous data such as sensitivity and specificity rates between the TWEAK and T-ACE tools.	Level: III Quality: B Strength: Participants voluntarily self-reported alcohol use; thus, there was minimal concerns for underreporting alcohol patterns. Weakness: The sample is not representative of all pregnant women as it was limited to only those whom called the helpline. The TWEAK and T-ACE tools both performed similarly at identifying potential at-risk women.

Full Citation: Burns, E., Gray, R., & Smith, L. A. (2010). Brief screening questionnaires to identify problem drinking during pregnancy: a systematic review. *Addiction, 105*(4), 601-614.						
Framework	Design/ Method	Sample/Setting	Variables/ Interventions	Measurement	Analysis	Level of evidence/ Strength/Weakness Findings/Worth to Practice
No framework	Systematic Review	Five studies (6724 participants) were included. In total, seven instruments were evaluated: TWEAK (Tolerance, Worried, Eye-opener, Amnesia, Kut down), T-ACE [Take (number of drinks), Annoyed, Cut down, Eye-opener], CAGE (Cut down, Annoyed, Guilt, Eye-opener], NET (Normal drinker, Eye-opener, Tolerance), AUDIT (Alcohol Use Disorder Identification Test), AUDIT-C (AUDIT-consumption) and SMAST (Short Michigan Alcohol Screening T est	The study included cohort or cross-sectional studies that compared one or more brief alcohol screening questionnaire(s) with an appropriate reference standard for risk drinking	This systematic review measured high risk drinking using the mentioned alcohol screening tools	For each study, sensitivity, specificity, and positive predictive value were either extracted from the study or calculated from the data	Level: I Quality: A Strength: Strong level and quality of evidence, applicability to practice. Weakness: Uncertainty as to how the tools would perform in different populations of women, as they were all conducted in the US, and in two the participants were socially disadvantaged. This systematic review found that TWEAK, T-ACE and AUDIT-C had the highest sensitivity for identifying prenatal risk drinking. Sensitivity values indicate that about seven to nine of 10 risk drinkers would be identified correctly using one of these brief questionnaires CAGE and SMAST performed poorly.

Full Citation: Petersen Williams, P., Petersen, Z., Sorsdahl, K., Mathews, C., Everett-Murphy, K., & Parry, C. D. (2015). Screening and brief interventions for alcohol and other drug use among pregnant women attending midwife obstetric units in Cape Town, South Africa: a qualitative study of the views of health care professionals. *Journal of Midwifery & Women's Health, 60*(4), 401-409.						
Framework	Design/Method	Sample/Setting	Variables/ Interventions	Measurement	Analysis	Level of evidence/ Strength/Weakness Findings/Worth to Practice
This study was guided by the consolidated framework for implementation research which identifies 5 domains: 1-characteristics of the intervention 2- the outer setting 3- the inner setting 4- characteristics of individuals providing the intervention 5- the process of implementation or support needed to deliver services	Qualitative interviews An open-ended, semi structured interview schedule guided the interviews and were designed to identify factors that hinder or support the implementation of SBIRT for substance use in these settings. Interviews were conducted within a space of 2 months from August to September 2011 and lasted from 40 minutes to an hour.	All nursing and counseling staff working at the 2 midwife obstetric units, and those who would potentially be involved in or affected by the implementation of an intervention, were invited to participate in the research Participants constituted Forty-three female health care providers at 2 public sector midwife obstetric units in Cape Town, South Africa	No variables were manipulated The study investigated the health care providers' perceptions of the acceptability and feasibility of providing SBIRT to address substance use among pregnant women attending antenatal care in South Africa	There were measurements related to the demographic characteristics of the staff selected such as: age, race, job description, years of experience,	Interviews were transcribed verbatim. The interviews were qualitatively analyzed using the framework approach The 2 researchers involved in the analysis of the data did so independently and then came to an agreement on the coding list. The analysis was concluded when they reached an agreement on the interpretation of the data	Level: III Quality: A Strength: Framework consistent with the study, applicability to practice. Weakness: Sample was limited to staff at only 2 midwife obstetric units and the findings may not represent the views of health care personnel more broadly -Study findings suggest that there is a lack of a formal protocol to assist providers in dealing with alcohol and other drug use and related risks - Participants identified certain barriers that need to be considered when implementing SBIRT for substance use such as: patients' non-disclosure, staff attitudes, lack of training, language barriers, and staff shortages

Full Citation: Montag, A. C., Brodine, S. K., Alcaraz, J. E., Clapp, J. D., Allison, M. A., Calac, D. J., ... & Chambers, C. D. (2015). Preventing Alcohol-Exposed Pregnancy Among an American Indian/Alaska Native Population: Effect of a Screening, Brief Intervention, and Referral to Treatment Intervention. *Alcoholism: Clinical and Experimental Research*, *39*(1), 126-135.						
Framework	Design/Method	Sample/ Setting	Variables/ Interventions	Measurement	Analysis	Level of evidence/ Strength/Weakness Findings/Worth to Practice
The framework is not explicitly stated by authors in this study	This is a randomized controlled trial (RCT) Southern California AIAN women of childbearing age who completed a survey including questions regarding alcohol consumption and contraceptive use were randomized into intervention or treatment as usual groups where the former group completed an online SBIRT intervention, and were followed up at 1, 3, and 6 months post intervention	A total of 263 AIAN women from 18 to 45 years of age, of childbearing potential, recruited from 1 of 3 AIAN health clinics located in Southern California between April 2011 and September 2012.	Dependent: American Indian/Alaska native (AIAN) women Independent: SBIRT intervention This study attempted to determine whether a culturally targeted Screening, Brief Intervention, and Referral to Treatment (SBIRT) intervention may reduce risky drinking and vulnerability to AEP among American Indian/Alaska Native (AIAN) women in Southern California.	The "Vulnerability to Alcohol-Exposed Pregnancy" variable was defined in 2 categories: not at high risk and at high risk. Being "at high risk" for an AEP was defined as currently drinking 3 or more standard drinks per occasion and/or 8 or more standard drinks per week and using a less than a highly effective contraceptive method. "binge" or "risky" drinking was 3 or more standard drinks per occasion and/or 8 or more drinks per week	Comparisons were conducted using *t*-tests (continuous), chi-square (dichotomous), Fisher's exact test (dichotomous with small cell sizes), and nonparametric analyses (for data not normally distributed and not transformed). Analysis of variance (ANOVA) was used to examine associations among population characteristics. The vulnerability to AEP outcome variable was tested as dichotomous ("at high risk" vs. "not at high risk") Change over time analyses were conducted in 2 ways: using only the subjects available at all follow-ups and multiple imputation methods	Level: I Quality: A Strength: The SBIRT intervention tool was adapted to meet the literacy of these communities. Weakness: the participants were volunteers; thus, it is unknown of how representative they are of the entire population This study reiterates the importance of providing assessment to women of childbearing age, even if time constraints prevent an accompanying intervention. Furthermore, the study supports targeted interventions for AIAN women who currently drink alcohol that incorporate efforts to shift cultural norms, recognition of depression, and assessment of alcohol consumption and vulnerability to AEP.

Full Citation: Smith, L., Savory, J., Couves, J., & Burns, E. (2014). Alcohol consumption during pregnancy: cross-sectional survey. *Midwifery*, *30*(12), 1173-1178.						
Framework	Design/ Method	Sample/ Setting	Variables/ Interventions	Measurement	Analysis	Level of evidence/ Strength/Weakness Findings/Worth to Practice
The framework is not explicitly stated by authors in this study	Cross-sectional Women were recruited before their booking appointment with the midwife so they could obtain information on alcohol intake before women had potentially received information and advice to abstain.	Participants were women aged 18 and over who attended either clinic for their initial antenatal appointment (10-11 weeks gestation) for blood tests and ultrasound scan Of the 505 women eligible, 470 (93%) agreed to participate in the study, and 409 returned their questionnaires Setting: two antenatal clinics in the South West of England.	No variables were manipulated Women, at the selected clinics, were handed a sequentially numbered envelope containing all study materials by a receptionist or maternity support worker on arrival at the clinic. Completed questionnaires were returned in a sealed envelope either into a designated collection box in reception, or via post back to the clinic. The questionnaire, only contained anonymized data.	The Alcohol Use Disorders Identification Test (AUDIT) is a 10-item questionnaire asking about alcohol consumption. Possible scores range from 0 to 40, and a score of eight or more indicates potential hazardous drinking, 16–19 indicates potential harmful drinking, and a score of 20 or more indicates potential alcohol dependence AUDIT-C is an abbreviated version with only the first three questions T-ACE is the first validated alcohol tool for peri-conception risk drinking The recommended scores for identification of risk drinking is two or more for T-ACE, and three or more for AUDIT-C	Respondents were compared with non-respondents with respect to Index of Multiple Deprivation (IMD) scores and were compared using the Mann–Whitney test, whilst X2tests were used to compare ethnicity, age group, gestation and parity. They examined if age, ethnicity, parity, gestation and IMD scores were independently associated with drinking during early pregnancy. All predictors were entered into a multivariable binary logistic regression model. Statistical significance was set at po0.05. the sample size of 409 returned questionnaires provided estimates within 2% for variables with prevalence of 5% and within 1.4% for variables with a prevalence of 2%. Data were analyzed using SPSS v17.	Level: III Quality: A Strength: Sample was representative of the population of interest. Weakness: Participation was voluntary; thus, there was a potential that those who had heavy drinking behaviors refrained from participating, which could result in under-estimation of alcohol intake among these populations This study revealed that the use of screening tools is beneficial to detect alcohol patterns among women.

Full Citation: Cucciare, M. A., Lewis, E. T., Hoggatt, K. J., Bean-Mayberry, B., Timko, C., Durazo, E. M., ... & Frayne, S. M. (2016). Factors affecting women's disclosure of alcohol misuse in primary care: a qualitative study with US Military veterans. *Women's health issues*, *26*(2), 232-239.						
Framework	Design/ Method	Sample/Setting	Variables/ Interventions	Measurement	Analysis	Level of evidence/ Strength/Weakness Findings/Worth to Practice
The Consolidated Framework for Implementation Research (CFIR) Three CFIR domains were used to guide the interview: 1) Characteristics of providers involved in the patient–provider interaction 2) The outer setting, which includes patients' social or economic factors that can affect the effectiveness of a clinical strategy, and 3) the inner setting, which includes features of the clinic (i.e., structure, cultural context)	Qualitative interview Eligible women completed a 45- to 60-minute, semi structured telephone interview and were reimbursed $60 for their time. Data on all participants were also abstracted from the VA's medical record.	Participants were recruited through study flyers provided to them by a primary care provider (PCP) or posted in clinics. Women veterans were eligible to participate if they answered "yes" to questions about whether they had discussed, with their PCP, their alcohol consumption during a routine visit within the prior year, and had consumed alcohol in the past year. A total of 30 women veterans met eligibility and were recruited between October 2012 and May 2013. Setting: Two VA Women's Health primary care clinics in California	No variables were manipulated Before the interview, participants were made aware that the focus of the study was to understand women's experiences disclosing alcohol use to their PCP and to obtain their preferences for alcohol-related care options.	Demographic and clinical characteristics were measured: Age, race & ethnicity, marital status, employment status. The study identified nine common themes representing factors that influence women's decision to disclose alcohol use to a PCP such as: provider behaviors perceived as encouraging or discouraging disclosure of alcohol misuse, perceived positive relationship with provider, negative emotions of being judged or labeled an "alcoholic," health concerns about drinking, non-health related concerns, social support, clinic factors, and self-appraisal of drinking behavior.	All interviews were audio recorded, transcribed verbatim by a medical transcription company, and reviewed for accuracy by the interviewer. Data analysis procedures were guided by template analysis, a methodology for identifying themes in textual data.	Level: III Quality: B Strength: Diversity of the sample and relevant to question. Weakness; sample may have been overrepresented by women who feel more comfortable discussing alcohol use with staff This study demonstrated the importance of social relationships, comfort with PCPs, in order to support alcohol misuse disclosure among women during primary care visits. This study also supports the provision of brief alcohol counseling in primary care clinics as a standard of care.

Full Citation: Watt, M. H., Eaton, L. A., Choi, K. W., Velloza, J., Kalichman, S. C., Skinner, D., & Sikkema, K. J. (2014). "It's better for me to drink, at least the stress is going away": Perspectives on alcohol use during pregnancy among South African women attending drinking establishments. *Social Science & Medicine (1982), 0,* 119–125. http://doi.org/10.1016/j.socscimed.2014.06.048						
Framework	Design/ Method	Sample/Setting	Variables/ Interventions	Measurement	Analysis	Level of evidence/ Strength/Weakness Findings/Worth to Practice
The framework is not explicitly stated by authors in this study	Qualitative interviews. The study used In-depth interviews with open ended questions lasted 60– 90 minutes and were audio-recorded. Participants were given a grocery card in the value of 100 Rands (approximately US $10) as compensation for their time.	Eligibility criteria: at least 18 years old; currently pregnant or gave birth in the last year; and reported any alcohol consumption during the pregnancy period, including the period prior to pregnancy. Sample: The sample included nine women who were pregnant at the time of the interview and 15 women who were within 12 months postpartum recruited between April and August 2013. Setting: Women from Delft, a peri-urban township located 15 miles from the center of Cape Town, South Africa.	No variables were manipulated in this study. At the end of the interview, women were told about the risks of drinking during pregnancy, and were referred to appropriate substance use, mental health and prenatal services in the community.	Five primary themes/ factors that contributed to drinking during pregnancy were identified: 1) women used alcohol to cope with stressors and negative emotions, including those associated with pregnancy; 2) women drank to retain social connection; 3) social norms in women's peer groups supported drinking during pregnancy; 4) women lacked attachment to the pregnancy or were resistant to motherhood; and 5) women were driven physiologically by alcohol addiction.	Audio-recordings of the interviews were transcribed and simultaneously translated into English. Analytic memos that included relevant quotations (to reflect women's own words) were used to organize the transcripts into main themes. The memos were uploaded to a qualitative analysis software program (NVivo 10), and coded for text related to each of the identified themes.	Level: III Quality: A Strength: This study utilized appropriate statistical methods to support accuracy of data analysis. Weakness: The sample was restricted to heavy drinkers and women who had some connection to the study venues. The study suggests a necessity to address the contextual and social factors that lead women to drink during pregnancy. Mental health played a vital role in the desire to drink alcohol; therefore, interventions that address distress and ways to develop coping skills, among women, could potentially decrease their desire to drink. Brief intervention and contraception to prevent unwanted pregnancies is an important factor to consider among women of reproductive age.

Full Citation: O'Connor, M. J., Tomlinson, M., LeRoux, I. M., Stewart, J., Greco, E., & Rotheram-Borus, M. J. (2011). Predictors of alcohol use prior to pregnancy recognition among township women in Cape Town, South Africa. *Social Science & Medicine, 72*(1), 83-90.						
Framework	Design/ Method	Sample/ Setting	Variables/ Interventions	Measurement	Analysis	Level of evidence/ Strength/Weakness Findings/Worth to Practice
Social Action Theory This theory underlines social interdependence in personal control of health-endangering behaviors. It also emphasizes that environmental, psychological, and problem-solving activities are important to effect sustained behavioral change	Cross-sectional design Assessment interviews were conducted in Xhosa or English, depending on the participant's primary language preference. Interviews lasted on average between 33 and 181 min, with a mean of 60 min (SD 1⁄4 13.00).	619 pregnant Black/African women between the ages of 18 and 41 years. Setting: The study site was located in 24 neighborhoods in the Cape Flats outside Cape Town, South Africa	Variables predicting risk for post conception prior to pregnancy recognition drinking: Mother's age; Single vs. married/living together; Sum: water, electricity, flush toilet; Use Tobacco; Number of lifetime partners; Partner violence; Weeks pregnant at pregnancy recognition. No interventions, rather the researchers used screening tools to collect data.	194-item questionnaire included sections measuring participant demographics, housing demographics, reproductive health (HIV/AIDS and STIs), mental health of the mother, substance use post conception prior to pregnancy recognition, HIV/AIDs disclosure, sexual behavior, and partner violence. Derived AUDIT-C; used for alcohol screening. The Edinburgh Postnatal Depression Scale (EPDS) was used to assess depressive symptoms in sample women	Data analysis was conducted using SAS software version 9.2 to compare groups. Comparison of groups used independent sample t tests and chi-square analyses. Data were then subjected to simple logistic regression analysis to determine whether there were statistically significant ($p < .05$) bivariate associations between each predictor and the outcome drinking variable.	Level: III Quality: A Strength: Results were consistent with other studies performed in South Africa suggesting that the findings may be applicable to other populations. Weakness: Use of self-report measures to assess alcohol consumption which could suggest the probability of underreporting 68% of women who reported drinking during pregnancy also reported high levels of depressive symptoms, in contrast to 57% of women who were not drinking. The decision of drinking prior to pregnancy recognition was influenced by being younger, single, having better living conditions, smoking, having a longer gestation prior to pregnancy recognition, having a great number of sexual partners and a higher incidence of intimate partner violence.

Full Citation: Rendall-Mkosi, K., Morojele, N., London, L., Moodley, S., Singh, C., & Girdler-Brown, B. (2013). A randomized controlled trial of motivational interviewing to prevent risk for an alcohol-exposed pregnancy in the Western Cape, South Africa. *Addiction*, *108*(4), 725-732.						
Framework	Design/Method	Sample/Setting	Variables/ Interventions	Measurement	Analysis	Level of evidence/ Strength/Weakness Findings/Worth to Practice
The framework was not explicitly stated by the researchers in this study.	Randomized controlled trial The study was conducted in 2007–08 to determine the impact of the MI intervention on the risk of an AEP at 3 and 12 months follow-up (primary outcome measure) and on risky drinking and ineffective contraception use (secondary outcomes) in non-pregnant high-risk women at 3 and 12 months	Sample**:** A total of 165 women aged 18–44 years at risk of alcohol exposed pregnancy. Setting**:** Rural population in the Western Cape, South Africa.	IV: Motivational interviewing (MI) DV: Alcohol exposed pregnancy (AEP) The intervention consisted of Five-session motivational interviewing (MI)	Structured questionnaires were administered pre-intervention and at 3 and 12 months follow-up. The primary outcome measure was AEP at 12 months. Secondary outcomes were AEP at 3 months, and alcohol use and effective contraception at 3 and 12 months	Data analysis was done by STATA version 12. The *Z*-test normal approximation method for large samples was used to estimate the 95% CIs and *P*-values for the differences between proportions. Where ORs were estimated, the exact 95% CIs have been used. These ORs were estimated without adjustment for covariables, as the number of covariables for which we had information was large relative to the sample size, and there was a great deal of correlation Intention-to-treat, or ITT analysis was used for AEP. Wilcoxon rank-sum test was used to compare changes among MI and control groups.	Level: I Quality: A Strength: Large sample size and the randomization process which makes the sample more representative of the population of interest. Weakness: The incentive for participation could affect replicability of the study There was a significant difference in the decline in the proportion of women at risk for an AEP in the MI group at 3 months (50 versus 24.59%; $P = 0.004$), maintained at 12 months (50.82 versus 28.12%; $P = 0.009$). The odds ratio for no longer being at risk of an AEP (MI versus control) at 12 months was 2.64

Full Citation: Floyd, R. L., Sobell, M., Velasquez, M. M., Ingersoll, K., Nettleman, M., Sobell, L., ... & Skarpness, B. (2007). Preventing alcohol-exposed pregnancies: a randomized controlled trial. *American journal of preventive medicine*, *32*(1), 1-10.						
Framework	Design/ Method	Sample/Setting	Variables/ Interventions	Measurement	Analysis	Level of evidence/ Strength/Weakness Findings/Worth to Practice
N/A	This study was a two-group parallel Randomized control trial (RCT) This study used a brief motivational intervention to reduce the risk of an alcohol-exposed pregnancy (AEP) in pre-conceptional women by focusing on both risk drinking and ineffective contraception use.	A total of 830 non-pregnant women, aged 18–44 years, and currently at risk for an AEP were recruited in six diverse settings in Florida, Texas, and Virginia Recruitment was from July 1, 2002 to January 30, 2004, and the follow-up period ended August 15, 2005 Settings included jails, drug and alcohol treatment centers, suburban primary care practices, a hospital-based gynecology clinic, a Medicaid health maintenance organization, and a media-recruited sample	DV: Alcohol-exposed pregnancies Nominal variables: race, gender, marital status, education, and income Participants were randomized to receive information plus a brief motivational intervention (*n* 416) or to receive information only (*n* 414). The brief motivational intervention consisted of four counseling sessions and one contraception consultation and services visit	Women consuming more than five drinks on any day or more than eight drinks per week on average, were considered risk drinkers; women who had intercourse without effective contraception were considered at risk of pregnancy. Reversing either or both risk conditions resulted in reduced risk of an AEP	Fisher's exact tests used on nominal variables Group means on the age variable, AUDIT score, number of drinks, and number of binge episodes were compared using a Satterthwaite *t* test Intent-to-treat analysis of outcome measures was performed on all randomized participants in the intervention group (*n* 416) and in the control group (*n* 414) Odds ratios (ORs) and regression coefficients were computed using SAS for each outcome measure: AEP, drinking, and contraception use	Level: I Quality: A Strength: Strong level and quality of evidence, applicability to practice. Weakness: Number of participants lost to follow-up by 9 months. Across the follow-up period, the odds ratios (ORs) of being at reduced risk for AEP were two-fold greater in the intervention group: 3 months, 2.31 (95% confidence interval [CI] 1.69–3.20); 6 months, 2.15 (CI 1.52–3.06); 9 months, 2.11 (CI 1.47–3.03). Between-groups differences by time phase were 18.0%, 17.0%, and 14. 8%, respectively A brief motivational intervention can reduce the risk of an AEP.

Full Citation: Hettema, J., Cockrell, S., Russo, J., Corder-Mabe, J., Yowell-Many, A., Chisholm, C., & Ingersoll, K. (2015). Missed opportunities: screening and brief intervention for risky alcohol use in women's health settings. *Journal of Women's Health*, *24*(8), 648-654.						
Framework	Design/ Method	Sample/Setting	Variables/ Interventions	Measurement	Analysis	Level of evidence/ Strength/Weakness Findings/Worth to Practice
None	Descriptive study Women completed a voluntary, self-administered survey on ‘‘lifestyle issues that impact women’s health.’’ Patients completed the surveys in the waiting room before their scheduled appointment	Participants were a convenience sample 18 years or older female patients seen between July and October 2012. A total of 199 patients met inclusion criteria and completed the survey Setting: 13 Virginia State Department of Health (VDH) public clinics providing women’s health services in two central Virginia health districts	No variables were manipulated in this study No interventions, rather the researchers used screening tools to collect data regarding rates of risk behaviors, receipt of SBIRT components, and patient attitudes towards receipt of services in these settings, in order to determine the suitability of these settings for SBIRT.	(1) Alcohol use and contraception behavior. (2) Receipt of SBIRT services (3) Attitudes toward receipt of SBIRT services. (4) Demographics and background information	The statistical software package SPSS 21 (SPSS Inc.) was used for all data analyses. Descriptive statistics: frequencies, means, and standard deviations were used to analyze all survey data. Pearson chi-square tests were used to analyze differences between self-reported non-receipt of SBIRT services by race/ethnicity and language.	Level: III Quality: A Strength: Use of valid and reliable single question screening tools that reduce the amount of time spent in answering the survey. Weakness: Data were self-reported and rates may not accurately represent women’s behavior. Patients at risk for AEP reported that their medical provider did not discuss risk factors of AEP. Patient attitudes towards receipt of SBIRT services were favorable; more than 90% of women agreed or strongly agreed that if their drinking was affecting their health, their women’s health provider should advise them to cut down. Women’s health clinics may be an ideal setting to implement SBIRT

Full Citation: Balachova, T., Sobell, L. C., Agrawal, S., Isurina, G., Tsvetkova, L., Volkova, E., & Bohora, S. (2015). Using a single binge drinking question to identify russian women at risk for an alcohol-exposed pregnancy. *Addictive Behaviors, 46,* 53-57. doi:10.1016/j.addbeh.2015.03.003						
Framework	Design/ Method	Sample/Setting	Variables/ Interventions	Measurement	Analysis	Level of evidence/ Strength/Weakness Findings/Worth to Practice
None	Descriptive study Participants were 689 non-pregnant Russian women of childbearing age who were at AEP risk. Their answers to Single Binge Drinking (SBQ) question, "During the previous three months, how often did you have four or more drinks on one occasion", were compared with their reports of binge drinking on a 90-day Timeline Followback (TLFB) calendar.	Women of child-bearing age (18–44 years old) who were fertile currently were not pregnant by self-report; living in the area served by one of the study clinics; gave voluntary informed consent for the study; were available for follow-up for 12 months; and engaging in AEP risk behaviors de-fined as: used no or ineffective contraceptive methods, and over the 90 days prior to the interview had either consumed an average of ≥8 standard drinks per week or had engaged in binge drinking (i.e., ≥ 4 standard drinks in one day) Study participants were recruited at public women's clinics in two locations in Russia	A 40-minute face-to-face structured assessment interview was conducted with each participant by female graduate psychology students trained and supervised by PhD level psychologists. The assessment interview included demographic questions (e.g., age, education, gender, and marital status), and assessment of alcohol use behavior, including the Timeline Followback (TLFB	The SBD question was part of the Quick Drinking Screen (QDS), a short self-report summary measure that contains four questions about alcohol use including one question on binge drinking (i.e., ≥4 drinks on at least one occasion). The interval for all questions on the QDS including the binge drinking questions was 90 days ("During the previous three months, how often did you have four or more drinks on one occasion?"), the same interval as for the TLFB. Based on current guidelines any confirmative answer (i.e., any frequency of binge drinking) was considered as at-risk drinking for an AEP.	Women who self-reported ≥ 4 drinks on at least one occasion (i.e., binge drinking) on the SBQ and on the 90- day TLFB calendar were considered at risk of an AEP. Answers to any binge drinking on the SBQ and the TLFB were coded as at-risk drinking (i.e., Yes binge drinking) or not at risk (i.e., No binge drinking).	Level: III Quality: B Strength: Large sample size and cross-cultural replication of a SBD question to identify Russian women at risk of an AEP. Weakness: Participants' reports were not corroborated with another data source. A single binge drinking question can effectively identify almost all at-risk women. Therefore, it is recommended that it be incorporated into routine health care screenings by physicians and at OB/GYN clinics. The National Institute on Alcohol Abuse and Alcoholism has recommended that SBD question can be used to screen people whose drinking puts them at risk of an alcohol problem.

Full Citation: Montag, A. C., Dusek, M. L., Ortega, M. L., Camp-Mazzetti, A., Calac, D. J., & Chambers, C. D. (2017). Tailoring an alcohol intervention for American Indian Alaska native women of childbearing age: Listening to the community. *Alcoholism: Clinical and Experimental Research, 41*(11), 1938-1945. doi:10.1111/acer.13485						
Framework	Design/Method	Sample/Setting	Variables/ Interventions	Measurement	Analysis	Level of evidence/ Strength/Weakness Findings/Worth to Practice
N/A	Interviews/ Focus groups Focus group sessions and interviews were conducted face-to-face and were audio-recorded. There were 4 to 6 participants in each focus group which was conducted sitting in a circle (a talking circle). Focus groups lasted 60 to 120 minutes. They often took place at lunch time in which case food was provided.	There were 10 focus groups (n = 54) and 3 key informant interviews. Of the 57 participants, 48 were American Indians (AI) and 37 were AI women of childbearing age. There were 6 focus groups composed of local Native women of childbearing age, 1 focus group included only elders, 1 included elders and community leaders, and 2 included relevant staff from participating health clinics.	The intervention consisted of a single face-to-face intervention session assessing each participant's risk and readiness to change, providing personalized feedback regarding risk, alcohol consumption comparisons with community social norms, and encouraging motivation to change through exploring discrepancies between their own behaviors and their values and goals. The intervention would be embedded in a SBIRT study with a baseline, paper and pencil, questionnaire, and follow-up phone calls at 1, 3, and 6 months	Using focus groups and interviews, the authors modified a web-based SBIRT intervention into a culturally congruent peer-to-peer MI-based SBIRT intervention with the goal of decreasing risky drinking by women of childbearing age	Audio recordings were transcribed by 2 team members and coded Themes were collapsed into 6 major categories*:* Making the intervention understandable, Making the intervention relevant, Making the intervention culturally appropriate, assessing alcohol consumption, assessing why women drink, and Assessing why women don't drink.	Level: III Quality: A Strength: Diverse group of participants, representative of the community Weakness: Portions of the focus groups recordings could not be clearly heard necessitating the use of notes. Data was coded by only one person This study emphasized on a more collectivistic approach, through inclusion of relatives and friends in assessment and in the motivation to reduce risky drinking. This approach, as opposed to a more individualistic perspective which dominates Western societies, reflects the understanding that community members are part of a functioning, interdependent whole where the actions of 1 impact the rest.

Full Citation: Sobell, L. C., Sobell, M. B., Johnson, K., Heinecke, N., Agrawal, S., & Bolton, B. (2017). Preventing Alcohol-Exposed pregnancies: A randomized controlled trial of a Self-Administered version of project CHOICES with college students and nonstudents. *Alcoholism: Clinical and Experimental Research*, *41*(6), 1182-1190. doi:10.1111/acer.13385						
Framework	Design/Method	Sample/Setting	Variables/ Interventions	Measurement	Analysis	Level of evidence/ Strength/Weakness Findings/Worth to Practice
N/A	Randomized Control Trial Compared two interventions: Motivational feedback and information only	Blocked randomization resulted in 145 students and 209 nonstudents assigned to the following groups: student, Motivational Feedback (MF) (*n* = 72); student, Information Only (IO) (*n* = 73); nonstudent, MF (*n* = 108); and nonstudent, IO (*n* = 101). Participants who completed and returned their assessment materials received a $20 check for their participation.	After returning their informed consent and assessment materials, participants were blocked on student status (student, nonstudent) and randomly assigned to 1 of 2 interventions: information only (IO; *n* = 174) or motivational feedback (MF; *n* = 180)	The assessment included the following: demographic questions; detailed inquiry about birth control practices; and ratings *at the present time* of changing 2 behaviors (i.e., "*to not become pregnant*," "*to reduce alcohol use*") on a 5-point importance rating scale (1 = not, 2 = slightly, 3 = somewhat, 4 = very, 5 = extremely).	At the start of the study, all participants were at risk of an AEP. At the follow-up, risk was evaluated dichotomously for the entire 6-month interval as: *At risk* if a woman had engaged in any risky drinking and/or ineffective or no contraception; Not at risk if a woman reported no risky drinking or contracepting effectively, or both. Even 1 binge drinking day (i.e., ≥5 SDs) without effective birth control would constitute an at-risk day and result in women being classified as at-risk over the 6 months.	Level: I Quality: A Strength: Large and diverse sample size, 92% follow up rate. Weakness: Results were limited to a 6-month interval This study strongly suggests that the most effective AEP prevention strategy is to simply communicate to those women at risk that they could become pregnant The results of this study suggest that disseminating low-cost, informational brochures to prevent AEPs in settings where women seek services for preventive or routine health care could help achieve the CDC's *Healthy People 2020* objective of mitigating the risk of AEPs among women of childbearing age

Full Citation: Delrahim-Howlett, K., Chambers, C. D., Clapp, J. D., Xu, R., Duke, K., Moyer, R. J., & Van Sickle, D. (2011). Web-Based assessment and brief intervention for alcohol use in women of childbearing potential: A report of the primary findings. *Alcoholism: Clinical and Experimental Research, 35*(7), 1331-1338. doi:10.1111/j.1530-0277.2011.01469.x						
Framework	Design/Method	Sample/Setting	Variables/ Interventions	Measurement	Analysis	Level of evidence/ Strength/Weakness Findings/Worth to Practice
N/A	Randomized Control Trial Web-based alcohol assessment and intervention tool	Participants were 150 nonpregnant risky drinking women who were recruited from 3 separate Women Infant and Children (WIC) Special Supplemental Nutrition Clinics in San Diego County	Variables included age, race/ethnicity, education level, marital status, other drug use, contraceptive use and method, illicit drug use, tobacco use, family history of alcohol use disorders, age of first alcohol use, number of living children, and number of pregnancies. Follow-up consisted of telephone-based assessment of current drinking at 1 and 2 months post-baseline assessment and intervention.	Demographic and health behavior characteristics were assessed for all participants. Alcohol consumption at baseline was measured for all participants. Each participant was asked to report the number of days in the past month on which they consumed ≥3 drinks containing alcohol The T-ACE (Tolerance, Annoyed, Cut Down, Eye-Opener) screening instrument was used to assess the level of risky drinking behavior in the past year for all participants, with T-ACE positive defined as a score of 2 points or greater	*t*-Tests (for continuous variables), chi-squared tests (for dichotomous variables), Fisher's exact tests (for dichotomous variables of small cell sizes), and nonparametric analyses (for non-normal distributions) were used to test for equivalence between groups. Plots and examination of skewness and kurtosis were used to identify evidence of non-normality for continuous variables	Level: I Quality: A Strength: Adequate sample size, study is relevant to clinical question Weakness: Participants were predominantly Latina and Caucasian, findings may be difficulty to replicate Findings suggest that simply assessing a behavior may result in a change in that behavior. Detailed and interactive assessments of alcohol consumption may be sufficient for the reduction of risky drinking within this population without personalized feedback. Primary prevention in risky drinking women prior to conception is the optimum intervention for FASD

Table 2
Synthesis Table

Study Author	Year	Number of participants	Sample characteristics relevant to the clinical question	Study Design	Intervention	Major findings pertinent to the clinical question
Sarkar, Einarson, & Koren	2010	175 women	Pregnant women whom reported any alcohol consumption during pregnancy and at least 2 months prior were invited to participate in the study	Descriptive cohort study	Comparison of the effectiveness of the TWEAK and T-ACE screening tools in identifying problem drinking in pregnancy	The TWEAK and T-ACE tools both performed similarly at identifying potential at-risk women There was no statistical difference in the effectiveness for one test performing better
Burns et al.	2010	Five studies (6724 participants)	The studies selected for this systematic review attempted to investigate the sensitivity, specificity and predictive value of brief alcohol screening questionnaires to identify problem drinking in pregnant women.	Systematic review	Cohort or cross-sectional studies that compared one or more brief alcohol screening questionnaire(s) with an appropriate reference standard for risk drinking	T-ACE, TWEAK and AUDIT-C show promise for screening for risk drinking, and AUDIT-C may also be useful for identifying alcohol dependency or abuse. However, their performance as stand-alone tools is uncertain, and further evaluation of questionnaires for prenatal alcohol use is warranted
Petersen Williams et al.	2015	43 female health care providers	All nursing and counseling staff working at the 2 midwife obstetric units, who would potentially be involved in or affected by the implementation of an screening and brief intervention plan, were invited to participate in the research	Qualitative interviews	The study investigated the health care providers' perceptions of the acceptability and feasibility of providing SBIRT to address substance use among pregnant women attending antenatal care	Lack of a formal protocol to assist with alcohol and other drug use screening and related risks - Barriers that need to be considered when implementing SBIRT for substance are: patients' non-disclosure, staff attitudes, lack of training, and staff shortages

Study Author	Year	Number of participants	Sample characteristics relevant to the clinical question	Study Design	Intervention	Major findings pertinent to the clinical question
Montag et al.	2015	263	Women from 18 to 45 years of age, of childbearing potential	Randomized controlled trial	A culturally targeted Screening, Brief Intervention, and Referral to Treatment (SBIRT) to reduce risky drinking and vulnerability to AEP	Participation in assessment alone may have been sufficient to encourage behavioral change. SBIRT intervention did not result in a change of risky drinking behaviors.
Smith et al.	2014	409	Women aged 18 and over who attended for their initial antenatal appointment (10-11 weeks' gestation) for blood tests and ultrasound scan	Cross-sectional survey	Questionnaires containing a screening tool such as AUDIT, AUDIT-C or T-ACE	Of the 409 women respondents, a quarter of women reported drinking alcohol despite being aware they are pregnant
Cucciare et al.	2016	30	Women participants answered "yes" to questions about whether they had discussed, with their PCP, their alcohol consumption during a routine visit within the prior year, and had consumed alcohol in the past year	Qualitative interview	Interviews attempting to understand women's experiences disclosing alcohol use to their PCP and to obtain their preferences for alcohol-related care options.	The study found representing factors that influence women's decision to disclose alcohol use to a PCP such as: provider behaviors perceived as encouraging or discouraging disclosure of alcohol misuse, perceived positive relationship with provider, negative emotions of being judged or labeled an "alcoholic," health concerns about drinking, non-health related concerns, social support, clinic factors, and self-appraisal of drinking behavior.
Watt et al.	2014	24	18 years or older; currently pregnant or gave birth in the last year; and reported any alcohol consumption during the pregnancy period, including the period prior to pregnancy	Qualitative interviews.	Interviews, women were told about the risks of drinking during pregnancy, and were referred to appropriate substance use, mental health and prenatal services in the community.	Mental health played a vital role in the desire to drink alcohol. interventions that address distress and ways to develop coping skills, among women, could potentially decrease their desire to drink

Study Author	Year	Number of participants	Sample characteristics relevant to the clinical question	Study Design	Intervention	Major findings pertinent to the clinical question
O'Connor et al.	2011	619	Pregnant women between the ages of 18 and 41 years.	Cross-sectional design	Derived AUDIT-C; used for alcohol screening.	68% of women who reported drinking during pregnancy also reported high levels of depressive symptoms
Rendall-Mkosi et al.	2013	165	women aged 18–44 years at risk of alcohol exposed pregnancy.	Randomized controlled trial	The intervention consisted of Five-session motivational interviewing (MI)	There was a significant difference in the decline in the proportion of women at risk for an AEP in the MI group at 3 months (50 versus 24.59%; $P = 0.004$), maintained at 12 months (50.82 versus 28.12%; $P = 0.009$
Floyd et al.	2007	830	Non-pregnant women, aged 18–44 years, and currently at risk for an AEP	Randomized control trial	Participants were randomized to receive information plus a brief motivational intervention (MI) or to receive information only. The brief MI consisted of four counseling sessions and one contraception consultation	A brief motivational intervention can reduce the risk of an AEP.
Hettema et al.	2015	199	18 years or older female patients seen between July and October 2012.	Descriptive study	Self-administered survey to evaluate risk behaviors, receipt of SBIRT components, and patient attitudes towards receipt of services in these settings, in order to determine the suitability of these settings for SBIRT	Patient attitudes towards receipt of SBIRT services were favorable; more than 90% of women agreed that if their drinking was affecting their health, their women's health provider should advise them to cut down.
Balachova et al.	2015	689	Non-pregnant Russian women of childbearing age who were at AEP risk.	Descriptive study	A 40-minute face-to-face structured assessment interview that included demographic questions and assessment of alcohol use behavior using a SBQ	Women who were at risk of an AEP were identified by a single binge-drinking question.

Study Author	Year	Number of participants	Sample characteristics relevant to the clinical question	Study Design	Intervention	Major findings pertinent to the clinical question
Montag et al.	2017	37	women 18 to 45 years of age with and without children	Focus groups and interviews	The intervention consisted of a single face-to-face intervention session assessing each participant's risk and readiness to change, providing personalized feedback regarding risk, alcohol consumption and encouraging motivation to change	This study emphasized on a more collectivistic approach, through inclusion of relatives and friends in assessment and in the motivation to reduce risky drinking.
Sobel et al.	2017	354	Childbearing age (18-44) who were at risk of an AEP	Randomized Control Trial	Information only regarding consequences of AEPs (IO; *n* = 174) or motivational feedback (MF; *n* = 180)	This study strongly suggests that the most effective AEP prevention strategy is to simply communicate to those women at risk that they could become pregnant.
Delrahim-Howlett et al.	2011	150	nonpregnant women a minimum age of 18 years, capable of future pregnancy	A double blinded, 2-group randomized controlled	Those in the experimental group received personalized feedback in electronic format during the session. Women in the control group received generic information about risks associated with alcohol use in general and during pregnancy	Findings suggest that simply assessing a behavior may result in a change in that behavior. Detailed and interactive assessments of alcohol consumption may be sufficient for the reduction of risky drinking within this population without personalized feedback.

Figure 1

Critical Appraisal Tools

RAPID CRITICAL APPRAISAL OF QUALITATIVE EVIDENCE

1. Are the results of the study valid (trustworthy and credible)?

a. How were the participants chosen?
b. How were accuracy and completeness of data assured?
c. How plausible/believable are the results?
    i. Are implications of the research stated? Yes No Unknown
        1. May new insights increase sensitivity to others needs? Yes No Unknown
        2. May understandings enhance situational competence? Yes No Unknown
    ii. What is the effect on the reader?
        1. Are results plausible and believable? Yes No Unknown
        2. Is the reader imaginatively drawn into the experience? Yes No Unknown

2. What are the results?

a. Does the research approach fit the purpose of the study? Yes No Unknown
    i. Does the researcher identify the study approach? Yes No Unknown
        1. Are language and concepts consistent with the approach? Yes No Unknown
        2. Are data collection and analysis techniques appropriate? Yes No Unknown
    ii. Is the significance/importance of the study explicit? Yes No Unknown
        1. Does review of the literature support a need for the study? Yes No Unknown
        2. Do sample composition and size reflect study needs? Yes No Unknown
    iii. Is the sampling strategy clear and guided by study needs? Yes No Unknown
        1. Does the research control selection of the sample? Yes No Unknown
        2. Do sample composition and size reflect study needs? Yes No Unknown

b. Is the phenomenon (human experience) clearly identified? Yes
No Unknown
i. Are the data collection procedures clear? Yes No
Unknown
1. Are sources and means of verifying data explicit? Yes
No Unknown
2. Are researcher roles and activities explained? Yes No
Unknown
ii. Are data analysis procedures described? Yes No
Unknown
1. Does analysis guide direction of sampling and when Yes
No Unknown
it ends?
2. Are data management processes described? Yes
No Unknown

c. What are the reported results (description or interpretation)?
i. How are specific findings presented?
1. Is presentation logical, consistent, and easy to follow? Yes No
Unknown
2. Do quotes fit the findings they are intended to illustrate? Yes
No Unknown
ii. How are the overall results presented?
1. Are meanings derived from data described in context? Yes No
Unknown
2. Does the writing effectively promote understanding? Yes No
Unknown

3. Will the results help me in caring for my patients?

a. Are the results relevant to persons in similar situations? Yes No
Unknown
b. Are the results relevant to patient values and/or circumstances? Yes No
Unknown
c. How may the results be applied in clinical practice? Yes
No Unknown

RAPID CRITICAL APPRAISAL OF EVIDENCE BASED GUIDELINES

1. Credibility

a. Who were the guideline developers?
b. Were the developers representative of key stakeholders in this specialty (interdisciplinary)? Yes No Unknown
c. Who funded the guideline development?
d. Were any of the guideline's developers funded researchers of the reviewed studies? Yes No No Unknown
e. Did the team have a valid development strategy? Yes No Unknown
f. Was an explicit (how decisions were made), sensible and impartial process used to identify, select, and combine evidence? Yes No Unknown
g. Did its developers carry out a comprehensive, reproducible literature review within the past 12 months of its publication/revision? Yes No Unknown
h. Were all important options and outcomes considered? Yes No Unknown
i. Is each recommendation in the guideline tagged by the level/strength of evidence upon which it is based and linked with the scientific evidence? Yes No Unknown
j. Do the guidelines make explicit recommendations (reflecting value judgments about outcomes)? Yes No Unknown
k. Has the guideline been subjected to peer review and testing? Yes No Unknown

2. Applicability/Generalizability

a. Is the intent of use provided (national, regional, local)? Yes No Unknown
b. Are the recommendations clinically relevant? Yes No Unknown
c. Will the recommendations help me in caring for my patients? Yes No Unknown
d. Are the recommendations practical/feasible (e.g. resources-people and equipment) available? Yes No Unknown
e. Are the recommendations a major variation from current practice? Yes No Unknown
f. Can the outcomes be measured through standard care? Yes No Unknown

RAPID CRITICAL APPRAISAL QUESTIONS FOR COHORT STUDIES

1. Are the results of the study valid?

a. Was there a representative and well defined sample of patients at a similar point in the course of the disease? Yes No Unknown

b. Was follow-up sufficiently long and complete? Yes No Unknown

c. Were objective and unbiased outcome criteria used? Yes No Unknown

d. Did the analysis adjust for important prognostic risk factors and confounding variables? Yes No Unknown

2. What are the results?

a. What is the magnitude of the relationship between predictors (i.e. prognostic indicators) and target outcomes? Yes No Unknown

b. How likely is the outcome event(s) in a specified period of time? Yes No Unknown

c. How precise are the study estimates? Yes No Unknown

3. Will the results help me in caring for my patients?

a. Were the study patients similar to my own? Yes No Unknown

b. Will the results lead directly to selecting or avoiding therapy? Yes No Unknown

c. Are the results useful for reassuring or counseling patients? Yes No Unknown

Fineout-Overholt & Melnyk (2015)

RAPID CRITICAL APPRAISAL CHECKLIST FOR A RANDOMIZED CLINICAL TRIAL

1. Are the results of the study valid?

a. Were the subjects randomly assigned to the experimental and control groups? Yes No Unknown

b. Was random assignment concealed from the individuals who were first enrolling subjects into the study? Yes No Unknown

c. Were the subjects and providers blind to the study group? Yes No Unknown

d. Were reasons given to explain why subjects did not complete the study? Yes No Unknown

e. Were the follow-up assessments conducted long enough to fully study the effects of the intervention? Yes No Unknown

f. Were the subjects analyzed in the group to which they were randomly assigned? Yes No Unknown

g. Was the control group appropriate? Yes No Unknown

h. Were the instruments used to measure the outcomes valid and reliable? Yes No Unknown

i. Were the subjects in each of the groups similar on demographic and baseline clinical variables? Yes No Unknown

2. What are the results?

a. How large is the intervention or treatment effect (effect size, level of significance)?

b. How precise is the intervention or treatment?

3. Will the results help me in caring for my patients?

a. Were all clinically important outcomes measured? Yes No Unknown

b. What are the risks and benefits of the treatment?

c. Is the treatment feasible in my clinical setting? Yes No Unknown

d. What are my patient's values/family's values and expectations for the outcome that trying to be prevented and the treatment itself?

Fineout-Overholt & Melnyk (2015)

RAPID CRITICAL APPRAISAL OF SYSTEMATIC REVIEWS OF CLINICAL INTERVENTIONS/TREATMENTS

1. **Are the results of the review valid?**
    a. Are the studies contained in the review randomized controlled trials? Yes No Unknown
    b. Does the review include a detailed description of the search strategy to find all relevant studies? Yes No Unknown
    c. Does the review describe how validity of the individual studies was assessed (e.g. methodological quality, including the use of random assignment to study groups and complete follow-up of the subjects)? Yes No Unknown
    d. Were the results consistent across studies? Yes No Unknown
    e. Were individual patient data or aggregate data used in the analysis? Yes No Unknown
2. **What were the results?**
    a. How large is the intervention or treatment effect (odds ratio, effect size, level of significance)?
    b. How precise is the intervention or treatment?
3. **Will the results assist me in caring for my patients?**
    a. Are my patients similar to the ones included in the review? Yes No Unknown
    b. Is it feasible to implement the findings in my practice setting? Yes No Unknown
    c. Were all clinically important outcomes considered, including risks and benefits of treatment? Yes No Unknown
    d. What is my clinical assessment of the patient and are there any contraindications or circumstances that would inhibit me from implementing the treatment? Yes No Unknown
    e. What are my patient's and his/her family's preferences and values about the treatment that is under consideration?

Figure 2

Evidence Levels for Research Evaluation

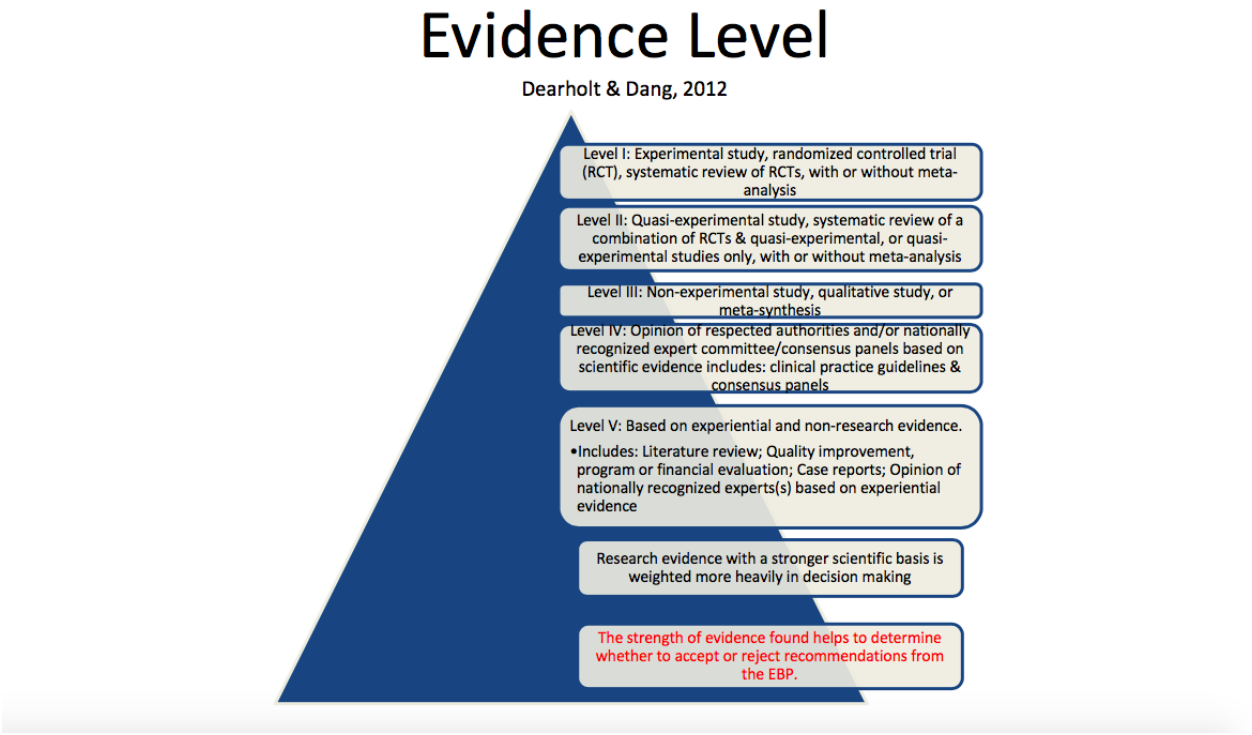
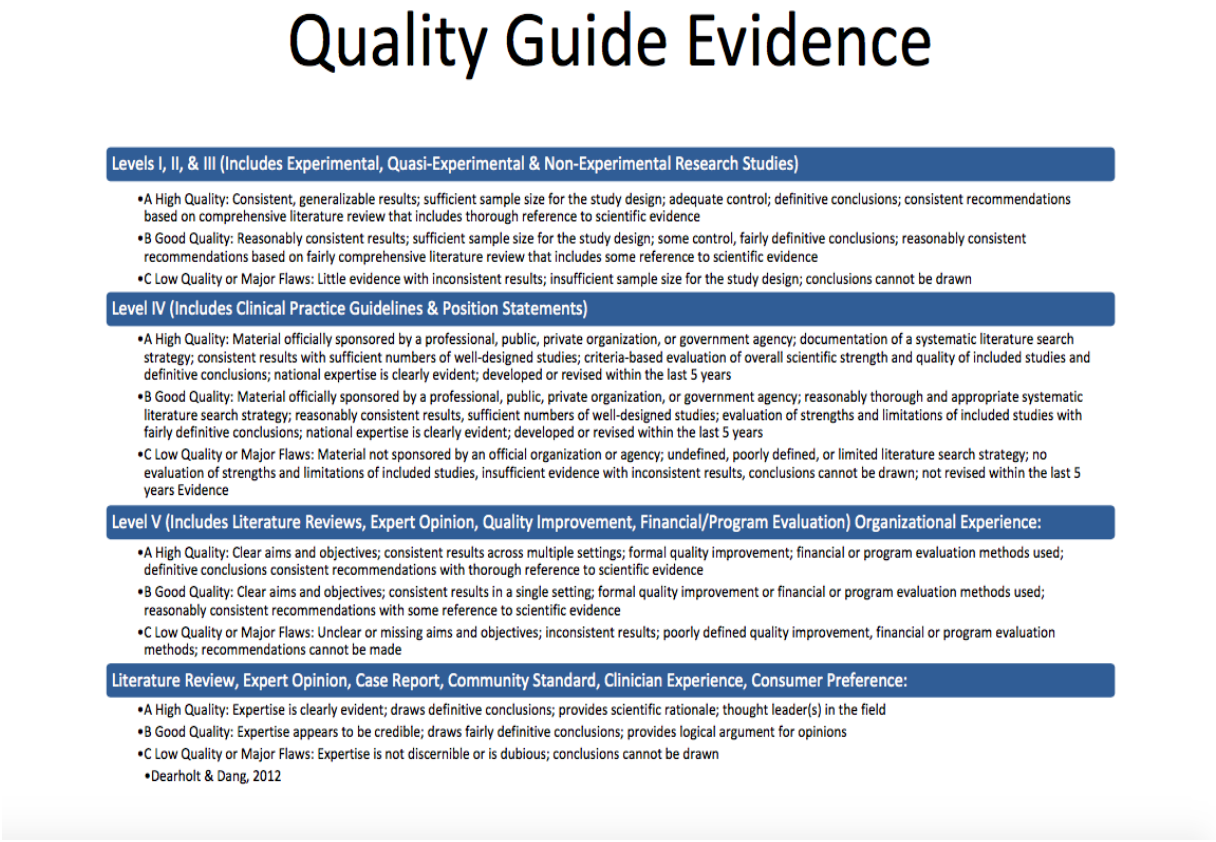


Figure 3

Grading Tools for Evidence Quality



Quality Guide Evidence

Levels I, II, & III (Includes Experimental, Quasi-Experimental & Non-Experimental Research Studies)

- A High Quality: Consistent, generalizable results; sufficient sample size for the study design; adequate control; definitive conclusions; consistent recommendations based on comprehensive literature review that includes thorough reference to scientific evidence
- B Good Quality: Reasonably consistent results; sufficient sample size for the study design; some control, fairly definitive conclusions; reasonably consistent recommendations based on fairly comprehensive literature review that includes some reference to scientific evidence
- C Low Quality or Major Flaws: Little evidence with inconsistent results; insufficient sample size for the study design; conclusions cannot be drawn

Level IV (Includes Clinical Practice Guidelines & Position Statements)

- A High Quality: Material officially sponsored by a professional, public, private organization, or government agency; documentation of a systematic literature search strategy; consistent results with sufficient numbers of well-designed studies; criteria-based evaluation of overall scientific strength and quality of included studies and definitive conclusions; national expertise is clearly evident; developed or revised within the last 5 years
- B Good Quality: Material officially sponsored by a professional, public, private organization, or government agency; reasonably thorough and appropriate systematic literature search strategy; reasonably consistent results, sufficient numbers of well-designed studies; evaluation of strengths and limitations of included studies with fairly definitive conclusions; national expertise is clearly evident; developed or revised within the last 5 years
- C Low Quality or Major Flaws: Material not sponsored by an official organization or agency; undefined, poorly defined, or limited literature search strategy; no evaluation of strengths and limitations of included studies, insufficient evidence with inconsistent results, conclusions cannot be drawn; not revised within the last 5 years Evidence

Level V (Includes Literature Reviews, Expert Opinion, Quality Improvement, Financial/Program Evaluation) Organizational Experience:

- A High Quality: Clear aims and objectives; consistent results across multiple settings; formal quality improvement; financial or program evaluation methods used; definitive conclusions consistent recommendations with thorough reference to scientific evidence
- B Good Quality: Clear aims and objectives; consistent results in a single setting; formal quality improvement or financial or program evaluation methods used; reasonably consistent recommendations with some reference to scientific evidence
- C Low Quality or Major Flaws: Unclear or missing aims and objectives; inconsistent results; poorly defined quality improvement, financial or program evaluation methods; recommendations cannot be made

Literature Review, Expert Opinion, Case Report, Community Standard, Clinician Experience, Consumer Preference:

- A High Quality: Expertise is clearly evident; draws definitive conclusions; provides scientific rationale; thought leader(s) in the field
- B Good Quality: Expertise appears to be credible; draws fairly definitive conclusions; provides logical argument for opinions
- C Low Quality or Major Flaws: Expertise is not discernible or is dubious; conclusions cannot be drawn
- Dearholt & Dang, 2012

Figure 4

CDC FAS Guidelines

1. **Abnormal facial features**

   A person with FAS has three distinct facial features:

   - Smooth ridge between the nose and upper lip (smooth philtrum)
   - Thin upper lip
   - Short distance between the inner and outer corners of the eyes, giving the eyes a wide-spaced appearance.

2. **Growth problems**

   Children with FAS have height, weight, or both that are lower than normal (at or below the 10th percentile). These growth issues might occur even before birth. For some children with FAS, growth problems resolve themselves early in life.

3. **Central nervous system problems**

   The central nervous system is made up of the brain and spinal cord. It controls all the workings of the body. When something goes wrong with a part of the nervous system, a person can have trouble moving, speaking, or learning. He or she can also have problems with memory, senses, or social skills. There are three categories of central nervous system problems:

   I. Structural

      FAS can cause differences in the structure of the brain. Signs of structural differences are:

      - Smaller-than-normal head size for the person's overall height and weight (at or below the 10th percentile).
      - Significant changes in the structure of the brain as seen on brain scans such as MRIs or CT scans.

   II. Neurologic

      There are problems with the nervous system that cannot be linked to another cause. Examples include poor coordination, poor muscle control, and problems with sucking as a baby.

   III. Functional

      The person's ability to function is well below what's expected for his or her age, schooling, or circumstances. To be diagnosed with FAS, a person must have:

      - Cognitive deficits (e.g., low IQ), or significant developmental delay in children who are too young for an IQ assessment.Or
      - Problems in at least three of the following areas:

        a. Cognitive deficits (e.g., low IQ) or developmental delays

           Examples include specific learning disabilities (especially math), poor grades in school,

performance differences between verbal and nonverbal skills, and slowed movements or reactions.

b. Executive functioning deficits

These deficits involve the thinking processes that help a person manage life tasks. Such deficits include poor organization and planning, lack of inhibition, difficulty grasping cause and effect, difficulty following multistep directions, difficulty doing things in a new way or thinking of things in a new way, poor judgment, and inability to apply knowledge to new situations.

c. Motor functioning delays

These delays affect how a person controls his or her muscles. Examples include delay in walking (gross motor skills), difficulty writing or drawing (fine motor skills), clumsiness, balance problems, tremors, difficulty coordinating hands and fingers (dexterity), and poor sucking in babies.

d. Attention problems or hyperactivity

A child with these problems might be described as "busy," overly active, inattentive, easily distracted, or having difficulty calming down, completing tasks, or moving from one activity to the next. Parents might report that their child's attention changes from day to day (e.g., "on" and "off" days).

e. Problems with social skills

A child with social skills problems might lack a fear of strangers, be easily taken advantage of, prefer younger friends, be immature, show inappropriate sexual behaviors, and have trouble understanding how others feel.

f. Other problems

Other problems can include sensitivity to taste or touch, difficulty reading facial expression, and difficulty responding appropriately to common parenting practices (e.g., not understanding cause-and-effect discipline)

Figure 5

FASD Coordinating Agencies

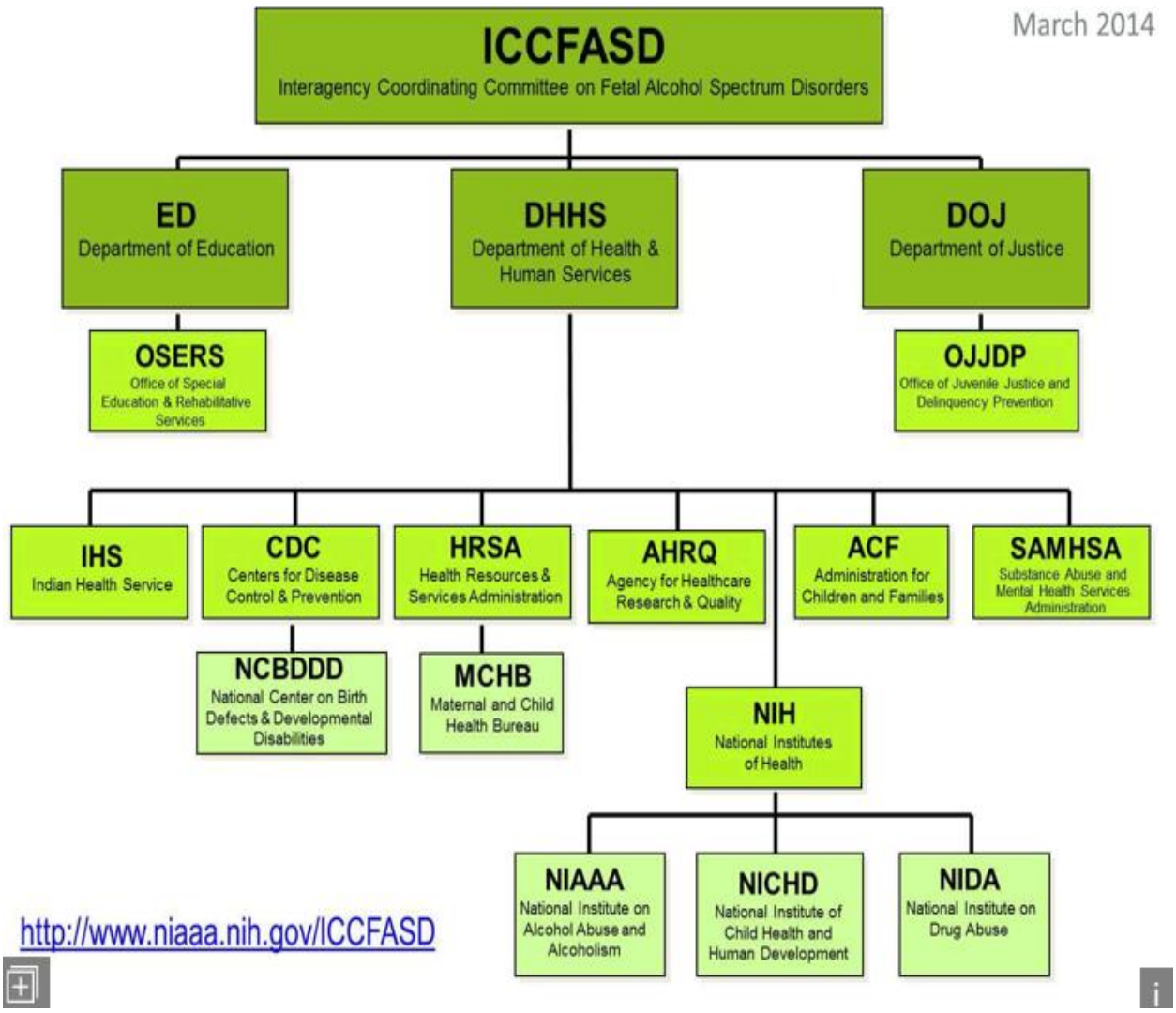


Figure 6

Standard Drink Measurements

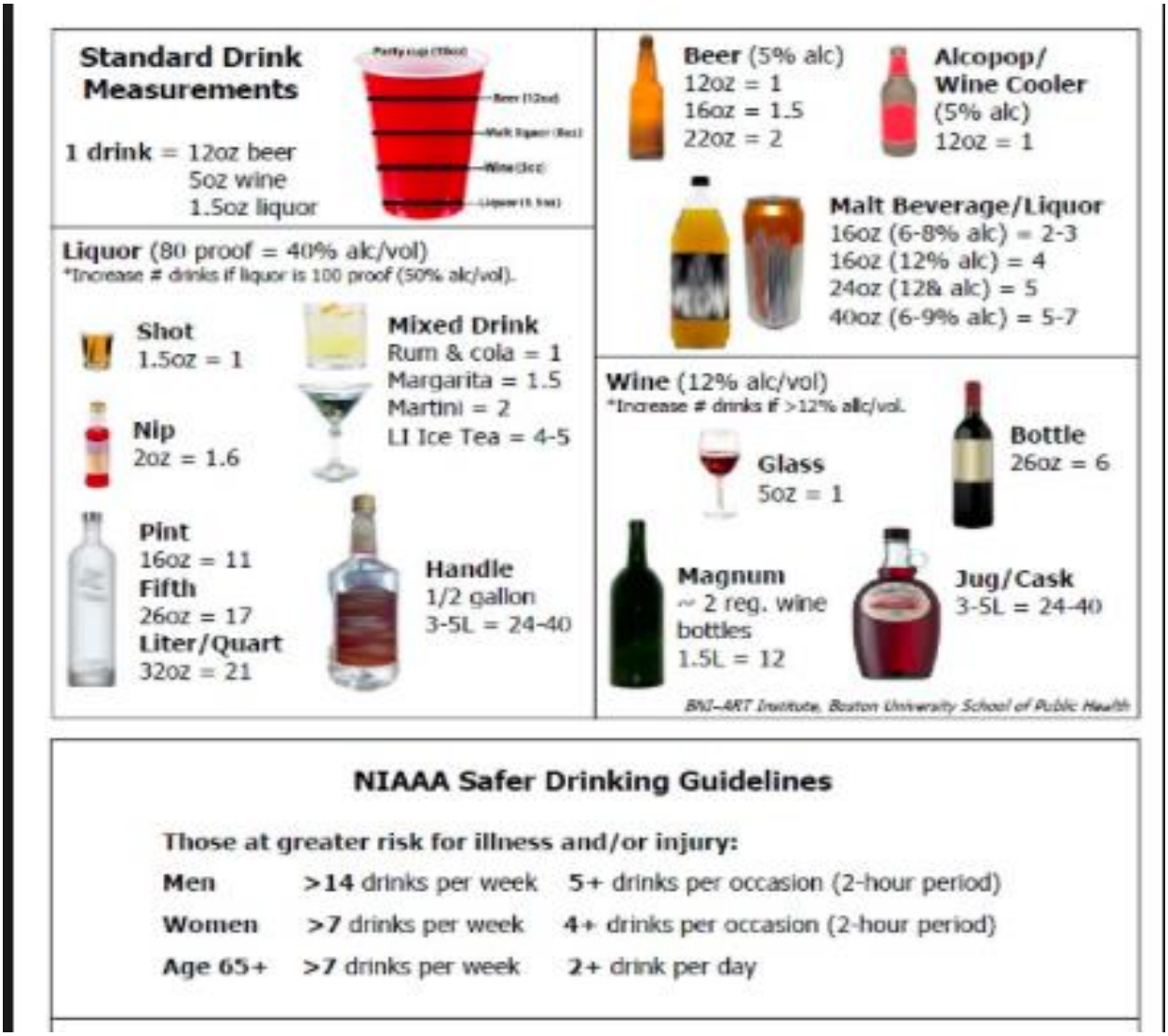


Figure 7

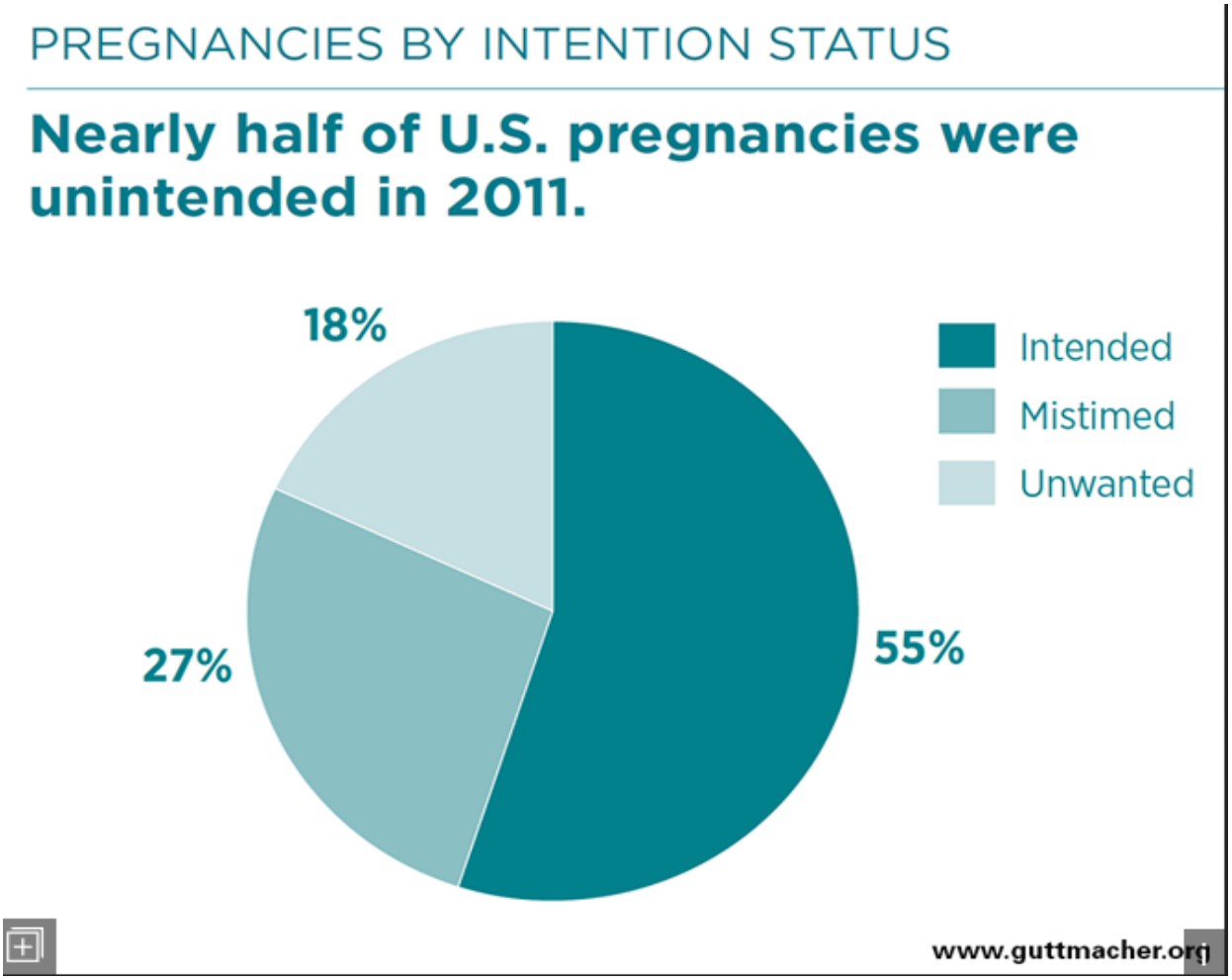
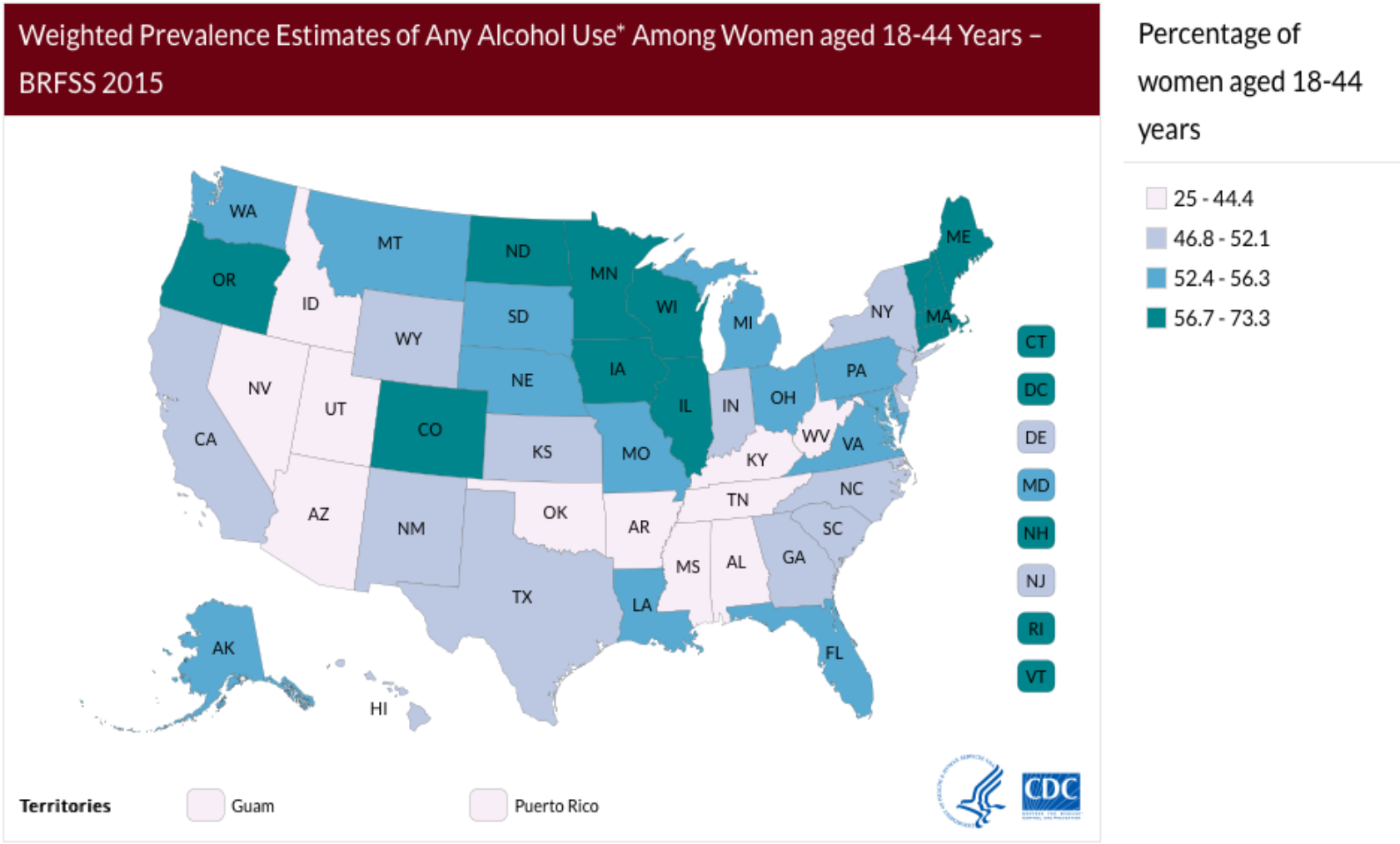

PREGNANCIES BY INTENTION STATUS
Nearly half of U.S. pregnancies were unintended in 2011.
18%
27%
55%
Intended
Mistimed
Unwanted
www.guttmacher.org

Figure 8


Weighted Prevalence Estimates of Any Alcohol Use* Among Women aged 18-44 Years – BRFSS 2015
Percentage of women aged 18-44 years
25 - 44.4
46.8 - 52.1
52.4 - 56.3
56.7 - 73.3
WA
OR
CA
ID
NV
MT
WY
UT
AZ
CO
NM
ND
SD
NE
KS
OK
TX
MN
IA
MO
AR
LA
WI
IL
MS
MI
IN
KY
TN
AL
OH
WV
GA
FL
SC
NC
VA
PA
NY
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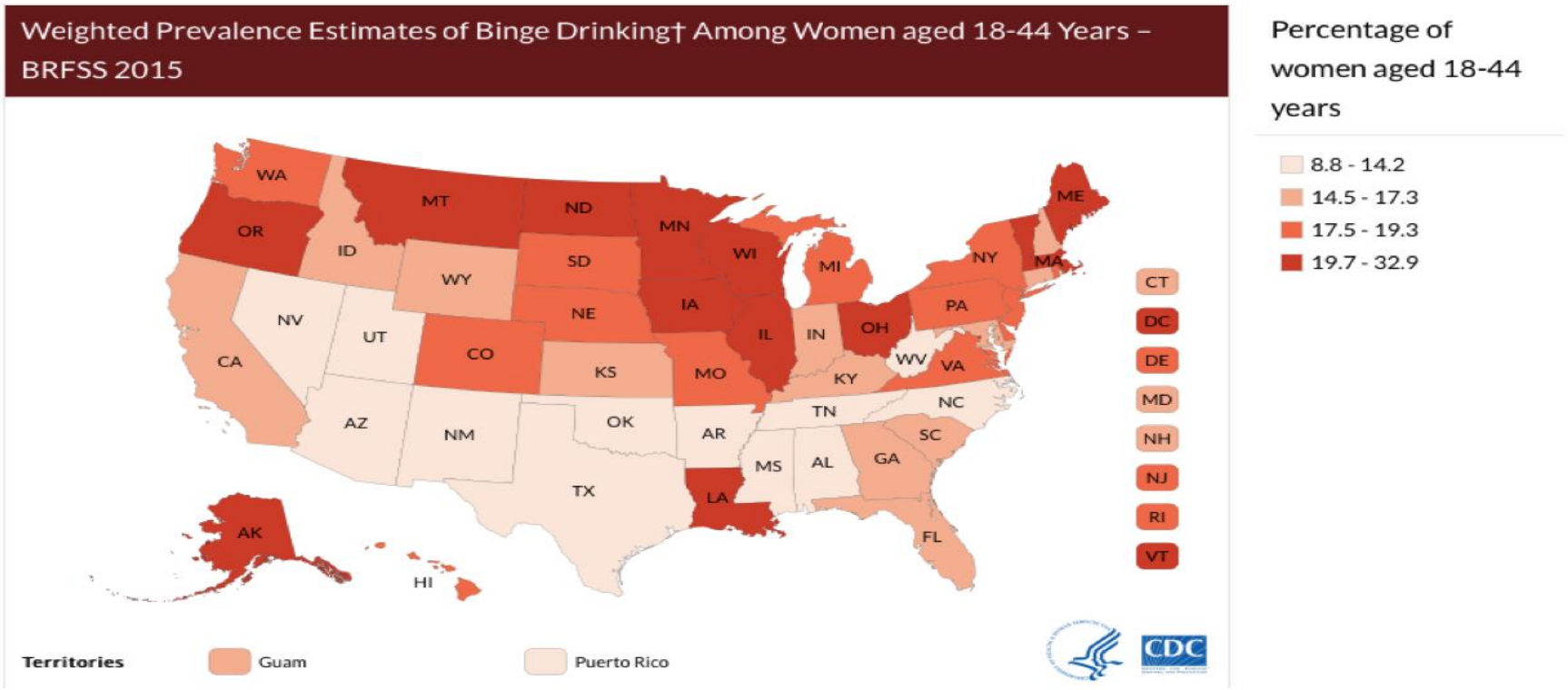
MD
NH
NJ
RI
VT
AK
HI
Territories
Guam
Puerto Rico
CDC

Figure 9


Weighted Prevalence Estimates of Binge Drinking† Among Women aged 18-44 Years – BRFSS 2015
Percentage of women aged 18-44 years
8.8 - 14.2
14.5 - 17.3
17.5 - 19.3
19.7 - 32.9
WA
OR
CA
ID
NV
MT
WY
UT
AZ
CO
NM
ND
SD
NE
KS
OK
TX
MN
IA
MO
AR
LA
WI
IL
MS
MI
IN
KY
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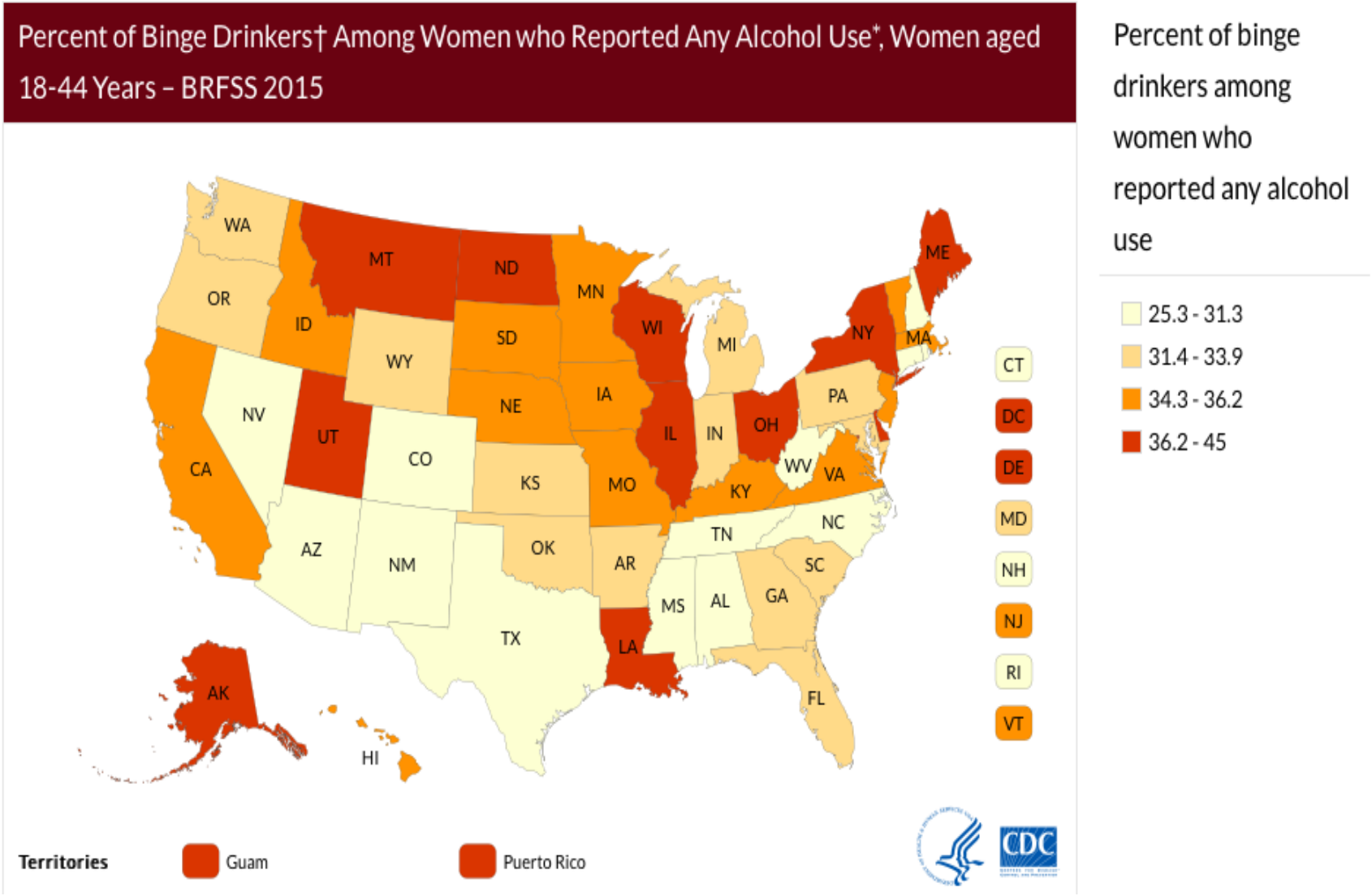
Territories
Guam
Puerto Rico
CDC

Figure 10


Percent of Binge Drinkers† Among Women who Reported Any Alcohol Use*, Women aged 18-44 Years – BRFSS 2015
WA
OR
CA
ID
NV
MT
WY
UT
AZ
CO
NM
ND
SD
NE
KS
OK
TX
MN
IA
MO
AR
LA
WI
IL
MI
IN
OH
KY
TN
MS
AL
GA
FL
SC
NC
VA
WV
PA
NY
ME
MA
CT
DC
DE
MD
NH
NJ
RI
VT
AK
HI
Territories
Guam
Puerto Rico
CDC
Percent of binge drinkers among women who reported any alcohol use
25.3 - 31.3
31.4 - 33.9
34.3 - 36.2
36.2 - 45