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Evaluation of a Screening, Brief Intervention, and Referral to Treatment (SBIRT) Program on Alcohol Use Outcomes in a Georgia Emergency Department

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B.S., University of Georgia, 2008

Thesis Committee Chair: J. Aaron Johnson, Ph.D

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Abstract

Evaluation of a Screening, Brief Intervention, and Referral to Treatment (SBIRT) Program on Alcohol Use Outcomes in a Georgia Emergency Department

By: Joanna Akin

Screening, Brief Intervention, and Referral to Treatment (SBIRT) programs aim to screen for and identify individuals at risk for substance use disorders (SUDs), deliver brief interventions to them, and, when appropriate, refer them to more intensive services. SBIRT programs have been well documented as effective in primary care settings. They have been shown to decrease alcohol consumption, reduce injuries, and lower health care costs. The programs are less established in emergency department (ED) settings. Results of randomized controlled trials in EDs have been mixed, and few effectiveness studies of EDs have used an adequate control group for comparison.

The *GA BASICS* program is a controlled SBIRT program that is being implemented at an urban emergency department in Georgia. The study period for this report was from February 2009 to April 2010 and included a sequentially enrolled control group. A 10% sample of intervention participants received SBIRT services through the Medical Center of Central Georgia (MCCG) emergency department, was consented for follow up, and was enrolled in the study. This evaluation will examine the effect of SBIRT services on alcohol use outcomes.

When controlling for baseline drinking days, intervention participants drank 1.96 fewer days than controls at 6 months (95% CI, -3.95 to 0.034) , and binge drank on 2.25 fewer days (95% CI, -4.08 to -0.419) than controls at 6 months. While these findings are limited due to the self-report data, there is evidence that the SBIRT intervention at MCCG contributed to a reduction in alcohol use. Future studies should examine auxiliary outcomes, should conduct cost-benefit analyses, and should investigate intervention factors contributing to positive substance use outcomes.

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Introduction:

Alcohol abuse and misuse contribute significantly to the disease burden in the United States. Lost work productivity, unintentional injuries, increased crime, and a multitude of physical and mental consequences all contribute to the immense economic and social costs associated with problematic drinking. For this reason, programs that aim to reduce alcohol's economic and disease burden demand our attention.

SBIRT (Screening, Brief Intervention, and Referral to Treatment) is a public health approach to address alcohol abuse and misuse. SBIRT programs identify individuals at risk due to their use, offer brief interventions to them, and, if appropriate, link individuals to additional treatment. These programs are integrated into a community's system of services for both drug and alcohol abuse, and they can be operated in a variety of health care settings.

The SBIRT approach has been shown to be effective. Numerous randomized controlled trials of primary care screening and brief intervention programs have demonstrated a decrease in the frequency and amount of alcohol consumed among program participants (Wilk et al., 1997; Wallace et al., 1998; Fleming et al., 1999, 2002; Whitlock et al., 2004; Bertholet et al., 2005). They have also reported reduced trauma recidivism (Havard et al., 2008) and lowered health care costs related to alcohol abuse and misuse (Fleming et al., 2002).

SBIRT programs in Emergency Departments have been fairly well documented (Monti et al., 1999; Gentilello et al., 1999; Longaboaugh et al., 2001; Spirito et al., 2004). However, few effectiveness studies in emergency departments have utilized a control group in their evaluation, (Madras et al., 2009) and several well designed studies have

reported null findings (Deappen et al., 2007; D'Onofrio et al., 2008; Aseltine et al., 2010). Because of this, it is unclear which components of SBIRT are producing success.

For instance, it has been proposed that screening alone may serve as a cost effective option for reducing alcohol use (Daeppen et al., 2007). Others have suggested that the ED visit in itself could be serving as a powerful behavioral intervention. Furthermore, observed positive outcomes from self-report data may be due to regression to the mean. Regardless, it remains to be seen whether or not a brief intervention is superior to screening and discharge instructions alone for ED settings. Thus, studies that use an adequate control group for comparison are vital for evaluating the effectiveness of SBIRT in emergency departments and in determining the future course and continuation of SBIRT programs.

This report will assess the effectiveness of a controlled SBIRT program (the *GA BASICS* program) which is being implemented at an urban hospital in Georgia (The Medical Center of Central Georgia). The report will answer the question; Is the *GA BASICS* intervention effective at reducing the amount of alcohol consumed by a sample of program participants? It is hypothesized that, compared to controls, participants receiving a brief intervention will report fewer binge days at 6 month follow up, will report fewer drinking days at 6 month follow up, and will be more likely to report abstinence from alcohol at 6 month follow up.

Literature Review:

Alcohol as a Public Health Problem

Alcohol use profoundly affects the health of the US population. The CDC estimates that excessive alcohol use kills 79,000 people each year and is responsible for 2.3 million years of potential life lost in the United States. It is the third leading cause of lifestyle-related death in the United States. Excessive alcohol consumption includes "heavy drinking" (more than 2 drinks per day on average for men and more than 1 drink per day on average for women) and "*binge drinking"* (5 or more drinks per occasion for men and 4 or more drinks per occasion for women) (CDC a, 2010). It is associated with a host of physical and mental health problems which contribute significantly to health care costs. These problems include intentional and unintentional injuries, liver disease, cardiovascular disease, unintended pregnancies, fetal alcohol syndrome, poor diabetes control, psychological problems, and interpersonal problems (CDC b, 2010).

The economic and social costs due to alcohol use are immense. It has been estimated that alcohol use problems cost the US $185 billion total in 1998 with $19 billion of those dollars spent on direct medical consequences (Harwood, 2000). Alcohol is a factor in almost 1/3 of all traffic related deaths in the United States, and the annual cost of alcohol related motor vehicle accidents in the US exceeds $51 billion (CDC c, 2010). Alcohol plays a major part in domestic violence incidents. The National Institutes on Alcohol Abuse and Alcoholism reports that "30 to 40 percent of men and 27 to 34 percent of women who perpetrated violence against their partners were drinking at the time of the event" (Caetano et al., 2001). It is clear that alcohol plays a role in many public health ills and it requires much of our time, resources, and services to contain.

In Georgia, alcohol misuse is prevalent. According to a 2005-2006 national survey, 35% of Georgia residents between the ages of 18 and 25 and 19% of Georgia residents aged 26 and older reported binge drinking in the past year. Even more troubling is the finding that fewer than half of Georgia residents aged 18 and older saw a great risk associated with binge drinking. This perception poses a challenge to health care providers in the state (SAMHSA b).

The National Institute on Alcohol Abuse and Alcoholism (NIAAA) defines hazardous or "at risk" drinking as more than 14 drinks per week and more than 4 drinks per occasion for men, or more than 7 drinks per week and more than 3 drinks per occasion for women and all people older than 65 years. "Low risk" users drink at levels below or equal to the NIAAA guidelines above **(**NIAAA, 2005). In the United States, 4% of the population are considered dependent users, 25% are considered "at risk" users, and 71% are considered "low risk" users or abstainers (SAMHSA, 2008). Importantly, it is believed that risky (non-dependant) alcohol use is a greater public health burden than dependant use (Bethea and Daugherty, 2010). Therefore, it is imperative that efforts to lessen the social and economic burden of alcohol use disorders focus on "at risk" users in addition to dependent users.

SBIRT: Screening, Brief Intervention, and Referral to Treatment

Traditionally, substance abuse/misuse interventions have targeted either the 4% of users who are termed "dependent" or they have targeted abstainers by trying to prevent alcohol use initiation. This approach ignores a large portion of the drinking population in the Unites States; the "at risk" drinkers. In more recent decades, health care practitioners have adopted a new attitude when it comes to the treatment and prevention of alcohol

misuse and abuse. SBIRT programs (Screening, Brief Intervention, and Referral to Treatment) have begun to target the “at risk” portion of the population and work towards harm reduction by trying to prevent future injury and disease associated with alcohol or other substance use. The programs aim to identify people at risk and help them move into a low risk or no risk use category while simultaneously identifying and introducing treatment to those patients who are at very high risk or are considered addicted to alcohol. In essence, SBIRT treats the whole spectrum of alcohol use disorders (Clay, 2009).

SBIRT is based on a set of core components that allow it to work for many different people in many different settings: The components are:

Screening: A screening instrument like the AUDIT (Alcohol Use Disorders Identification Test) or the ASSIST (Alcohol, Smoking and Substance Involvement Screening Test) is used to identify individuals who are at risk for experiencing consequences related to their alcohol or drug use.

Brief Intervention: A brief intervention is administered when an individual has been identified at moderate risk or higher risk for substance use. The brief intervention involves raising awareness of the consequences of substance use and motivating behavior change through a directed discussion of a patient’s reasons for using and their reasons for change.

Brief Treatment: Brief treatment is offered to individuals at moderate to high risk for experiencing consequences related to their substance use. It involves several therapy sessions with a trained clinician.

Referral to Treatment: The referral component links patients with severe substance use disorders (SUD's) to move intensive services (SAMHSA a).

Some SBIRT programs base the brief intervention on motivational interviewing (MI). MI is a patient-centered, directive, non judgmental and non-confrontational approach to facilitating behavior change. As the name indicates, a counselor using motivational interviewing will enhance an individual's own motivation to change while totally avoiding the expert role of lecturing, advice giving (without permission), or judgment. It hinges on the counselor's ability to explore the patient's ambivalence to change and on resolving that ambivalence through open-ended questions, affirmations, reflections, and summaries (Miller and Rollnick, 2002). Motivational interviewing has been taught to a wide range of health care providers. In settings using SBIRT services, doctors, nurses, and other health care providers are taught how to deliver a brief intervention, while other sites train health workers and counselors external to the health care facility.

A meta-analysis of MI interventions for alcohol reduction reveals that MI is more efficacious when compared to no treatment and to a variety of other treatments including skill based counseling and cognitive behavioral therapy (Vasilaki et al, 2006). In a systematic literature review, Dunn et al. (2001) reports "There was substantial evidence that MI is an effective substance abuse intervention method when used by clinicians who are non-specialists in substance abuse treatment, particularly when enhancing entry to and engagement in more intensive substance abuse treatment and treatment-as-usual."

The Case for SBIRT in Primary Care

SBIRT programs are based on over 20 years of research supporting the efficacy of screening and brief intervention (SBI) for alcohol use reduction, risk reduction, and cost reduction. Randomized controlled trials in both Europe and the United States have supported the efficacy of SBI in primary care settings (Wilk et al., 1997; Wallace et al., 1998; Fleming et al., 1997, 2002; Whitlock et al., 2004; Bertholet et al., 2005).

A landmark study conducted by Fleming et al. (1997) in Wisconsin followed a sample of 723 men and women randomized to either control or intervention groups for one year. It was the "first large US clinical trial conducted in community-based primary care practices to test the efficacy of brief physician advice in reducing alcohol use by problem drinkers." Researchers found that both treatment and control group participants reduced their number of drinks in the past 7 days and reduced their number of binge drinks in the past 30 days. Additionally, the percentage of people who drank excessively in the past 7 days was lowered for both treatment and control groups. The reductions in the treatment group were significantly greater than the reductions in the control group for all three measures ($p<0.001$). The results from this trial were consistent with those seen by Wallace et al. in 1988.

To date, several meta-analyses of controlled trials have concluded that SBI is efficacious in reducing alcohol consumption among "at risk drinkers." Wilk et al. (1997) observed an odds ratio of about 2 in favor of brief intervention over no intervention. In 2004, Whitlock et al. summarized the evidence across 19 studies of SBI in primary care. While the findings for the effects on binge drinking were inconsistent, results indicated a 13% to 34% net reduction in weekly drinking in the experimental groups compared to

control groups for good quality, brief, multi-contact intervention trials. In 2005, Bertholet et al. conducted a meta-analysis including 5639 non treatment seeking individuals and found a mean alcohol reduction of 4 drinks per week.

SBI for alcohol has been successful in primary care settings and has been translated to college campuses and to many different types of health care clinics including emergency departments (EDs), trauma centers, and mental health facilities. Cost-benefit analyses for SBI in primary care have reported favorable findings (Flemming et al., 2002). The effectiveness and cost-benefit of SBIRT in emergency departments is less established than in primary care.

SBI/SBIRT in Emergency Departments

It is widely known that alcohol contributes to a large portion of emergency department visits. In fact, it was reported that 7% of ED visits in 2001 could be attributed to alcohol (McDonald et al., 2004). It has been shown that patients entering the ED are up to 3 times more likely to report alcohol use disorders than patients entering primary care (Chirpitel, 1999). Even more important is that many people who visit the ED do not regularly see a primary care physician (Havard et al, 2008). It is believed that these visits are excellent “teachable moments” for drug and alcohol abusers. For this reason, EDs are desirable settings for substance use intervention programs like SBIRT.

Much of the evidence in support of SBIRT in emergency departments has come from randomized controlled trials (RCTs) targeting injured patients entering the ED. Many of these studies have produced promising outcomes in terms of risk reduction and alcohol use reduction. Some have reported positive results with teenagers (Spirito, 2004) and young adults, (Monti et al., 1999) while others have shown efficacy in adult

populations (>= 18 yrs.) (Gentilello et al., 1999; Longaboaugh et al., 2001) The brief interventions in the cited trials ranged from 30 to 60 minutes and were delivered by research assistants, counselors, and psychologists.

Monti et al. (1999) compared a brief motivational interviewing session to standard care in emergency department patients. At 6 months follow up, they reported a 50% reduction in alcohol related injuries in the intervention group versus a 21% reduction in the control group. Similarly, Gentilello et al. (1999) found a decrease in hospital readmissions and a decrease of 22 drinks per week in intervention patients compared to a decrease of 7 drinks per week in controls at 12 months follow up. Longaboaugh et al. (2001) found similar reductions in heavy alcohol use among treatment and control groups, but found that adding a booster session delivered one week after the brief intervention in the ED, significantly decreased alcohol related negative consequences and alcohol related injuries when compared to controls.

Still, some controlled studies of interventions in emergency departments have reported null and weakened results. (Havard et al., 2008; Deappen et al., 2007; D'Onofrio et al., 2008; Aseltine et al., 2010) A meta-analysis of ED interventions for alcohol use which included 13 randomized controlled trials (RTC), of which 8 reported administering a brief intervention based on motivational interviewing showed reduced trauma recidivism. However, results for reducing alcohol use at 3 and 6 months were inconclusive. In light of this puzzling result, the authors feel that outcome evaluation studies of alcohol related ED interventions are underrepresented in the literature (Havard et al., 2008).

A trial in Switzerland that compared a sample of patients receiving a brief intervention to a screening and feedback sample group, and a screening only group, found that there were no significant differences from baseline to follow up in risk reduction (as determined by the AUDIT), in drinking quantity, or in binge drinking episodes between all three groups. The authors speculate that ED's may not be ideal settings for brief interventions, but instead could direct patients to primary care where a brief intervention could be administered in a decidedly less hectic environment. (Deappen et al., 2007)

Another trial performed at an urban hospital in New Haven, CT with nearly 500 subjects did not limit the subjects to injured ED patients, but rather considered any patients entering the ED irrespective of presenting complaint. Researchers saw a greater difference in mean number of drinks per week and in binge drinking episodes, and a greater increase in readiness to change for the intervention group compared to the control group. However, none these between groups differences were significant (D'Onofrio et al., 2008). The authors call for more studies that test the efficacy of brief interventions in ED settings.

Of great importance to this paper is a report from the Academic SBIRT Research Collaborative detailing outcomes of an SBIRT intervention at 3, 6, and 12 months follow up. The 14 study sites included in the analysis used a quasi-experimental, sequentially enrolled control group for comparison to the intervention group. This study found that patients reduced their drinking relative to controls at 3 month follow up. They drank 3 drinks less per week than controls and their level of maximum drinks per occasion was ¾ of a drink less than controls. These findings were significant at the 5% significance level.

However, at 6 and 12 months, these effects had weakened and were no longer statistically significant (Aseltine et al., 2010).

Overall, the results of alcohol interventions involving ED patients are limited and mixed. It seems that the site, the type of brief intervention, and the characteristics of the study participants can all determine how beneficial the program is. It is clear that more studies using a controlled design are needed to evaluate SBIRT's effectiveness.

SAMHSA's Initiation of SBIRT

In order to address problematic substance use in public health systems, the federal government has started integrating substance abuse screening and brief interventions into regular medical practice. In 2003, SAMHSA, the Substance Abuse and Mental Health Services Administration, initiated the largest SBIRT service program of its kind across multiple sites and several health care settings. The program has been able to reach a vast and diverse population of at risk drug and alcohol users (SAMHSA a).

A recent meta-analysis of 6 SAMHSA funded SBIRT programs was performed in order to evaluate SBIRT's effectiveness in reducing problematic alcohol and illicit drug usage. A population of more than 450,000 individuals obtained from 4 of the 6 sites was used for secondary data analysis. In addition to major reductions in illicit drug usage, researchers found that participants reduced heavy alcohol use by 38.6 % ($p<0.001$) at 6 month follow up (Madras et al., 2009).

Unfortunately, as Madras et al. (2009) points out, the analysis was conducted in the absence of a control group for comparison. As seen in the RTC's above, control groups are vitally important in evaluating effectiveness since there appear to be many

program factors that influence behavior change in these trials. In fact, nearly every controlled study reviewed above observed a decrease in alcohol use in control groups as well as in intervention groups. It seems some component/s of these projects separate from the actual brief intervention (i.e. the screening tool, the clinic visit, regression to the mean phenomenon) is/are producing a decrease in self reported drug and alcohol use. Knowing to what degree a brief intervention adds to the effect of these programs is necessary in conducting an adequate cost-benefit analysis. For this reason, a quasi-experimental control group was enrolled in a recent SAMHSA funded SBIRT trial in Georgia. The program, *GA BASICS*, is part of the third cohort of SAMHSA's SBIRT initiative and, as the first of these programs to enroll this type of control group, its evaluation will provide an important piece to the puzzle.

Summary

There is an abundance of evidence supporting the efficacy of screening and brief intervention programs in primary care settings. The evidence supporting SBIRT for both injured and non-injured patients in EDs is growing. Yet, some research professionals question how well SBIRT may be translated into emergency and trauma settings. There is a great need for more effectiveness trials which use comparison groups to determine how much the brief intervention adds to positive alcohol use outcomes. SAMHSA has initiated SBIRT programs in order to test the feasibility and effectiveness of these programs across a wide variety of sites, settings, and demographic populations, but none of these sites have used adequate control groups for comparison. An effectiveness evaluation of the *GA BASICS* program which enrolled a quasi-experimental control group is in order.

Methods:

The *GA BASICS* program (Brief Assessment, Screening, Intervention, and Continuum of Care System) is part of the third cohort of SAMHSA funded SBIRT programs. The program is being implemented at Georgia's two largest hospitals; Grady Hospital in Atlanta and the Medical Center of Central Georgia in Macon. The program is being implemented primarily in these hospitals' Emergency Departments (both level 1 trauma centers) and secondarily in hospital-affiliated outpatient clinics. *GA BASICS is* an attempt to "expand and enhance the state's substance abuse service delivery system" (Valsquez and Seale, 2011). The program's primary objective is to increase the number of individuals who are identified as having substance use disorders or who are at risk for substance use disorders and to facilitate prevention and treatment of these individuals.

GA BASICS is currently in year three of five years of funding with SBIRT service delivery and study enrollment is ongoing at both locations. While program procedures are similar at both sites, data are currently available for only Medical Center of Central Georgia (MCCG) patients. For that reason, this report will serve as a midpoint evaluation of the *GA BASICS* program at MCCG.

Population and Sample

Patients utilizing the MCCG Emergency Department (ED) are from both urban and rural areas of central Georgia. The hospital is the second largest in the state and the only level one trauma center in the region. The hospital serves 28 counties surrounding Macon and Bibb County while the Emergency Department services Jones, Bibb, and Twiggs counties (MCCG, 2011). The hospital receives approximately 1000 patients per week into its emergency department. 28% of these patients have private insurance, 21%

use Medicare, 26% use Medicaid, 23% are self payers, and 2% of patients have some other form of insurance.

Currently, SBIRT services are delivered only to patients 18 years of age or older. All patients prescreening positive during triage (described below) are potentially eligible for study inclusion regardless of presenting complaint. From previous studies of emergency department populations, it was assumed that the population of patients entering the MCCG ED was at relatively high risk for having substance use disorders, and the ED's health care workers would have the opportunity to intervene and give advice on risky substance use (Chirpitel, 1999; McDonald et al., 2004). The study included both a quasi-experimental control group as well as an intervention group.

The evaluation study period was divided into a pilot phase and an intervention phase. During both phases, the program used triage nurses to screen for and flag potentially eligible participants. In the pilot phase, control participants were enrolled by the program's Health Education Specialists (HES). The intervention phase began after the HES had been trained in motivational interviewing (MI). In the Intervention phase, the HES administered a risk assessment and performed brief interventions (based on MI) on eligible participants (SAMHSA a). Details on the sampling and enrollment procedures for both groups are described below.

Quasi-Experimental Control Group

The control participants were non-randomly and sequentially assigned. The control group was enrolled between February 2009 and May 2009 prior to the implementation of SBIRT service delivery and prior to training HES in the delivery of motivational interviewing based brief interventions. Though not as strong as a

randomized control trial, the pre-implementation enrollment of the control group ensured that the HES did not use motivational interviewing skills on this group. Patients eligible for enrollment in the study (over 18 and admitting to binge drinking at least one time in the past year and/or using illegal drugs at least once in the past year) were approached by a Health Education Specialist during their ED visit and asked if they would be willing to complete a health survey for research purposes. Patients willing to participate were told that the study involved an initial survey and a telephone survey 6 months after their initial interview for which they would receive a $20 gift card. All participants were consented according to IRB protocol. After completion of the baseline survey, participants were thanked for their time and given standard advice on healthy drinking and drug use habits as well as a list of substance use services in the area. 876 Patients from MCCG were enrolled in the pilot control group, and 522 of these patients were reached to answer a follow up survey at 6 months. Thus, the response rate for the control group was 60%

Intervention Group

SBIRT service delivery began in May 2009. The intervention group sample included in this report was enrolled between May 2009 and April 2010. At this time, the HES had been trained in motivational interviewing (MI) and were performing risk assessments and brief interventions on ED patients with a positive prescreen (see "Procedure" below). A ten percent random sample of patients receiving an intervention was asked if they would be willing to participate in a research project related to health habits. Randomization was based on patient social security number. Patients with the last two digits of their social security number falling between 30 and 39 were eligible for study enrollment. Again, patients willing to participate were told that the study involved

an initial survey and a telephone survey 6 months after their initial interview. Participants were consented for inclusion in the study in accordance with IRB protocol and were mailed a $20 gift card upon completion of the 6-month telephone follow-up. 252 individuals were enrolled for follow up during the study period, and 122 of these participants were reached for the 6 month follow up interview. Thus, the response rate for the intervention group was 48%

Procedure

Twelve full and part time HES (9 FTEs) staff the MCCG ED around the clock conducting assessments, brief interventions, and, when appropriate, provide brief therapy counseling sessions to patients. Intake data for both the control and intervention groups were collected by the MCCG HES. All HES had at least a bachelor's degree in a health related field including public health, counseling, and marriage and family therapy.

HES were trained and certified in motivational interviewing in May 2009 and received ongoing coaching and regular evaluation of their MI proficiency for several months. Coaching sessions utilized tape recordings taken during actual brief intervention sessions in the hospital. The tape recorded sessions were coded by MI experts or coaches who gave HES feedback on the tapes either in person or over the phone.

Initial identification of at-risk patients was accomplished using a 3 question pre-screen administered by nurses during patient triage (Figure 1). The 3 question pre-screen which included the single alcohol screening questions developed by the NIAAA, also inquired about tobacco and illicit drug usage in the past year. The Questions are presented below:

1. Have you used any tobacco products in the past 12 months?

2. How many times in the past 12 months have you had 5 or more drinks in a day (males) or 4 or more drinks in a day (females) ?
3. In the last 12 months did you smoke pot (marijuana) use another street drug or use a prescription pain killer, stimulant or sedative for a nonmedical reason?

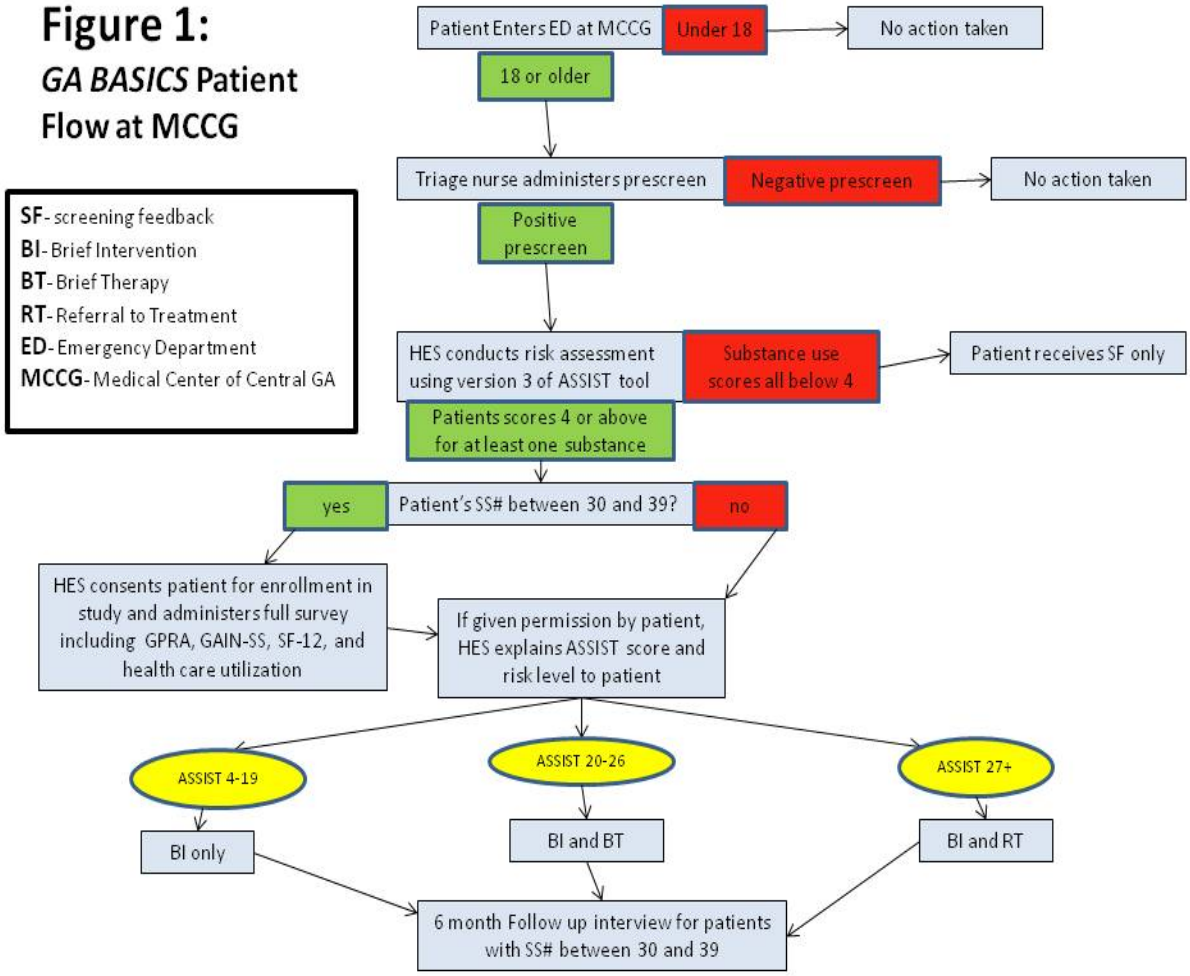
Patients reporting 1 or more binge episodes in the past year (question 2) and/or responding affirmatively to drug use (question 3) were flagged in the system to indicate further screening. This signaled the HES to approach the patient and request permission to administer a more detailed assessment using the Alcohol Smoking and Substance Involvement Screening Test (WHO ASSIST Working Group, 2008).

Patients at MCCG with ASSIST scores lower than 4 were given feedback by the HES. Feedback included telling the patient their ASSIST score and what it represents, giving the patient a positive educational message, and encouraging the patient to continue their healthy behaviors. No further action was taken with these low risk patients, and they were not included in the 6 month telephone follow up. Patients were considered moderate risk if their ASSIST score was between 4 and 19, high risk if their score fell between 20 and 26, and very high risk if their score was 27 or higher.

For patients with ASSIST scores of 4 or higher for alcohol and or any drug use, the HES would ask the patient's permission to talk with them about their substance use, and, if the patient was willing, move into a brief intervention (BI). In addition to incorporating motivational interviewing techniques, HES conducted a BI based on the SAMHSA committee on trauma quick guide: 1.) Give information/feedback 2.) Understand patient's views on drinking/drug use and enhance motivation to change. 3.) Give advice and negotiate. Patients in the high risk group were then referred to brief

therapy, a series of up to 12 free counseling sessions with one of the HES. Patients in the very high risk group would likely need more intensive treatment than what was offered by the HES. Patients in this group were referred to a formal treatment program for additional assessment and possible placement in an appropriate level of care. The flow chart in Figure 1 illustrates the protocol used by the HES at MCCG including the way decisions were made based on ASSIST scores.

Figure 1:
***GA BASICS* Patient Flow at MCCG**



Instruments

The majority of patients receiving SBIRT services received an assessment using the ASSIST and, depending on their score, some additional questions required by the funding agency, SAMHSA. Patients consented and enrolled for follow-up received a more extensive battery of questions comprised of several standardized instruments such as the GAIN-SS (Dennis et al., 2006) and SF-12 (The SF Community) and other questions developed specifically for this study by the GA BASICS leadership team. At intake, all data were collected by the HES while 6-month telephone follow-up data was primarily collected by members of the evaluation team at Georgia State University. Depending on the extensiveness of the patient's drug use history, administration of the full instrument required 15 to 20 minutes. Information about the content of the survey instrument is described below.

ASSIST: The ASSIST Version 3.0 was developed by addiction specialists under the sponsorship of the World Health Organization (WHO). It was designed for use in primary care settings to simultaneously screen for risky use of multiple substances including alcohol, marijuana, stimulants, opiates, and other drugs. The test provides a risk score for each substance being used by an individual. That score ranges from 0 to 39 for each substance and falls into either a "low", "moderate", or "high" risk category (WHO ASSIST Working Group, 2002).

The ASSIST has been through 3 phases of testing in which it was shown to be both reliable and valid when screening for and assigning risk level to substance use (WHO ASSIST Working Group, 2008). Additionally, in a WHO sponsored randomized controlled trial, "an ASSIST-linked brief intervention was effective in getting participants

to reduce their substance use and risk as measured by their ASSIST score"(Humeniuk, 2008). The WHO demonstrated that the ASSIST tool could differentiate between alcohol use, abuse and dependence and was better at distinguishing between use and abuse than at distinguishing between abuse and dependence. Hair samples used to verify the self-report data indicated the validity of the ASSIST. Importantly, it was observed that ASSIST score did not change significantly over time in the absence of an intervention (WHO ASSIST Working Group, 2008).

GAIN-SS: GAIN-SS stands for Global Appraisal of Individual Needs-Short Screener. The GAIN-SS identifies individuals who have one or more of the following psychiatric problems: internalizing or externalizing psychiatric disorders, substance use disorders, or crime or violence problems. The *GA BASICS* survey instrument included all sections except the section on substance use disorders which was already being assessed by the ASSIST. The GAIN-SS can be used for quality assurance within a screening program as well as to measure health behavior change over time (Dennis et al., 2006).

SF-12: The SF-12 is a 12 question screener requiring two to three minutes to complete, and is a modification of the SF-36 with 36 questions. It measures overall mental and physical well-being and is practical, reliable, and valid for use on large populations (The SF Community). Additionally, it has been shown to be adequate for use in longitudinal studies when looking at changes in mental and physical health (Jenkinson, 1997).

Health Care Utilization: In addition to the health services access questions included in the GPRA tool, a series of health care utilization questions, developed by the *GA BASICS*

team, were included in the survey as a means of providing the data needed to conduct a cost-benefit analysis for the program. The questions inquired about ER visits, hospitalizations, urgent care visits, routine checkups, and mental health service utilization. It paired these questions with distance, mode, and time required for travel to these various health care visits.

Social Support and Readiness: The *GA BASICS* team also developed a series a social support questions that included readiness and confidence to change for alcohol, tobacco, and drug use. A readiness to change and confidence to change score, which ranged from 0 to 10, were collected for alcohol, tobacco, and drug use individually. The participants were also asked about the level of support they received from specific family members and friends in helping to reduce the participant's drinking and drug use.

GPRA: In addition to the standardized and validated instruments described above, the survey instrument also included a series of questions, known as the GPRA tool, that are mandated by the funding agency, SAMHSA. GPRA refers to the Government Performance and Results Act (GPRA, 2010). Under GPRA, all SAMHSA programs must collect and report performance data. They are required to develop multi-year strategic plans, annual performance plans, and annual performance reports (SAMHSA c).

The mandated GPRA tool is part of the "National Outcome Measures" and was developed as part of SAMHSA's data strategy. These outcome measures were identified because they would provide valuable information on the effectiveness of substance abuse treatment services in settings across the nation. SAMHSA claimed that these outcome measures would increase program accountability and would ensure that the data collected

be relevant and useful to furthering implementation of clinical trials. Three of the outcomes deal with mental health while the other 7, included as part of the *GA BASICS* survey instrument, are reported to the Center for Substance Abuse Treatment (CSAT). They include:

(1) abstinence from drug use and alcohol abuse, or decreased mental illness symptomatology

(2) increased or retained employment and school enrollment

(3) decreased involvement with the criminal justice system

(4) increased stability in family and living conditions

(5) increased access to services

(6) increased retention in services for substance abuse treatment or decreased utilization of psychiatric inpatient beds for mental health treatment

(7) increased social connectedness to family, friends, co-workers and classmates. (CSAT's GPRA strategy)

Variables

This study is focused on identifying the impact of SBIRT services on patient alcohol use. Measures included questions from the ASSIST tool and the GPRA tool. Both intervention and control participants were asked the same set of questions that will be used in the analysis. The outcome variables of interest are number of binge days during the past 30 days, number of drinking days during the past 30 days, and abstinence from alcohol for the past 30 days . To measure drinking days during the past 30 days, and abstinence from alcohol for the past 30 days, participants were asked "During the past 30

days, how many days have you used any alcohol?" The number of binge drinking days in the past 30 days was captured in 2 questions from the GPRA tool. First, "During the past 30 days, how many days have you had 5 or more drinks in one sitting?" and second, "During the past 30 days, how many days have you had 4 or fewer drinks in one sitting and felt high?" These variables were summed to create a single binge drinking variable.

The main independent variable used in the analysis is intervention status and it was captured by determining whether or not the patient received an intervention. The covariates or potential demographic control variables are gender, age, education level (measured in years of schooling) and race (black vs. non-black). These were captured in the demographic portion of the GPRA tool.

The ASSIST score at baseline or enrollment was determined using questions 2 through 7 of the 7 item tool. Additionally, baseline binge drinking days, baseline drinking days, and baseline abstinence from alcohol will be used in the model as control variables for the outcome of interest. These variables were measured at enrollment and reflect the baseline status of the participant's alcohol use/risk level.

Analysis

Because patients with ASSIST scores less than 4 in the intervention group did not receive a brief intervention, patients with alcohol ASSIST scores of less than 4 were removed from the sample.. Removing these patients from the sample was necessary to facilitate comparison of the intervention and control group participants.

Next, we performed univariate analyses to explore the data for outliers and to test the normality of the outcome variables. We identified outliers in the outcome variables, “past 30 day drinking days” and “past 30 day binge drinking days.” Any values over 30 were recoded to equal 30. We checked normality by measuring skewness and kurtosis and by creating histograms of the variables’ distributions. For non-normally distributed outcomes, we performed Mann Whitney U tests using SPSS to determine any differences in trend or variance between intervention and control groups.

We compared intervention and control participants on several demographic and baseline alcohol use variables using student’s t-tests for continuous variables and chi square tests for categorical variables. We did this to confirm that the two samples were similar at baseline and that there were no potential biases that could impact the results. Then, for each of the two study groups, we used paired samples t-tests to determine any time dependent changes in the outcome variables of interest between baseline and follow up.

To look at the effect of the intervention on reported abstinence at 6 month follow up, we created a dichotomous variable “abstinence” which we coded as “0” for participants reporting no alcohol consumption in the past 30 days and “1” for participants reporting any alcohol consumption in the past 30 days. We used logistic regression to examine the relationship between intervention status and abstinence at 6 months when controlling for abstinence at baseline.

Next, we used multiple linear regression to examine the effect of the intervention on the outcome variables “past 30 day drinking days” and “past 30 day binge drinking

days" at 6 month follow up when controlling for the respective outcome measurement at baseline. The models were tested for interaction between the intervention status variable and the covariates of interest. Continuous variables were mean centered and then multiplied with the intervention status variable to create interaction terms.

Limitations

There are several important limitations that should be noted about the present study. First, there could be issues leading to selection bias in the sample of program participants. For instance, the control group was not randomly enrolled. During the pilot period, HES were instructed to approach any individual entering the ED who had screened positive on the prescreening questionnaire. Several factors could have influenced which patients were approached by the HES during the pilot period including degree of injury/illness and length of hospital stay. Thus, the control participants may have been subject to selection bias by the HES. To alleviate this potential sampling bias, control subjects were compared to intervention subjects on demographics and on other baseline patient characteristics. Additionally, the follow up rate for both the control group and the intervention group is not ideal which could lead to sampling bias. The 6 month response rate for the control group was 60% and the response rate for the intervention group was 48%

Second, the assessment/encounter with the HES could have had an impact on behavior change in both the intervention and the control group samples. For instance, although the control group was enrolled prior to MI training, it should be noted that the majority of HES enrolling them were marriage and family therapists or other counselors.

For this reason, it is hard to ensure that the control group did not receive some type of therapy during their disclosure of substance use at the administration of the study survey. Furthermore, the 20 minute survey assessment could serve as a powerful behavioral intervention in itself. The survey alone could bring awareness to the participant's alcohol or drug misuse and induce behavior change. Even more, the ED visit could act as a powerful motivator of behavior change, and unfortunately, it is impossible to determine which of the above factors contribute to a reduction in alcohol use outcomes in the control sample. At the same time, this limitation can be considered a strength. Because of the inclusion of a control group, it may be shown more definitively how effective the MI based brief intervention is at reducing drinking risk behaviors over and above any effect on behavior change due to the administration of the survey, the ED visit, or regression to the mean.

One aspect unique to the MCCG ED is the high rate of "repeat visits" experienced by the facility. That is, many of the patients entering the ED make frequent visits to the facility. As a result, several of the control group participants may have received a brief intervention before their 6 month follow up interview. Repeater visitors to the ER were tracked by the HES and flagged in the hospital records. This third limitation will be a valuable factor to consider during the analysis. In particular, the percentage of control participants who received a BI before their follow up interview will be reported. There is concern that leaving these patients in the control group for the analysis could bias the findings in the direction of the null hypothesis that there is no difference between the two groups at 6 month follow up on alcohol use outcomes.

Fourth, there could be limitations associated with the survey instrument used for the program's evaluation. While the ASSIST tool has been validated and has evidence to support its accuracy, the GPRA tool, which contains the questions on binge drinking, days drinking and abstinence, has not been formally validated. Furthermore, the variables used to capture binge drinking days for the past 30 days are not ideal. In particular, women were not pointedly asked how many days they had binge drank or consumed 4 or more alcoholic beverages in the past 30 days. They were only asked how many days they had consumed 4 or more drinks in one sitting and felt high from that drinking episode. However, because these questions were asked the same way to both the intervention and control participants, this limitation will likely have little effect on the results.

Finally, the self-report data is certainly a limitation to the study findings and has clear implications for the interpretation of the results. The inclusion of the control group in the analysis should help elucidate any recall bias or regression to the mean associated with the survey. Still, this report can only present conclusions based on participant responses to the survey questions, and the participants who received an intervention may have wanted to please the researchers at follow up by reporting lower alcohol usage.

Results:

We compared patient characteristics at enrollment in the study (baseline) across treatment groups using chi square tests and independent samples t-tests (Table 1). According to the chi square tests, the groups were similar on the categorical variables, age, gender, and race composition. Additionally, the continuous variables, education level, mean ASSIST score at baseline, abstinence from alcohol during the past 30 days, mean number of drinking days during the past 30 days at baseline, and mean number of binge drinking days during the past 30 days at baseline were similar between groups. The results of these analyses indicate that the groups were comparable on all potential control variables at baseline assessment.

During preliminary analyses, we found that the outcome variables, past 30 day binge drinking days and past 30 day drinking days had non-normal distributions. Consequently, we used the Mann-Whitney U test to compare the distributions of the alcohol use outcome variables by intervention status. We concluded that the underlying distributions between the two groups were equal (p= 0.30 and 0.80 for binge days and drinking days respectively). Additionally, we checked the data for outliers and implausible values. We found implausible binge drinking days values that we recoded to reflect accurate numbers.

Table 1. Baseline Patient Characteristics of Intervention and Control Groups

Characteristic	Pilot Control (N=396)	Intervention (N=122)	*p* (chi square, t-test)
Age in years *(95% CI)* *N= 339, 112*	**43.9** *(43.1, 44.68)*	**42.4** *(41.1, 43.7)*	0.34
Gender (%)			
Male	**68.6**	**67.9**	0.91
Female	**31.4**	**32.1**	
Race (%)			
African American	**66.4**	**73.0**	0.24
Non-African American	**33.6**	**27.0**	
Education level in years of schooling *(95% CI)* *N=336, 112*	**11.8** *(11.7, 11.9)*	**11.6** *(9.7, 13.5)*	0.22
Mean alcohol ASSIST score *(95% CI)* *N=334, 97*	**14.9** *(14.4, 15.4)*	**15.1** *(14.1, 16.1)*	0.864
Mean number of drinking days during past 30 days *(95% CI)* *N=337, 110*	**11.7** *(11.1, 12.3)*	**11.9** *(10.9, 12.9)*	0.90
Mean number of binge drinking days during past 30 days *(95% CI)* *N=332, 109*	**7.8** *(6.9, 8.7)*	**7.8** *(7.2, 8.4)*	0.98
Abstinent from alcohol during the past 30 days (%)	**7.3**	**13.4**	0.056

**non-African American was made up of 95% White and 5% Other*

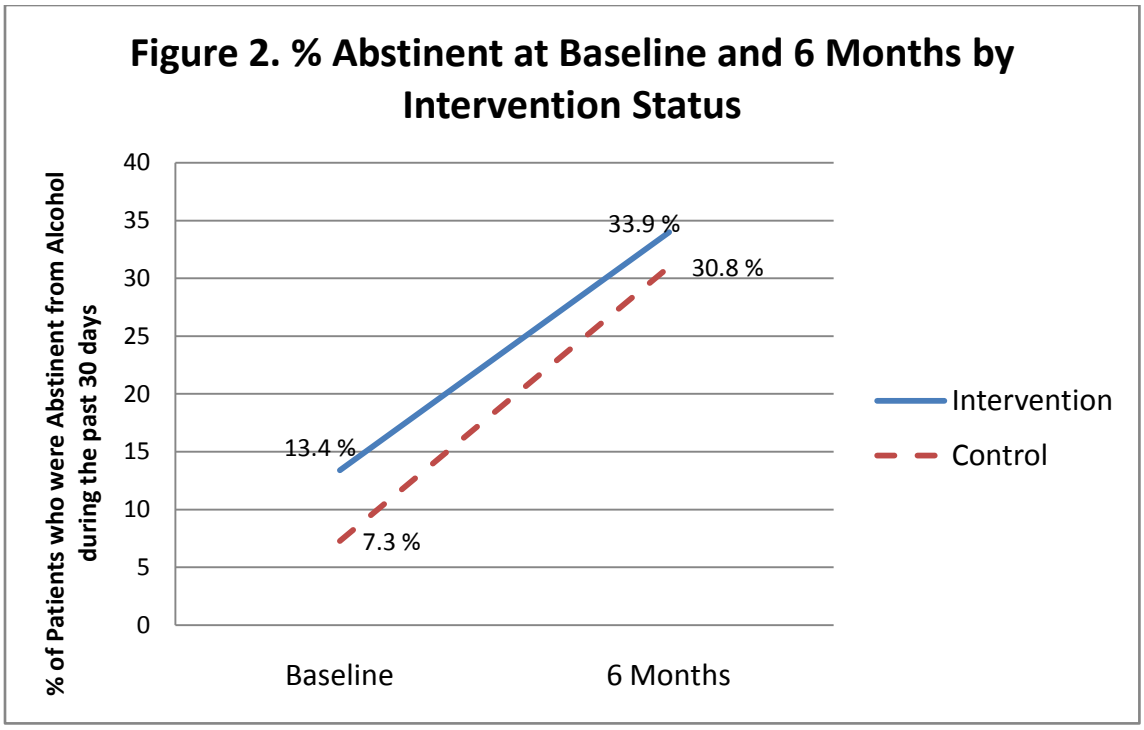
We compared alcohol use outcomes at 6 month follow up across treatment groups using independent samples t-tests. The mean number of drinking days during the past 30 days and the % abstinent from alcohol during the past 30 days did not differ by intervention status at 6 months. The control participants reported an average of 4.9 binge drinking days at 6 month follow up (95% confidence interval was 4.4 to 5.3) while the intervention participants reported an average of 3.0 binge drinking days at 6 month follow up (95% confidence interval was 2.3 to 3.6). These results suggest that the intervention group reported fewer binge drinking days than did control participants at 6 month follow up.

Table 2. Alcohol Use Outcomes of Intervention and Control Groups at 6 Months

Outcome	Pilot Control (N=396)	Intervention (N=122)	*p* (t-test)
Mean number of drinking days during past 30 days *(CI)* *N=379, 106*	**7.1** *(6.6, 7.6)*	**6.0** *(5.1, 6.8)*	0.272
Mean number of binge days during past 30 days *(CI)* *N=356, 103*	**4.9** *(4.4, 5.3)*	**3.0** *(2.3, 3.6)*	0.039
Abstinent from alcohol during the past 30 days (%)	**31.0**	**33.9**	0.531

Impact of SBIRT on Abstinence

For control and intervention patients separately, we performed paired samples t-tests on the difference in percentage of patient's reporting abstinence from alcohol between baseline and 6 months follow up. We observed an increase in reported abstinence for both the intervention group and the control group (Figure 2). The percentage of control participants reporting abstinence increased by 23.5 percentage points from 7.3% at baseline (95% CI for the paired difference was 18.4 to 28.6 percentage points). Similarly, the percentage of intervention participants reporting abstinence increased by 20.5 percentage points from 13.4% at baseline (95% CI was 12.1 to 28.9 percentage points).



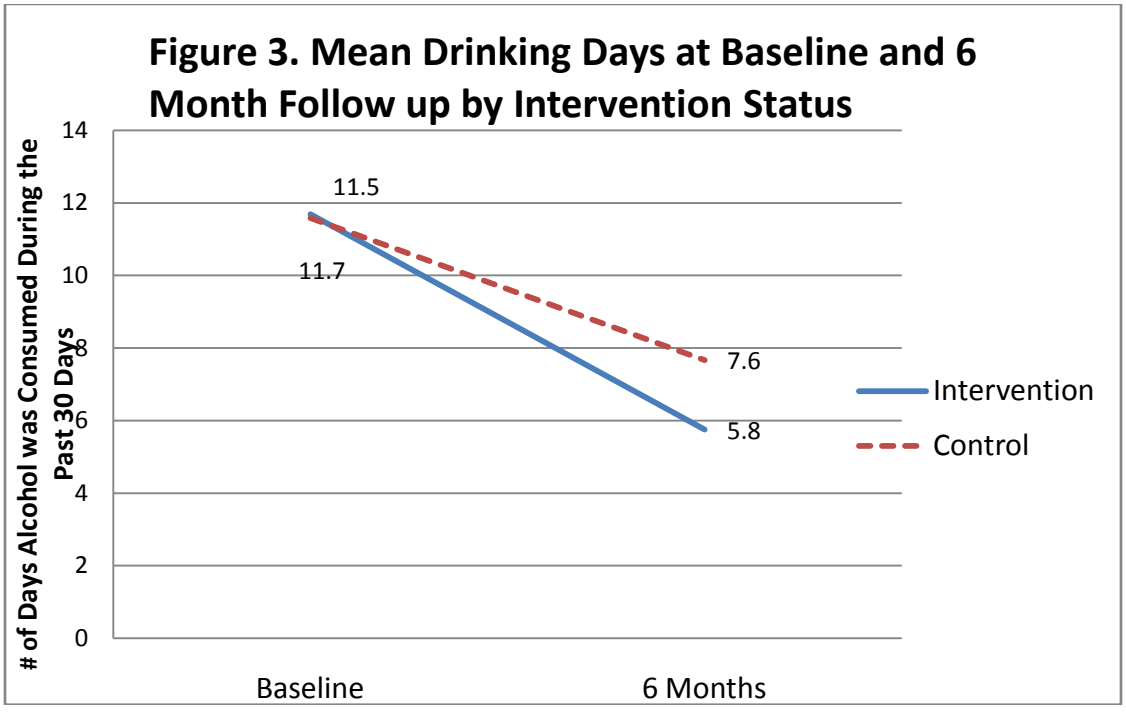
We used logistic regression to assess the relationship between intervention status and abstinence at 6 months, controlling for abstinence at baseline. The point estimate for the intervention status risk ratio or the exponentiated β value was 1.10 (95% CI was 0.85 to 1.35). From information displayed in Figure 2 above and Table 3 below, there is no evidence to conclude that intervention status is associated with reported abstinence from alcohol at 6 month follow up. Specifically, there was no evidence to conclude that patients receiving an intervention were more likely than control participants to report abstinence at 6 months.

Table 3. Association of Intervention Status and Abstinence at Follow Up

Covariate	β	EXP(β)	EXP(β) Confidence Interval	Significance
Abstinent at Baseline	1.16	3.18	2.29 to 4.39	<0.001
Intervention Status	0.068	1.10	0.85 to 1.35	0.77

Impact of SBIRT on Number of Drinking Days during the Past 30 Days

We compared the number of reported drinking days during the past 30 days at baseline and 6 month follow up for both the intervention and the control group using paired samples t-tests (Figure 3). Both groups reported a reduction in the number of drinking days at 6 month follow up. The mean reduction in reported drinking days was greater for the intervention group than the control group. On average, intervention participants reported a decrease of 5.9 drinking days from 11.7 days at baseline (95% CI was 3.9 to 8.0 fewer days). The control group participants reported an average decrease of 3.9 drinking days from 11.5 days at baseline (95% CI was 2.7 to 5.2 fewer days). On average, intervention participants reported 2 fewer drinking days than controls at 6 month follow up. In other words, intervention patients reported 24% fewer drinking days than control participants at 6 months.



We used linear regression to examine the relationship between intervention status and the number of drinking days at 6 months controlling for the number of drinking days at baseline. The results of the regression are displayed in Table 4 below. Because baseline ASSIST score was highly correlated with baseline drinking days ($R^2 = 0.263$), we did not include ASSIST score in the regression analysis. None of the control variables tested added significantly to the model containing intervention status and number of drinking days at baseline. However, when gender was included, the intervention status variable estimate was more precise. For this reason, gender was included in the model.

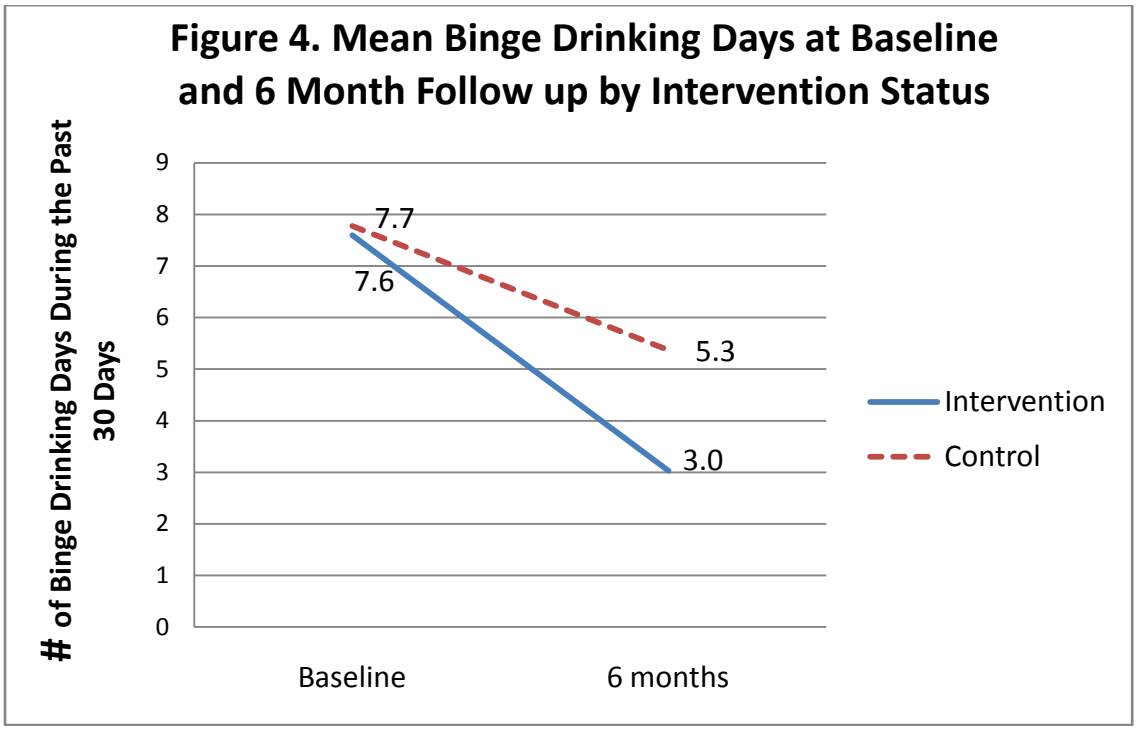
Table 4. Association of Intervention Status and Drinking Days at 6 Months

Variable	β	Confidence Interval	Significance	R^2
Drinking days at baseline	0.382	0.301 to 0.463	<0.001	0.176
Gender	-1.49	-3.34 to 0.364	0.115	0.178
Intervention Status	-1.96	-3.95 to 0.034	0.054	0.184
*Change in R^2 for intervention status = 0.006				

When controlling for gender and the number of drinking days at baseline, the intervention status coefficient point estimate was -1.96 (95% CI was -3.95 to 0.034). When controlling for gender, the reported number of past 30 day drinking days at 6 months was lowered by about 2 days for patients receiving an intervention compared to controls. While there is not conclusive evidence that the number of reported drinking days was reduced more for those patients receiving an intervention than for control patients, the confidence interval for this point estimate could become more precise with a higher sample size.

Impact of SBIRT on Number of Binge Drinking Days during the Past 30 Days

We used paired samples t-tests to compare the number of reported binge drinking days during the past 30 days at baseline and at 6 month follow up for both the intervention group and the control group. Both control participants and intervention participants reported fewer binge drinking days during the past 30 days at 6 month follow up compared to binge days reported at baseline (Figure 4). The control group reported a mean reduction of 2.4 binge drinking days from 7.7 days at baseline (95% CI was 1.1 to 3.7 fewer days). The reported binge drinking days for the intervention group decreased by about 4.6 days from 7.6 days at baseline (95% CI was 2.8 to 6.4 fewer days) Intervention participants reported 2.2 fewer binge drinking days than did controls at 6 month follow up which means they reported 43% fewer binge drinking days than control participants at 6 month follow up.



We used linear regression to examine the relationship between intervention status and binge drinking days at 6 months controlling for binge drinking days at baseline. The results are presented in Table 5 below. A model containing intervention status and binge drinking days at baseline was used to predict binge drinking days at 6 month follow up. In this model, the point estimate of the intervention status coefficient was -2.25 (95% CI was -4.08 to -0.419). Because baseline ASSIST score was highly correlated with baseline binge drinking days ($R^2 = 0.288$), we did not include ASSIST score in the regression analysis.

To assess the possible interactions of patient characteristics and the main effect variable, intervention status, we ran models containing all covariates and their interaction terms. No significant interactions were found. Next, to assess confounding and identify control variables, we ran all possible models containing the covariates age, race, gender, and education level. No models tested produced significant covariates, no models tested changed the intervention status variable estimate by more than 10%, no models tested increased the precision of the intervention status variable, and change in R^2 due to the addition of the intervention status variable was not improved in any of the models tested. Therefore, the model containing intervention status and baseline binge drinking days is displayed below:

Table 5. Association of Intervention Status and Binge Drinking Days at 6 Months

Variable	β	Confidence interval	Significance	R^2
Binge drinking days at baseline	0.265	0.187 to 0.344	<0.001	0.100
Intervention Status	-2.25	-4.08 to -0.419	0.015	0.113
*change in R^2 for intervention status = 0.013				

When controlling for binge drinking days at baseline, we observed that patients who received an intervention reported 2.25 fewer binge drinking days at 6 month follow up compared to control participants (95% CI was -4.08 to -0.419 days).

Discussion:

This study examined the effectiveness of an SBIRT program on alcohol use reduction at an urban hospital in Georgia. The present study and others like it are important because they evaluate the translation of services found to be efficacious in highly controlled trials to applied "real-life" settings. They help us determine the effectiveness of SBIRT services including brief interventions based on motivational interviewing as they are actually used in specific communities and in various hospital populations. *GA BASICS* is particularly important because it is the first of the SAMHSA funded SBIRT programs to use a quasi-experimental control group in its design. Madras et al. (2009) sites the lack of a control group as a major limitation in past SBIRT studies. Moreover, *GA BASICS* is the first SBIRT program implemented in an emergency department setting in Georgia.

As many previous studies have shown, control participants who receive an assessment almost always report reductions in alcohol use (Aseltine, 2010; D'Onofrio, 2008; Longabaugh, 2001; Monti, 1999; Flemming, 1997) The reason/s for this phenomenon is unknown and could include the effect of the ED visit, the survey assessment, regression to the mean, or a desire of the participant to "please" the interviewer at follow up assessment. Thus, it is imperative that studies involving survey measurements of behavior change compare treatment participants to a control group. Because the findings from this report display a reduction in alcohol use outcomes for treatment participants over and above that of control participants, it contains strong evidence that the SBIRT program at MCCG in Macon, GA is effective.

The findings from this study show an effect of the SBIRT treatment on reported alcohol use. Those participants who received SBIRT services including brief interventions, brief therapy, and referral to treatment, reported more than 2 fewer binge drinking days at 6 month follow up compared to controls. This is a 43% reduction in binge drinking days. It was observed that intervention patients reported fewer drinking days than control participants, although there was not enough evidence to conclude that the decrease in sheer drinking days was greater for those participants receiving treatment. Change in abstinence, defined as not drinking at all in the past 30 days, was similar for treatment and control participants.

To be fair, the intervention was not really designed to decrease the days of drinking. As with abstinence, this outcome was examined in the present study to explore and describe changes in alcohol consumption. However, a primary goal of the intervention was to reduce harm associated with at-risk alcohol use (consuming more than the NIAAA recommended daily limit) or drug use. Binge drinking, then, is a better measure of harm reduction in this population of ED patients, and consequently, the observation that binge drinking decreased among the intervention participants was highly indicative of the program's effectiveness.

At the same time, there are several reasons why the estimates for alcohol use behavior change presented in this report are conservative. For one, the sample was taken during the start of the SBIRT program while HES were still being coached and were not as competent in motivational interviewing. Also, included in the sample of control participants were some patients who had received a brief intervention before their 6 month follow up interview. This is because there were large numbers of repeat visitors to

the MCCG emergency department. Some patients that were enrolled in the control group re-entered the hospital at a later date (but before their 6 month FU interview) were approached by an HES and received a BI. If the trend seen in this report holds, these patients would report lower alcohol use at follow up when compared to the other control participants, thus biasing our results towards the null (i.e. diluting the effect of the intervention when compared to the control group). Future analyses will identify these repeat visitors and remove them from the control group.

The evidence favoring SBIRT interventions in emergency room settings presented in this report is limited due to the low follow up rate for both the intervention group (48%) and the control group (60%). However, it has been argued that non-response does not always cause bias (Groves, 2006). In fact, a meta-analysis of 6 SBIRT sites with follow up rates ranging from 25% to 95% supports this belief. The analysis by Madras et al. (2009) did not show any difference in alcohol use behavior change between the studies with low follow up rates compared to those studies with high follow up rates. Thus, the results from this report should not be ignored due to the low follow up rate.

This study explored possible interaction with the intervention. It is valuable to know how SBIRT services work for people with different baseline characteristics including age, race, gender, education level and risk level. We were not able to find any evidence of interaction with this sample of program participants. In effect, the treatment appears to work for everyone regardless of various demographic characteristics.

Because the results are based on self-report data with no biomarker (e.g. Blood Alcohol Level), some may question whether SBIRT services are actually changing behavior and improving health. Prior research has found self-reported drinking behavior

from alcohol abusers to be highly reliable (Sobell, 1979; Williams, 1985; Brown, 1992). Likewise, the impact of self-report should be similar for both the intervention and control groups. Both the intervention and control groups received the same survey at intake and follow-up with alcohol-related questions embedded within other health screening questions making the purpose of the survey less obvious. At the conclusion of the assessment/intervention both groups were also given safe drinking guidelines explaining binge drinking and the reasons for drinking within the recommended limits. On the other hand, while both treatment and control groups were told that they were being enrolled in a "health" study, the nature of the brief intervention could have led treatment participants to infer that they were part of an alcohol and drug use intervention, and to change their answers to the follow up questions accordingly.

Future Directions

There are several ways this study could have been improved. Because self-report data is hard to trust, measuring a biomarker for alcohol use in a small subgroup of the study participants could have strengthened the results. However, time and money constraints would have made this difficult. The study could have randomly enrolled the control participants although, there appeared to be no differences between the control and intervention participants. Finally, we could have removed control participants who had received an intervention before their follow up survey prior to data analysis. This would have given a more accurate measurement of alcohol use behavior change.

In order to strengthen the evidence for the effectiveness of the SBIRT intervention in Georgia, future studies will need to look at other outcomes affected by alcohol use reduction. For instance, if patients are truly drinking less, we would expect to see lower

crime, improved housing status, higher educational attainment, fewer injuries, fewer visits to the hospital/ED, or improved psychological status. The reduction in self-reported binge days is important and suggests behavior change, but for policy to move forward, other outcomes must be investigated.

Perhaps most importantly, we would expect to see a greater reduction in health care costs for intervention participants when compared to control participants. Future studies from data collected through this program will report on a cost-benefit analysis of providing these services to patients entering the ED. The SBIRT program in Washington State saved an estimated $366 per Medicaid patient per month. (Estee et al. 2010) Gentilello et al. (2005) reported a cost savings of $3.81 for every dollar spent on SBIRT services. Cost-benefit research will inform policy makers and could influence the spread of SBIRT services throughout the state.

Motivational interviewing (MI) involves several components such as open-ended questions, rolling with resistance, and non-judgment (Miller and Rollnick, 2002). Upcoming research projects will look at the various components of MI on how they influence patient outcomes. It will be important to measure both the qualities of the Health Education Specialists and their adherence to MI so that researchers may determine a level of fidelity necessary to produce behavior change.

Also on the horizon are studies investigating longer term effectiveness and a dose response of the brief intervention. 18 month follow up surveys will be used to assess long term behavior change. A major challenge will be increased attrition in the sample. People receiving multiple interventions could be used to investigate a dose response of the brief intervention. Unfortunately, additional interventions were not assigned at

random to the sample of participants. In effect, people who frequent the ED were more likely to receive a repeat brief intervention.

The results from this analysis are highly valuable when one considers the study's controlled design. The only known difference between control and intervention participants for this study sample is the receipt of SBIRT services which is the most likely contributor to the considerable reduction in reported alcohol consumption. Consequently, the *GA BASICS* SBIRT program is promising in its ability to change alcohol use behaviors. There is strong evidence that the program is improving patient care and promoting well-being in the population of emergency department patients at MCCG in Macon.

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Appendices:

Dear Joanna,

Thank you for talking to me today about your proposed thesis project for your MSPH at Rollins School of Public Health.

I determined that Emory University is not engaged in your research project because you will be conducting all human subjects research activities entirely at Georgia State University. The project you are working on there, involving a program evaluation of a substance abuse intervention being done at Grady and at the Medical Center of Central Georgia, has IRB approval from the GA State IRB, and you are listed as personnel on that IRB submission. You stated clearly that at no time would you be bringing any identifiable human subjects data back to Emory (or to any non-GA-State site) to work on your thesis. Under OHRP's engagement guidance dated October 16, 2008, section III(b)(8), Emory University is not engaged in this research activity.

The above determination relates to work you are doing specifically for your thesis, which, according to your statements today, consists of comparing survey and follow-up data from control and intervention groups. The data collection itself is not affected by your thesis work, and is being done (or has been done) per the requirements of the GA State project you are working on. You are also involved in some of the data collection as part of your paid employment by the research project (for which you are acting as a paid agent of GA State, not Emory), but that work is separate from the work you will be doing for your thesis.

Please let me know if any of the above is inaccurate.

Thank you,
Rebecca

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