ASSESSING FIDELITY AND USE OF CORE IMPLEMENTATION COMPONENTS IN THE IMPLEMENTATION OF A BRIEF MOTIVATIONAL INTERVENTION TO REDUCE BINGE DRINKING AMONG COLLEGE STUDENTS: A SYSTEMATIC REVIEW OF THE LITERATURE

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Combating excessive rates of binge drinking and alcohol-related harm among college students continues to pose a challenge for public health practitioners and college administrators. While many interventions to decrease binge drinking have proven effective in research settings, these interventions aren't as effective in non-research settings, such as on college campuses, where rates of binge drinking continue to rise. One such intervention, Brief Alcohol Screening and Intervention for College Students (BASICS), has garnered particular attention in both the research realm and among college health promotion professionals. This brief motivational intervention uses a harm reduction approach to decrease binge drinking behaviors and related consequences among college students who drink heavily. Despite extensive research on its efficacy, there have been no published reports documenting the outcome of BASICS when it has been implemented on college campuses. This thesis addressed this gap in the literature by exploring how BASICS has been applied in campus research settings. Specifically, it focuses on the characteristics of the settings and samples, the extent to which the program maintained fidelity to the original evidence-based BASICS program, and the use of seven core implementation components derived from the field of implementation science. These seven components have been identified as crucial processes in the successful uptake of an evidence-based program like BASICS by an organization, such as a university. A systematic review of the

literature revealed that higher levels of program fidelity are associated with positive program outcomes. Additionally, the presence of many or all of the seven core implementation components is associated with higher levels of fidelity and statistically and clinically significant decreases in binge drinking and related harms. Finally, this thesis presents suggestions on how BASICS should be implemented in order to effectively reduce alcohol consumption on college campuses.

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PREFACE

I would like to acknowledge the contribution and support of my thesis committee: Dr. Patricia Documét, Dr. Shawn Brooks, Dr. Beth Nolan, and Dr. Jeanette Trauth. I extend a special thank you to Dr. Nolan for introducing me to the world of implementation science and Dr. Trauth for her tireless effort in helping me make this thesis something I can be truly proud of.

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1.0 INTRODUCTION

High rates of binge drinking on college campuses have proven to be a significant public health concern over the past few decades. Healthy People 2010 established the goal of cutting binge drinking rates among college students in half, from 39% in 2000 to 20% by 2010 (United States Department of Health and Human Services, 2000). Nevertheless, recent data estimates that 40% of college students are classified as binge drinkers, a number that has remained steady since the late 1980's, despite efforts to reduce dangerous drinking and related consequences among this population (Johnston, O'Malley, Bachman, & Schulenberg, 2009).

Heavy drinking on college campuses can result in a variety of negative health, social, academic, and legal consequences, not only for drinkers but for non-drinking students who experience second-hand effects of binge drinking. Physical violence and sexual assault, alcohol overdoses, and unintentional injuries and deaths are some of the more serious health-related repercussions associated with drinking (Wechsler et al., 2002; Hingson, Zha, & Weitzman, 2009). Missing class, falling behind in schoolwork, and poor overall academic performance are frequently cited consequences as well. Less frequently, students report being arrested or getting in trouble with campus authorities, which may arise from such cases as DUI, vandalism, assault, and underage drinking (Wechsler et al., 2002).

Research has identified several factors that are predictive of binge drinking among college students, including history of alcohol use in high school, membership in Greek

organizations or college athletics, and perhaps most importantly, perception of social norms (Turrisi, Mastroleo, Mallet, Larimer, & Kilmer, 2007; Park, Sher, Wood, & Krull, 2009; Neighbors, Lee, Lewis, Fossos, & Larimer, 2007). Various theoretical constructs, several from the Theory of Planned Behavior, have been used to explain binge drinking behavior among college students (Norman & Conner, 2006).

Understanding the determinants and consequences of binge drinking has been useful in the development of several types of interventions. Some interventions are based on correcting misperceived social norms, for example, while others aim to increase self-efficacy for safe drinking behaviors. Research has identified one type of intervention, the brief motivational intervention, as a particularly effective way to decrease alcohol consumption and related harms among heavy-drinking college students. Using a combination of personalized feedback, motivational interviewing, and cognitive-behavioral skills training, this type of intervention attempts to move students along a continuum of behavior change to a point where they are able to consume alcohol safely and in moderation.

Among brief motivational interventions, one in particular has stood out among researchers and college health practitioners; that is, the Brief Alcohol Screening and Intervention for College Students (BASICS). This evidence-based program has demonstrated efficacy in reducing the quantity and frequency of drinking, as well as the harmful effects of drinking, in heavy-drinking college students (Dimeff, Baer, Kivalahan, & Marlatt, 1999). Despite its known efficacy and widespread implementation on college campuses across the country, there is no published literature to date on how BASICS has performed in the real world settings.

1.1 RESEARCH QUESTIONS

One purpose of this thesis is to document how BASICS has been applied in research settings. This includes indentifying the following information for each study: the characteristics of the populations and settings, the outcomes measured, and whether the researcher maintained fidelity to the original evidence-based BASICS protocol, or if they adapted it, how they did so. Furthermore, this analysis of the literature will document which core implementation components, as defined by implementation science, have been used in the applications of BASICS within these college research settings.

Implementation science is a relatively new field of research which explores the methodology that underlies the successful (or unsuccessful) translation of evidence-based practices and programs from the research realm into real world organizations. In their monograph *Implementation Research: A Synthesis of the Literature*, Fixsen, Naoom, Blaise, Friedman, and Wallace (2005) and have identified seven key processes called "core implementation components" that are critical to the successful uptake of an evidence-based program like BASICS.

By investigating how BASICS has been used in research settings and how successful the outcomes were, it is possible to identify which components of the program are crucial in eliciting successful outcomes when the program is implemented in less-controlled real-world settings. According to the literature on implementation, understanding these components is just one step in the process of successfully implementing an evidence-based program such as BASICS. This information informs the second purpose of this thesis, which is to describe, based on Fixsen's model of implementation, how BASICS should be implemented on college campuses in order to effectively change binge drinking behavior.

2.0 BACKGROUND

2.1 DEFINITION AND MEASUREMENT OF BINGE DRINKING

The term *binge drinking* is used to describe an episode of alcohol consumption in which a large quantity of alcohol is consumed in a fairly short period of time, likely resulting in negative effects. Some critics object to the term "binge," saying it connotes a longer duration of alcohol consumption, such as days or weeks and suggest the term "heavy episodic drinking" as an alternative. Other terms for binge drinking include "dangerous drinking," "high risk drinking," and "heavy drinking," although these terms can have slightly different meanings as well (Wechsler & Nelson, 2001). More important than semantics, however, is how binge drinking is quantified.

Binge drinking behavior is measured by the quantity of alcohol consumed in a given period of time. Historically, a quantity of five or more drinks in a row has been the agreed-upon definition for what constitutes a binge. Five drinks in one sitting has been found to be the threshold at which the drinker experiences alcohol-related social and physical harm and others are likely to incur secondhand effects of another person's drinking (Wechsler & Austin, 1998). It is important to note that the definition of a standard drink is 12 oz of beer, 5 oz of wine, or 1.5 oz of hard alcohol (National Institute on Alcohol Abuse and Alcoholism [NIAAA], 2000).

The Harvard School of Public Health conducted a College Alcohol Survey in 1993 that established the "five/four measure" as the standard for assessing the quantity of alcohol consumed (by men and women, respectively) that constitutes binge drinking (Wechsler, Davenport, Dowdall, Moeykens, & Castillo, 1994). The change to four drinks for women takes into account the fact that females absorb and process alcohol more slowly than men, and therefore require fewer drinks to reach the same threshold at which social and physical consequences become meaningful (Wechsler & Austin, 1998). To take this definition one step further, the National Institute on Alcohol Abuse and Alcoholism adopted this definition: "A binge is a pattern of drinking alcohol that brings blood alcohol concentration (BAC) to 0.08 gram percent or above. For the typical adult, this pattern corresponds to consuming 5 or more drinks (male), or 4 or more drinks (female), in about 2 hours" (NIAAA, 2004). Blood alcohol concentration is a measure of weight of alcohol per volume of blood in the body and is directly related to physical and cognitive impairment (NIAAA, 1996).

While there is currently a consensus about the quantity of alcohol consumed during a binge, there is less agreement about the time frame during which these episodes occur. Many researchers use a two-week period to categorize college students as binge drinkers or not. That is, they define binge drinking as "the consumption of five or more drinks in a row at least once in the past 2 weeks for men, and four or more drinks in a row for women" (Wechsler & Nelson, 2001). Others argue that two weeks is too short a time period to correctly classify college students as binge drinkers or non-binge drinkers. They assert that drinking patterns vary week by week and therefore there's great potential to either underestimate or overestimate the prevalence of binge drinking.

One study assessed binge drinking using the 5/4 measurement in the first two weeks of a month versus the second two weeks of a month. It found that up to 50% of students were classified differently across the two time frames (LaBrie, Pedersen, & Tawalbeh, 2007). For this reason, surveys such as the National Survey on Drug Use and Health (NSDUH) define binge drinking as the consumption of five or more drinks in a row at least once during the past 30 days. Additionally, they classify "heavy drinkers" as those who have consumed five or more drinks on the same occasion on each of 5 or more days in the past 30 days" (Substance Abuse and Mental Health Services Administration [SAMHSA], 2009). Clearly there is a need for a standard definition of binge drinking so that direct comparisons can be made across studies.

2.2 PREVALENCE AND TRENDS

Over the past thirty years, rates of binge drinking among college students have fluctuated slightly from year to year, but have remained fairly steady since the beginning of this decade. The most recent data from the Monitoring the Future Study found that 40% of college students engaged in binge drinking in 2008, compared to 43.9% in 1980. Throughout this time period, binge drinking prevalence ranged from 38.5% to 45.4% (Johnston et al., 2009). Data from the National Survey on Drug Use and Health show similar trends and prevalence rates (SAMHSA, 2009). One recent article suggests that alcohol use is still on the rise among college students (Mitka, 2009). Among schools deemed "heavy drinking colleges" by the College Alcohol Study (universities whose binge drinking prevalence is greater than 50%) an average of 55.1% of students are classified as binge drinkers (Nelson, Xuan, Lee, Weitzman, & Wechsler, 2009).

2.3 COLLEGE STUDENTS VS. NON-STUDENT PEERS

Numerous studies have shown that full-time college students in the 18 to 24 year age range have higher rates of binge drinking than their same-age peers not enrolled in college (SAMHSA, 2009; Johnston et al., 2009). The NSDUH estimated that 40.5% of full-time college students were classified as binge drinkers, compared to 38.1% of their non-student counterparts, a difference that is small, but statistically significant (Johnston et al., 2009; Slutske et al., 2004). In addition to the binge classification, college students are also more likely to be current drinkers and extreme binge drinkers, and they report a greater frequency of alcohol use and drunkenness than non-student, same-age peers. This trend may occur because college students have a greater tendency to be Caucasian, from a higher socioeconomic background, not living with their parents, and not married, all of which are independently associated with higher rates of binge drinking (Slutske et al., 2004). Additionally, decreased parental supervision, high availability of alcohol, and social norms that encourage heavy alcohol consumption all lead to the "binge drinking culture" found on many college campuses.

2.4 CONSEQUENCES OF BINGE DRINKING

Binge drinking can result in a variety of health, academic, legal, and social consequences. In 2005, over 1,800 college students died from drinking-related injuries, including burns, gunshot wounds, drownings, and fatal injuries sustained in DUI-related traffic accidents (Hingson et al,, 2009). According to the 2001 College Alcohol Survey, 12.8% of binge-drinking students reported being hurt or injured while drinking and 0.8% of students received medical treatment

for an ethanol overdose. Almost 29% of students, which translates to roughly 3.36 million individuals, reported driving while under the influence of alcohol. Over twenty three percent of students reported riding in a vehicle with a driver who was intoxicated. One in five students engaged in unplanned sexual activity, and 10.4% had unprotected sex while under the influence of alcohol (Wechsler et al., 2002).

At least half of all sexual assaults among college students involve alcohol consumption. This may be an underestimation due to instances in which students were too intoxicated to remember if they consented to sexual activity (Abbey, Zawacki, Buck, Clinton, & McAuslan, 2001). Nearly 20% of students report experiencing unwanted sexual advances by a student who has been drinking and approximately 97,000 cases of sexual assault or data rape are perpetrated by college students under the influence of alcohol each school year (Wechsler et al., 2002; Hingson et al., 2009). Among the victims of sexual assault and rape, half were drinking themselves at the time of the assault and the overwhelming majority are female (Abbey et al., 2001). Alcohol consumption has been shown to increase sexual aggression in men, partly explaining the relationship between drinking and sexual assault. Among females, alcohol inhibits judgment, increases vulnerability to risky situations, and decreases ability to physically or verbally resist sexual advances (Larimer, Lydum, Anderson, & Turner, 1999).

Criminal and legal repercussions can also result from heavy drinking among college students. In addition to DUIs and sexual and physical assaults, alcohol consumption is also associated with vandalism. Over ten percent of binge-drinking students report damaging property while under the influence of alcohol, a misdemeanor crime (Wechsler et al., 2002). Seven percent of binge drinking students report having gotten in trouble with either campus or local

police, resulting in numerous arrests for public intoxication, underage drinking, and public urination, among others (Nelson et al., 2009).

Compared to the general population, college students face unique consequences relating to their schoolwork or studies. Missing class and falling behind in school work are the two most commonly-reported academic consequences of binge drinking (Nelson et al., 2009). Losses of academic or athletic scholarships due to drinking violations or dropping out of school altogether are less frequently associated with drinking among college students.

The secondhand effects of binge drinking on other students can be just as significant. At colleges where heavy drinking occurs, 63% of students reported having their sleep or studying interrupted as a result of another student's drinking. Over half of students who lived on-campus or in a Greek residence said they've had to take care of a friend who was drunk or found vomit in their residence. Over a quarter had been insulted or humiliated by someone who was drinking and 14% had their property damaged. Assault, unwanted sexual advances, and rape are the more serious secondhand effects of other students' drinking, as mentioned previously (Nelson et al., 2009).

There is significantly less information on the long-term effects of binge drinking during the college years. For some students, dangerous drinking behaviors decrease sharply after college with few lingering effects (Perkins, 2002). For others, risky drinking behaviors in college are predictive of alcohol use disorders later in life. Furthermore, some evidence suggests that binge drinking results in poor academic performance, which in turn hinders them from obtaining high-paying, white collar employment once they enter the job market (Jennison, 2004). Understanding the long-term social effects of binge drinking in college is an area that merits further research.

2.5 DETERMINANTS OF BINGE DRINKING

In order to understand binge drinking behavior and create effective interventions aimed at reducing alcohol-related harm it is important to understand the determinants that are associated with the behavior. A considerable amount of research has demonstrated that social norms are a significant predictor of binge drinking among college students (Lewis & Neighbors, 2004; Neighbors et al., 2007; Perkins, Haines, & Rice, 2005). Students' perception of typical peer behavior regarding alcohol seems to be directly related to their own alcohol consumption. The more a student perceives his or her peers to drink, the more the student drinks. Unfortunately, both men and women in college overestimate how much alcohol their fellow students consume. One study found that 75% of college students overestimate how much their peers drink, while another found that students overestimate their peers' drinking prevalence by 6 drinks per week (Lewis & Neighbors, 2004; Perkins et al., 2005).

Several studies have shown that membership in a Greek organization is positively associated with a greater amount and greater frequency of alcohol consumption (McCabe et al., 2005; Park et al., 2009; Scott-Sheldon, Carey, & Carey, 2008). Several possible mechanisms may drive this relationship. It is possible that students who join Greek life already have a predisposition to heavy alcohol use. One study demonstrated that members of Greek fraternities and sororities were nearly twice as likely to have been binge drinkers in high school as non-members (McCabe et al., 2005). The idea of high school binge drinkers self-selecting into Greek organizations is one part of a reciprocally deterministic relationship between Greek students and drinking. Students with a history of binge drinking create an environment where heavy alcohol consumption is the norm, and in turn, the environment provides a setting where drinking is

encouraged. These social norms, in combination with high alcohol availability to members and little adult supervision in Greek housing create a perfect storm for binge drinking.

Involvement in college athletics is another factor associated with increased binge drinking among students (Turrisi et al., 2007). One study suggests that the prevalence of binge drinking among college athletes is approximately 10% greater than the rates in the general college student population, even when controlling for other factors such as race (Ford, 2007). Again, social norms may partially drive this finding, as athletes are more likely than non-athletes to overestimate the amount and frequency of binge drinking by their peers (Yusko, Buckman, White, & Pandina, 2008). Because athletes often form tight-knit and isolated social networks, it might be especially important for them to subscribe to the actions of their reference group.

Additionally, athletes are more likely than non-athletes to report easy access to alcohol and direct drink offers (Turrisi et al., 2007). It's also possible that athletes consume alcohol as a coping mechanism for sports-related stress (Yusko et al., 2008). Finally, athletes are more likely than non-athletes to have been binge drinkers in high school (Turrisi et al., 2007). A wealth of literature has demonstrated that an earlier age of first drinking and binge drinking in high school are significant risk factors for binge drinking in college (Kypri et al., 2009; Reifman & Watson, 2003; Wechsler, Dowdall, Davenport, & Castillo, 1995).

Several theoretical constructs have been used to explain binge drinking among college students (Burden & Maisto, 2000; Read, Lejuez, Wood, & Palfai, 2004; Young, Connor, Ricciardelli, & Saunders, 2006). Outcome expectations, a construct from Social Cognitive Theory, refers to a person's beliefs about the outcome of a behavior and whether this outcome is positive or negative. Students who binge drink tend to emphasize and value the positive outcomes of binge drinking (such as increased sociability or sexual assertiveness) while

minimizing the negative outcomes (for example, hangovers and missing class.) Among researchers in this field, outcome expectations are often called alcohol expectancies.

Self-efficacy, also from Social Cognitive Theory, is another predictor of binge drinking. Not surprisingly, students who exhibit high self-efficacy for binge drinking, drink more heavily (Norman & Conner, 2006). Some studies measure self-efficacy of drinking refusal, which measures a person's confidence and ability to refuse drinks, particularly in social situations. People who have higher self-efficacy in this arena have lower reported rates of binge drinking. On the other hand, lower self-efficacy in refusing drinks, which is related to a higher number of perceived barriers, is associated with increased binge drinking (Von Ah, Ebert, Ngamvitroj, Park, & Kang, 2004).

The Theory of Planned Behavior (TPB) has often been used to explain binge drinking behavior among college students. Attitude, a construct of TPB, addresses a person's subjective feeling toward a behavior. Not surprisingly, having a positive attitude towards binge drinking is associated with a greater quantity and frequency of binge drinking, as well as with greater intention to drink (Burden & Maisto, 2000; Norman, Bennett, & Lewis, 1998; Norman & Conner, 2006). Conversely, a positive attitude towards limiting alcohol consumption is associated with lower levels of binge drinking (Cook, Sniehotta, & Schuz, 2007).

A second TPB construct, perceived behavioral control, has also been applied to binge drinking among college students. Lower perceived behavior control is predictive of more frequent binge drinking (Cooke et al., 2007; Norman & Conner, 2006). Studies show that perceived behavior control is low when the locus of control is external to an individual. That is, when there are factors in the environment that facilitate drinking and overpower a person's self-control and self-efficacy in not drinking. Environmental cues like celebrating a friend's birthday,

being at a nightclub, and living with heavy drinkers are all factors that facilitate binge drinking, lowering a person's control over whether or not he or she chooses to drink (Norman et al., 2008).

2.6 INTERVENTIONS

Interventions aimed at reducing rates of binge drinking and alcohol-related harms in college students have taken many forms. They vary with regard to who is conducting the intervention, what the setting is, and what specific outcomes they are trying to attain. Interventions can be facilitated by peers, for example, or by clinicians. They may take place in a group setting, via the internet, or on an individual basis. Some interventions attempt to reduce binge drinking rates in the entire population, while others are aimed specifically at heavy drinkers. The diversity of interventions makes it difficult to sort them into categories, though there are a few broad classifications that appear frequently in the literature.

Some interventions are based solely on binge drinking education and awareness. Examples of these types of interventions include the distribution of educational pamphlets or programs that teach students the risks of binge drinking. Sending students a 21st birthday card encouraging them to promote safer drinking practices is a strategy that has been used at many universities. The literature shows, however, that these types of interventions are not effective at changing drinking patterns or alcohol problems. While knowledge is a necessary component in changing behavior, it is certainly not sufficient on its own (Larimer & Cronce, 2007; Werch, Pappas, Carlson, DiClemente, Chally, & Sinder, 2000).

Other interventions target social norms as the mechanism through which they promote behavior change. Because many students tend to overestimate how much alcohol their peers

consume, these interventions work to correct misperceived norms. Social norms interventions can take the form of social marketing messages that are communicated to the whole student body. At one campus, a campaign touting the message "Most students drink 0 to 4 drinks when they party" was launched in an attempt to disperse information on the true norm. Unfortunately, nearly three-quarters of students did not believe this message, and the campaign was found to be ineffective in reducing drinking rates (Polonec , Major, & Atwood, 2006).

Some social norms interventions work by using personalized normative feedback. In these types of interventions, students provide information on their own drinking patterns, behaviors, and perceived norms, and are then given information on true campus-wide norms. This feedback highlights the discrepancy between the student's behaviors, what he or she thinks others are doing, and what others are actually doing. The feedback can be given face-to-face in a group or individual setting, through the mail, or via the web. One study found that web-based feedback was most effective and in-person feedback had mixed success, depending on the outcome of interest. Personalized Normative Feedback has been found to be very effective in changing social norms, slightly effective in decreasing frequency and peak BAC, but not very effective in decreasing the number of students who binge drink (according to the 5/4 definition). Additionally, these interventions are really only effective in the short term (Moreira, Smith, & Foxcroft, 2009). Personalized normative feedback can also be used as one technique within a more comprehensive intervention.

Brief motivational interventions (BMI) constitute another broad category of alcohol interventions for college students. Aimed at heavy drinkers, these interventions are typically delivered in one or two short sessions and use motivational interviewing as a strategy to increase a student's readiness to change alcohol use. Like many social norms interventions, brief

motivational interventions use personalized feedback (based on self-reported data) to summarize a student's drinking patterns, peak BAC, risk factors, perceived norms, etc (Schaus, Sole, McCoy, Mullett, & O'Brien, 2009). When given in person (as opposed to through the mail or via the internet), this feedback can be used as a starting point in discussing a student's readiness to change their behavior, as well as an opportunity to correct misperceived norms (Borsari, Murphy, & Carey, 2009).

Many brief motivational interventions include cognitive-behavioral skills training which provides students with the strategies to reduce their dangerous drinking behaviors (Dimeff et al., 1999). Examples include pacing drinks to one per hour, eating a hearty meal before drinking, and other techniques to decrease alcohol consumption and related harm. Cognitive-behavioral skills training also helps students recognize situations and events that may trigger high-risk drinking behaviors. In general, brief motivational interventions have been fairly effective in reducing high-risk drinking behaviors, at least in the short-term (Borsari et al., 2009).

2.7 BRIEF ALCOHOL SCREENING AND INTERVENTION FOR COLLEGE STUDENTS (BASICS)

Among the many binge drinking programs targeting college students, one in particular has garnered the attention of researchers and practitioners alike. Brief Alcohol Screening and Intervention for College Students (BASICS) is an evidence-based brief motivational intervention that aims to reduce alcohol misuse and related harms among heavy-drinking college students aged 18 to 24 (Dimeff et al., 1999). Initial research supporting BASICS showed that students in the BASICS group consumed less alcohol and drank less frequently at six-month follow-up

compared to controls. At two-year follow-up, students who completed BASICS drank less and experienced fewer drinking-related problems than those in the control group, however at four-year follow-up only drinking-related problems were significantly lower in the BASICS group compared to the control group (Baer et al., 1992; Marlatt et al., 1998; Baer et al., 2001).

BASICS has received national recognition from the Substance Abuse and Mental Health Services Administration as a model program and its effectiveness has been reviewed, rated, and documented in SAMHSA's National Registry of Evidence-based Programs and Practice. This registry independently rates the quality and readiness for dissemination of programs that have a scientific basis in preventing and treating mental health and substance use disorders (SAMHSA, 2010). BASICS is one of many programs that falls under SAMHSA's SBIRT approach to health care delivery. Screening, Brief Intervention, and Referral to Treatment are the three components of SBIRT and are used as an early intervention for people who are experiencing or are at risk for experience substance abuse or mental health disorders (SAMHSA Center for Substance Abuse Treatment, 2010).

BASICS uses a harm reduction approach to decrease risky drinking behavior among college students and the negative consequences that are associated with such behavior. Using motivational interviewing, the therapist (sometimes referred to as the interventionist or facilitator) attempts to motivate the student to think about and change his or her behavior, with success viewed as any progress along the continuum of change, not necessarily abstinence or the achievement of an ultimate goal. BASICS is conducted in a one-on-one setting between the therapist and a student client in a non-confrontational and nonjudgmental way, with the student ultimately making the decision on whether or not to alter his or her behaviors. The therapist does

not need extensive training beyond what is included in the BASICS manual, though basic counseling skills such as empathy and active listening are essential to the success of the program.

Like other brief motivational programs, BASICS uses cognitive-behavioral skills to change students' drinking behavior. The cognitive behavioral approach identifies which behaviors need to be changed and teaches the student techniques to make the change, for example setting drink limits and rehearsing drink refusal skills to increase self-efficacy. Students are taught to recognize the contexts in which risky drinking occurs and are provided with accurate information on alcohol. Strategies to cope with internal and social pressure to engage in risky drinking are also presented.

The BASICS format consists of two 50-minute "interviews" between the therapist and the student. The first session, called the "initial assessment interview" is an opportunity for the therapist to collect information on the student's drinking behaviors, for example how much the student drinks during a typical week, in what context the student drinks, and what motivates him or her to drink. The therapist and student also discuss the related harms that the student has experienced as well as risk factors for alcohol misuse such as family history of alcohol problems or comorbid substance abuse. It is important that the therapist begins to build rapport with the student from the moment the session begins in order to elicit the participation and commitment of the student.

After the initial session (or if it's more convenient, before the initial session), the student fills out a questionnaire on alcohol behaviors, attitudes, expectancies, perceived norms, and the negative effects he or she has experienced as a result of drinking. This self-reported data adds to and reinforces the information that was gathered during the first session. In the two weeks between the first and second session, students are instructed to self-monitor their drinking,

detailing when, where, what and how much they drank, as well as the context and the mood they were in.

During the second session, or the "feedback interview," the therapist gives the student personalized feedback, often in graphical form, on his or her behavior. They review the student's peak BAC, for example, and drinking quantity and frequency in relation to the behaviors of other college students. This session also provides an opportunity for the therapist to present accurate facts about drinking and the cognitive-behavioral skills mentioned earlier. Together, the therapist and student discuss the self-monitoring exercise, brainstorm strategies to reduce risky drinking, and address any potential barriers to behavior change.

BASICS is typically delivered in only two sessions, although follow-up visits may be scheduled as needed to assist students who have relapsed. One of the advantages of BASICS is that, although the manual details a specific protocol for delivering the program, there is some flexibility in how it can be implemented. For instance, it can be delivered in one session or two, and by a clinician, peer interventionist, or someone else who is trained in BASICS.

2.8 IMPLEMENTATION SCIENCE

The success of an evidence-based program, such as BASICS, is dependent not only on the quality of the program itself, but on how well it is implemented in the real world. Research settings provide an ideal, controlled environment, but college campuses offer quite a different atmosphere. Insufficient resources, inadequately trained staff, and a lack of support from community stakeholders all act as barriers to the successful implementation of even the most efficacious evidence-based programs (Fixsen et al., 2005).

Fixsen's research on implementation has established two key focus areas that are important the successful implementation of an evidence-based program. First, the critical elements of the program itself need to be identified. That is, which parts of the program are vital to the success of the program and which parts can be adapted to suit the needs of the organization implementing it? Research on a given program can identify some of these critical elements, though it may take several attempts at real world application of a program to assess, essentially through trial and error, which elements of a program are absolutely necessary and which can be modified to fit the needs of the implementation site. In an attempt to identify these critical elements, this thesis will describe all the studies that have employed BASICS, and explore in what ways they have maintained fidelity to or deviated from the original program protocol. Examining the outcomes of the studies will provide a clue as to which elements are integral to the success of the program.

The second key to the successful implementation of an evidence-based program like BASICS is the utilization of core implementation components. This set of processes helps guide implementation and ensures the successful uptake of the program by the organization. The literature has identified these seven core implementation components as: staff selection, preservice & inservice training, ongoing consultation and coaching, staff evaluation, program evaluation, facilitative administrative support, and systems interventions (Fixsen et al., 2005, p. 29). These components are illustrated in Figure 1.

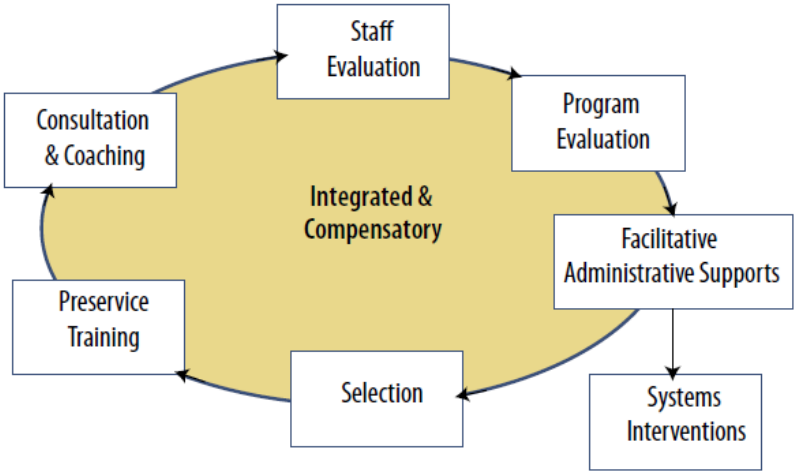

Figure 1. Fixsen's Core Implementation Components

2.8.1 Staff selection

Staff selection refers to the hiring or selection from within the organization of individuals who possess the desired skills, educational background, and personality characteristics to deliver a specific program, either as a practitioner or supporting staff member. Due to resource constraints, this component is often overlooked and organizations use existing staff members instead of hiring more highly-qualified individuals. In selecting staff for BASICS programs, particular attention should be paid to candidate's empathy, ability to intervene in a non-confrontational nature, and past experience with motivational interviewing (Dimeff et al., 1999).

2.8.2 Preservice and inservice training

When implementing a new program, even the most talented and skilled staff members require training to understand the theory behind the program, the rationale for using it, the skills to evaluate it, and the values associated with it. Training typically consists of workshops or other

didactic teaching sessions in which staff learn the skills they will use during the program. Experts in motivational interviewing typically train BASICS interventionists and the training may last from a single session to a multi-week training. Information on the history of BASICS, the physical effects of alcohol, university-specfic social norms, and the benefits of using a harm reduction approach should be presented during the training process.

2.8.3 Ongoing consultation and coaching

Ongoing consultation and coaching are different from training in that they teach skills on the job as opposed to in a classroom or through a workshop. According to literature on implementation, a coach has four major roles when working with program practitioner: supervise, teach while engaged in practice activities, assess and provide feedback, and provide emotional support (Spouse, 2001). Conducting an unfamiliar program can be a daunting task for a practitioner, but the presence of a coach can alleviate anxiety and provide a sense of comfort. It also presents an opportunity for a master practitioner to note a novice practitioner's skills and later provide both praise and constructive criticism in order to enhance the skills of the interventionist, which in turn should lead to more effective program outcomes.

2.8.4 Staff evaluation

Staff evaluation is needed to assess the performance of practitioners and support staff and is essential for quality improvement efforts. Evaluating staff performance can provide insight on how well the selection, training, and coaching phases were carried out and improvements to any step of the implementation process can be made to enhance staff skills if necessary. The staff

evaluation component also measures the fidelity with which the practitioner is carrying out assigned tasks. A skilled practitioner not only utilizes core intervention components (compliance fidelity), but uses these components in the correct manner and in accordance with evidence-based protocol (competence fidelity.) Staff evaluation should not be used as a proxy for program evaluation, which assesses how well the program is operating at the level of the organization and how closely the program is adhering to protocol.

2.8.5 Program evaluation

Fidelity measures also take place at the organizational-level and are part of program evaluation. This component evaluates whether the organization has created a context in which the evidence-based program will be able to thrive and achieve the expected positive outcomes. It includes, for instance, the assessment of coach to practitioner ratios, the training completion rates, and whether the needs for certain resources are being met (Fixsen et al., 2005). With respect to BASICS, program evaluation can assess the need for more interventionists, assure that all paperwork is being completed correctly, and measure the degree of client satisfaction with the program.

2.8.6 Facilitative Administrative Support

Facilitative administrative supports keep staff organized and focused on achieving the program's goals and supports the overall process from adoption of a program to sustainability. The success of a program like BASICS relies not only on the person delivering the session, but on all the people and processes that go into developing and maintaining the intervention. Establishing

leadership roles, setting clear objectives, and setting up decision-making processes at the organization level are all part of this component.

2.8.7 Systems interventions

Finally, systems interventions include working with external partners to assure that funding, human resources, and other organizational needs are met. Collaboration with university administrators, mental health service providers, campus police, and budget makers are integral to the successful implementation of a program like BASICS.

2.8.8 Other elements of successful implementation

In addition to critical program elements and core implementation components, Fixsen has identified the use of a purveyor as essential in successful program implementation. A purveyor is an individual or group who acts as a communication link between the people representing a program (the original creators of BASICS, for example) and the people trying to implement it. The purveyor's job is to ensure that the core intervention components are being adopted at the local implementation site and generally to ensure that the program is implemented smoothly and effectively. With the help of the purveyor, an implementation site can learn to be self-sufficient in carrying out the core intervention components, such as training and evaluation.

3.0 METHODS

The purpose of the literature search conducted for this thesis was to identify articles that have described the application of BASICS in its entirety or one of the main components, individually, or as part of a larger research intervention. Once the articles were identified, the studies were broadly described in terms of their targeted populations, recruitment strategies, campus settings, and outcomes of interest. The articles were then individually classified based on level of fidelity to BASICS protocol and each program was described in further depth. Finally, the articles were analyzed for the inclusion of one or more core implementation components.

3.1 INCLUSION CRITERIA

Prior to 1999, "BASICS" was a nameless, ongoing project at the University of Washington and not yet a manualized, evidence-based program which could be replicated by other researchers. For this reason, only articles published during or after 1999 were included for analysis. In order to meet inclusion criteria, studies had to specifically mention the use of BASICS by name or citation, thus excluding other brief motivational programs. While some studies replicated BASICS in its entirety, others mentioned the use of one of its major components, which was satisfactory for inclusion, provided the article noted the component was based on or adapted from BASICS. For example, Larimer et al. (2007) conducted a feedback program with college

students, noting that “feedback content and style were similar to the Brief Alcohol Screening and Intervention for College students (BASICS) program.”

Although the researchers who developed BASICS note its applicability with various populations and diverse health behaviors, only studies which utilized BASICS as an alcohol program with college students were included as relevant. BASICS programs aimed at heavy-drinking adolescents do not fit within the scope of this thesis. Similarly, BASICS programs intended to decrease marijuana or other drug behaviors did not meet the inclusion criteria.

3.2 EXCLUSION CRITERIA

Meta-analyses and reviews were excluded, as they mostly provided information on original research studies that were already identified through the literature search process. Reviews did, however, provide a secondary means of ensuring that all relevant studies had been found through the literature search. Also excluded were the original studies conducted at the University of Washington that provided the evidence base for BASICS. Summaries of symposia proceedings were excluded, as were articles that were accessible only by paying a fee. Finally, international studies using non-U.S. College students were excluded, as U.S. college students may differ from students in other nations in their drinking behaviors, motivations, and alcohol-related harm.

3.3 ARTICLE RETRIEVAL

Three databases were used to locate relevant articles: PubMed, CINAHL, and Academic Search Premier. PubMed, despite its focus on biomedical and life science literature, is a useful resource for locating articles associated with addiction and addictive behaviors, research trials, and behavioral interventions, all of which relate to BASICS. The CINAHL database was used to retrieve articles relating to nursing and allied health professions, as alcohol programs such as BASICS can be conducted by mental health counselors, clinical psychologists, or public health practitioners. Finally, Academic Search Premier was used to find articles from science and social science journals.

To begin the retrieval process, a search of the phrase “brief alcohol screening and intervention for college students” was performed in PubMed, yielding 23 articles, 10 of which were relevant for inclusion. The second PubMed search included the terms “brief motivational intervention(s)” AND “college” AND “alcohol.” Both the singular and the plural of “intervention” were used, as each of these words provides different results. This search resulted in a total of 47 articles, 9 of which were relevant, but only 3 new articles not in the first search. Finally, a search of “brief intervention(s)” AND “college” AND “alcohol” was performed, returning 158 articles, but only 1 that was new and relevant.

The same three searches were performed in the CINAHL database, giving rise to a total of 31 articles, all of which had been found through the previous PubMed search. Using Academic Search Premier, the three searches yielded 119 articles, only one of which was new and included in the total number of relevant articles. Overall, 15 articles were identified through a search of the literature, each employing the BASICS program in one form or another.

After reading all fifteen articles, three of them were removed from analysis because of their dissimilarity from the other twelve. The three deleted studies were different in that they were measuring something other than alcohol consumption and related behavior as the primary outcome. Although the three articles in question did implement BASICS in the research setting, one explored discrepancy-based psychological processes of behavior change, one investigated clinical outcomes using a complex statistical process, and the other focused on the small nuances of motivational interviewing techniques.

4.0 RESULTS

The purpose of this analysis is to describe studies that have implemented the BASICS program in its entirety or studies that have implemented one component of BASICS independently or as part of a larger program. A total of 12 articles, including one case study, met the inclusion criteria and were considered for analysis. In keeping with the research questions, the results of this analysis will describe: how BASICS was implemented in college research settings, the characteristics of the settings and target populations, and how well the program maintained fidelity to the original BASICS protocol as established by Dimeff et al. (1999). This analysis will also identify which, if any, of the core implementation components were applied throughout the implementation process. The hypothesis is that if a program is implemented with fidelity resulting in expected outcomes, one would expect many, if not all, of Fixsen's core implementation components would have been present. A summary of the twelve articles can be found in Table 1 in the Appendix.

4.1 TARGET POPULATIONS

In line with the objectives of BASICS, all identified programs were targeted towards college students in the hopes of preventing or reducing risky alcohol use and related consequences. Of the twelve studies, one utilized BASICS as a universal prevention strategy aimed at all students,

regardless of drinking status or alcohol-related harms (Larimer et al., 2007). Two other studies targeted groups who were at risk for alcohol misuse and negative consequences, but who were not necessarily problem drinkers. Turrisi et al. (2007) targeted incoming college freshman who had been athletes in high school and Larimer et al. (2001) focused on male students who were part of a fraternity pledge class.

The other nine programs recruited participants who self-reported a history of binge drinking and/or alcohol-related harm. Most of these studies utilized the gender-specific 5/4 definition to assess binge drinking, though one simply used participants who were in the upper 33% of the screening pool in terms of number of drinks per week (Murphy et al., 2001). The Alcohol Use Disorders Identification Test (AUDIT) was a common instrument used to identify students with unhealthy alcohol behaviors and the Rutgers Alcohol Problem Inventory (RAPI) was most often used to assess alcohol-related harms.

4.2 SETTINGS

The campuses where these research programs were implemented were diverse in terms of geography, size, and public or private status. Universities from the West Coast, Midwestern, Northeastern, East Coast and Southeastern United States were all represented. Most were reported as having large student bodies, two were medium-sized, and one was identified as small. All were co-educational, four-year institutions. One was identified as a liberal arts school, one a Jesuit college, and three were identified by name: Auburn University, Rutgers University, and Boston University. A mix of public and private institutions was represented, as well as both urban and suburban campus settings.

4.3 RECRUITMENT

A range of recruitment strategies were reported across the studies described here. As is typical with research studies conducted with students on college campuses, three studies recruited students from a large, introductory psychology course. Two other studies specifically recruited students who had been mandated to receive an alcohol program because of a campus alcohol violation. The intention of these studies was to investigate whether BASICS maintained its effectiveness when program participants were required to take it as opposed to volunteering to take it. Another two studies recruited participants from the student health clinic in order to assess the feasibility of a screening and brief alcohol program in this setting. The remaining studies used a list of registered students, provided by the registrar, as a sampling frame. These students were recruited via US mail or their university e-mail accounts.

4.4 OUTCOMES

Only studies that included alcohol consumption patterns or alcohol-related harms were included for analysis in this thesis. Alcohol consumption (both quantity and frequency) was measured in multiple ways both within and across studies, including average number and peak number of drinks per week, quantity of alcohol per drinking occasion, number of binge drinking episodes in past 30 days, and number of times drunk in a typical week. Seven studies used students' self-reported measures of alcohol consumption, along with information on weight and sex, to calculate typical and/or peak blood alcohol concentration (BAC.).

Both the Alcohol Use Disorders Identification Test (AUDIT) and Rutgers Alcohol Problem Inventory (RAPI) were used to assess drinking behaviors or alcohol-related harms in a number of studies. The AUDIT has been validated among diverse populations, including college students, and has consistently proven effective in screening for a variety of alcohol use disorders (Reinert & Allen, 2007). The RAPI is a 23-item self-report questionnaire measuring alcohol-related harm that has demonstrated both reliability and validity in clinical and non-clinical samples of young adults (White & Labouvie, 1989). All outcomes were measured at baseline and at follow-up assessments, which occurred anywhere from six weeks to twelve months among the studies.

Some studies also investigated the presence of mediators and moderators to explain the relationship between completion of the BASICS program and reductions in alcohol use. Changes in perceived norms, the use of protective behaviors, and positive and negative alcohol expectancies were all evaluated as specific mechanisms of change that could possibly drive the association between the program and drinking outcomes. Changes in perceived norms, for example, were shown to mediate the relationship between the BASICS intervention and decreases in alcohol consumption in one study (Neighbors, Lewis, Bergstrom, & Larimer, 2006).

4.5 USE OF BASICS

In order to provide further detail on how BASICS was incorporated into each research program, the twelve studies were categorized based on how well they maintained fidelity to the original BASICS protocol. Although the creators of BASICS highlight the flexibility of the program, for example which parts can be adapted as a function of time or resource constraints, these

adaptations do not have the same evidence basis as the original BASICS program. For that reason, categorizing these studies' level of fidelity is based as upon comparisons to the BASICS protocol as outlined by Dimeff et al. (1999) in *Brief Alcohol Screening and Intervention for College Students: A Harm Reduction Approach.*

It should be noted that only two of the twelve studies employed the two-session design that is described in the BASICS manual (White et al., 2006; Schaus et al., 2009). Protocol suggests that the program be delivered over the course of two 50-minute sessions, spaced roughly two weeks apart. During the first session (the "initial assessment interview"), the interventionist collects information about the student's alcohol use, and then provides personalized feedback and tips during the second session (the "feedback interview"). In most of the research studies, only an abbreviated "feedback interview" was conducted with a BASICS therapist, based on information that participants provided at baseline to determine study eligibility. None of the studies employed the self-monitoring activity that typically occurs between the two sessions.

4.5.1 Low fidelity

Three studies demonstrated relatively low fidelity to the original BASICS program. Neighbors et al. (2006) randomized 214 heavy-drinking college students into a personalized normative feedback program "modeled on the normative feedback component" of BASICS or an assessment-only control group. In a research lab, all students completed an online baseline assessment of their drinking behavior as well as perceived norms of other students' drinking behavior. Those in the program group immediately received a printed, personalized feedback report at the conclusion of their assessment, while those in the control group received nothing. At

the two-month follow-up, analysis showed that students who received feedback had significant reductions in average number of drinks per week ($p < .05$) compared to controls, but there were no differences at follow-up in alcohol-related harm.

Larimer et al. (2007) also conducted a feedback-only program with a large group of college students who were not necessarily problem drinkers. All study participants completed an online baseline assessment of their alcohol consumption patterns, perceived norms, alcohol-related consequences, and protective alcohol behaviors. The 737 students in the program group were subsequently mailed their feedback. The feedback "content and style were similar to the Brief Alcohol Screening and Intervention for College Students" and included a personalized summary of their behaviors, normative comparisons, peak BAC calculations, alcohol expectancies, and experienced consequences.

Additionally, students in the program group were mailed 10 weekly postcards containing educational information on alcohol, social norms messages, and other statistics associated with risky drinking. At follow-up 12 months later, students who received the program had a significant reduction in a number of drinking measures compared to controls, but again, there were no differences between the groups for negative consequences. Additionally, self-reported abstainers at baseline were significantly more likely to still be abstainers one year later if they received the program.

Finally, Saitz et al. (2006) conducted a web-based program in which freshman with "unhealthy alcohol use" (determined by AUDIT scores) were subjected to an online brief program that was "based on elements of BASICS." The program was essentially an online feedback report, which calculated students' BAC, provided them with a graphic profile of their experienced consequences, and provided normative data on alcohol. Drinking guidelines,

dependence symptoms, and referral information were also presented. For males, there were no significant changes in alcohol behaviors, though females in the program showed some modest, yet significant decreases in number of drinks per week and number of heavy drinking episodes ($p < .05$ for both measures). In addition to changing alcohol behaviors, this program tested the feasibility of conducting a screening and brief intervention online. Over 4,000 freshmen were invited to participate in this program, roughly half completed the initial assessment, 650 were eligible for the brief program based on AUDIT scores, and 235 actually completed the program.

4.5.2 Medium fidelity

Three research studies displayed slightly more fidelity to the BASICS protocol, but did not fully replicate the original BASICS program. Larimer et al. (2001) evaluated a BASICS-like program with fraternity members who had just begun the pledging process. These students had not necessarily shown signs of alcohol misuse or related harms; however their Greek affiliation put them at high risk for developing problematic alcohol behavior. One hundred twenty participants from twelve different fraternities completed a written baseline assessment of their alcohol behaviors, drinking norms, and readiness to change. Six fraternities and their participating members ($n = 77$) were randomly assigned to receive a one-hour, individually-tailored feedback and skills session. The other six fraternities and their participating members ($n = 82$) received no treatment at all.

Participants in the program group received feedback on personal alcohol behaviors, consequences, and perceived and actual norms in a non-confrontational way using the techniques of motivational interviewing. Cognitive-behavioral skills were also taught. In addition to the individual feedback sessions, the six fraternities whose members were randomized to the

program group received a one-hour house-wide feedback session. Compared to controls, men in the BASICS group had a significant reduction in average number of drinks per week and typical peak BAC ($p < .05$) at the 12-month follow-up. There were no significant differences in the quantity of alcohol per occasion, drinking frequency, symptoms of alcohol dependence, or negative consequences. The authors noted that, despite statistically significant reductions in some drinking measures, overall drinking rates remained high.

Turrisi et al. (2009) also implemented BASICS with a novel component added to the original program. In this study, BASICS was combined with a parental program to see if this combination was more effective in reducing drinking and related harm among athletes than BASICS alone. Again, this program was not aimed at heavy-drinking college students, but rather incoming freshmen who were at risk for alcohol problems because of their athletic status. The BASICS part of the program was implemented according to the manual, using peer athletes to conduct the one-hour feedback session on personalized behaviors, norms, and cognitive-behavioral skills. The parental component required parents to discuss with their college-bound child the effects of alcohol, ways to engage in safer drinking, and strategies to resist peer pressure, among other tips. The only measure on which the combination program outperformed the BASICS-only program was in reduction of alcohol-related consequences.

A brief motivational program conducted by White et al. (2006) with 222 mandated college students was similar in format to BASICS in that students participated two sessions with a trained counselor; one session to assess drinking behaviors and consequences, the other to discuss feedback, norms, personal risk factors, and cognitive-behavioral strategies. The sessions were similar in content to BASICS, but each only lasted 30 minutes as opposed to the 50-minute interviews suggested in the BASICS manual. What really distinguishes this program from the

original BASICS is that students' cigarette use and drug use, as well as alcohol use, was assessed and discussed throughout the program. In this study, the 118 students who received the BASICS program demonstrated a significant reduction in total number of drinks per week, number of occasions of heavy drinking in the past month, and both drug- and alcohol-related harms at the four-month follow-up compared to the 104 students who received a written feedback-only program.

4.5.3 High fidelity

The following six studies were rated highly in terms of their fidelity to the original BASICS protocol. Each of these studies utilized the key components of BASICS: motivational interviewing in a one-on-one setting, personalized feedback which assessed drinking behaviors, experienced consequences, norms, and risk factors, and cognitive-behavioral skills training to increase self-efficacy for moderate drinking. Additionally, the samples for each of these studies were composed of heavy-drinking college students – the target group for whom BASICS was originally developed.

In 2000, Borsari and Carey randomized 29 heavy-drinking college students to a brief motivational program adapted from the BASICS handbook. These students had all reported two or more binges (using the 5/4 measure) within the past month. The program was conducted by a clinical graduate student who used MI to review personal alcohol use, consequences, and norms. Positive alcohol expectancies were challenged and accurate information was provided to debunk common drinking myths. Cognitive-behavioral skills training was used to help students identify and avoid high-risk drinking situations and the therapist provided the students with options to decrease risky drinking. At the six-week follow-up, students who received the BASICS program

drank significantly less than the control group on the three measured drinking indices – number of drinks per week, number of drinking occasions in the past month, and frequency of binge drinking in the past month ($p < .01$ for all measures.) There were no differences between the program group and the assessment-only control group ($n = 31$) in terms of negative alcohol problems.

Murphy and colleagues (2001) replicated the "feedback interview" of BASICS with 30 undergraduate college students. To be eligible for the study, students had to rank in the upper 33% of screened participants in number of drinks per week and had to report two or more alcohol-related problems from the RAPI. The program was conducted by a grad student clinician and included all the elements detailed in the BASICS manual. Overall, there were no significant group differences between the BASICS group, a group who received an education-only program ($n = 29$), and the control group ($n= 25$). The heaviest drinkers in the BASICS group (that is, those who consumed 25+ drinks per week and binged at least 3 times per week) did have greater reductions in number of drinks per week and number of drinks per week at both 3- and 9-month follow-ups. This suggests that heavier drinkers may have more to gain from BASICS than other students. Additionally, students in the BASICS group rated their program more favorably than students in the education-only group.

In another study by Borsari and Carey (2005), 64 students from two different universities in the same metropolitan area were randomized to a BASICS-like program or an education program. All participants had been mandated to an alcohol program because of a drinking violation, had self-reported two or more binges in the past 30 days, and were determined by the AUDIT instrument to be high-risk drinkers. Both programs were carried out by the study's principal investigator and occurred in a one-on-one format. At the six-month follow-up, there

were no significant differences between the two groups in their drinking habits, though the researchers noticed a trend in drinking reduction for both groups, and a trend toward decreasing alcohol-related problems, especially in the BASICS group.

Two studies evaluated the efficacy of conducting BASICS within a college student health center. Both Martens et al. (2007) and Schaus et al. (2009) recruited students who visited the student health clinic, regardless of the services they were seeking. In the Schaus et al. study, students were questioned about their alcohol behavior as part of a health history and screening tool. Those who reported at least one 5/4 binge in the past two weeks and agreed to participate were eligible for the study. A total of 363 students were randomized to a BMI modeled after BASICS (n = 181) or a services-as-usual control group (n = 182).

Those in the BASICS group attended two twenty-minute sessions that were scheduled two weeks apart. Both sessions were conducted by an MI-trained health center clinician (physician, nurse practitioner, or physician assistant) and took place at the student health clinic. It should be noted that of the twelve studies included for analysis, this was one of only two studies that utilized the two-session format as it was originally developed. The first session focused on building rapport with the student and initiating a conversation about alcohol use using a personalized feedback document. The second session focused mainly on building cognitive-behavioral skills. Compared to controls, students in the BASICS program showed significant short-term decreases in typical and peak BAC, peak number of drinks per sitting, number of drinks per week, and number of times drunk per week. While these group differences were evident at the 3- and 6-month follow-up, they had diminished by the 9-month follow-up. A reduction in alcohol-related consequences persisted until the 9-month follow-up, but this too, was not significant at the 12-month follow-up (Schaus et al., 2007).

Martens et al. (2007) determined eligibility based on AUDIT scores of students who presented to the university health center or university counseling center. Among the 175 students who agreed to participate, baseline data was collected via an online assessment. Students met with a clinician from the counseling center who was trained in BASICS and the pair discussed personalized feedback, norms, accurate information on alcohol consumption and strategies for behavior change. Although there was no control group, students who received BASICS had a significant reduction in number of drinks per week ($p < .001$), peak drinking ($p < .001$), and heavy episodic drinking ($p = .002$) compared to baseline assessment six weeks earlier.

The final study included in this analysis is a case study of a heavy-drinking college sophomore who reported drinking 28 drinks a week, reached a peak BAC of .39, and endorsed experiencing at least 9 alcohol-related problems. As part of a research study, she completed a baseline assessment of her drinking behaviors, consequences, and perceived norms. During the 50-minute feedback session the student received her personalized feedback report, discussed norms with the peer interventionist, examined alcohol expectancies, explored her motivation to change, and learned harm-reduction strategies. Although it is inappropriate to calculate statistics on a one-person case analysis, a general improvement in the student's alcohol consumption behavior was noted. She reduced her weekly consumption to 22 drinks per week and at one-month post-program and to 11 drinks per week by the three-month follow-up. Although her peak number of drinks remained high, she reduced her number of binge drinking occasions from eight times a month at baseline to three times a month at follow-up. Her peak BAC and number of negative alcohol-related consequences also decreased.

4.6 CORE IMPLEMENTATION COMPONENTS

Core implementation components play a considerable role in the success of evidence-based programs such as BASICS (Fixsen et al., 2005). The twelve studies being analyzed were evaluated for the presence of each of the core implementation components, as defined by the implementation literature: Staff Selection, Preservice and Inservice Training, Ongoing Consultation and Coaching, Staff Evaluation, Program Evaluation, Facilitative Administrative Support, and Systems Interventions

Neither the three low-fidelity studies nor Whiteside et al.'s (2010) case study explicitly addressed any of the core implementation components. The remaining eight studies are discussed with regard to their description of core implementation components. Although Fixsen calls for implementing an evidence-based program with high fidelity, the medium fidelity studies are included in this analysis because they resulted in outcomes that were equally as effective as the outcomes from high fidelity studies. A summary of the core implementation components that were addressed in these studies can be found in Table 2 in the Appendix.

4.6.1 Staff selection

In researching the efficacy of a program, the interventionist is often one of the research investigators, a graduate student, or other individual who can be conveniently recruited. The therapists selected to conduct the BASICS program in each of these eight studies were no exception; they were chosen, in part, out of convenience and willingness to participate. In Larimer et al.'s (2001) implementation of BASICS with fraternity pledges, peer therapists were undergraduate psychology majors who were recruited via fliers and posters on campus. Turrisi et

al.'s (2009) program used undergraduate student or entry-level graduate student athletes who showed an interest in the research project as BASICS therapists. Three studies used existing university health care or mental health care practitioners and the others used members of the research team, typically doctoral students in clinical psychology programs.

In sum, none of the studies *explicitly* addressed the staff selection component, as it is defined by the literature on successful implementation. One can argue, however, that BASICS staff were selected based on some characteristic or qualification, so in truth, each of the eight studies did employ this component. They simply failed to describe the selection process in detail. Both studies by Borsari and Carey (2000; 2005), for example, selected the principal investigator to facilitate the program. Assuredly, the PI was chosen because of his prior experience with BASICS and motivational interviewing, and not simply out of pure convenience.

4.6.2 Preservice and inservice training

Five studies provided modest to extensive detail on how their BASICS therapists were trained in preparation for the programs. The five college-student peer interventionists and two professional research staff members who facilitated BASICS among fraternity members each received eight to twelve hours of didactic training (Larimer et al., 2001). The peer interventionists who conducted BASICS with college athletes were all trained by clinical psychologists and counselors through didactic presentations, role playing exercises, written materials, and videos over the course of ten weeks (Turrisi et al., 2009). In White et al.'s (2006) investigation of BASICS with mandated college students, two existing university counselors received training in BASICS and motivational interviewing.

The four clinicians who conducted BASICS in a student health center each received eight hours of education in motivational interviewing, the components of BASICS, and cognitive behavioral skills training though the NIAAA's "Clinical Protocols to Reduce High Risk Drinking in College Students." They also engaged in role playing and behavioral rehearsal (Schaus et al, 2009). In conducting BASICS in a university mental health center, Martens et al. (2007) utilized pre-doctoral and doctoral level staff members who were "trained in BASICS" to facilitate the program and also offered a two-day workshop on BASICS for the rest of the counseling center staff. The workshop consisted of several seminars from both external consults and internal staff members who were familiar with the BASICS program and included mock BASICS sessions.

Both studies by Borsari and Carey (2000, 2005) used the principal investigator of the research project as the BASICS therapist, but neither mentioned the extent of training he had received. The final BASICS program was conducted by clinical psychology graduate students who "all had prior experience with BASICS," but again, no further detail was given on the type or amount of training (Murphy et al., 2001). Like the staff selection component, however, it is assumed that a training element was present in each study, as BASICS could not result in successful outcomes if the facilitator had no knowledge of the program or how to conduct it.

4.6.3 Ongoing consultation and coaching

Unlike training, which occurs prior to facilitating a program, consultation and coaching is characterized by on-the-job instruction. Supervision, teaching while engaged in practice activities, assessment and feedback, and provision of emotional support are the four broad practices carried out during coaching (Fixsen et al., 2005). Four of the studies reviewed included a coaching component, which was typically described as supervision and feedback.

Each of the therapists who facilitated BASICS with fraternity members engaged in one or two supervised interviews (Larimer et al., 2001). Likewise, the therapists who conducted BASICS with mandated students received weekly supervision from a clinical psychologist who was trained in motivational interviewing (White et al., 2006). A clinical psychologist also supervised randomly-selected BASICS sessions in two other programs (Borsari & Carey, 2000; Murphy et al., 2001).

4.6.4 Staff evaluation

According to Implementation Science, staff evaluation is used to assess the practitioner's ability to perform the skills that were taught in training and reinforced through coaching. In the case of BASICS, this generally refers to the use of motivational interviewing techniques such as active listening and reflection in a manner that is non-threatening, non-judgmental, and empathetic. Because the majority of the BASICS program relies on the performance of the therapist, it's the actions of the therapist which determine fidelity of the program at the session level. Five of the eight studies under analysis performed staff evaluation in one form or another.

Three studies used an outside coder or coders to evaluate the therapist's fidelity in carrying out the components of BASICS. In the program with college athletes, every BASICS session was audiotaped and later coded to assess the therapist's use of MI techniques, interviewing spirit, and other behaviors (Turrisi et al., 2009). In both studies conducting BASICS with mandated college students, randomly-selected sessions were audiotaped to evaluate the therapist's use of MI techniques as well as the degree to which the therapist adhered to other BASICS protocols (Borsari & Carey, 2005; White et al., 2006). Borsari and Carey (2005) also

used the audiotapes to rate the therapist's egalitarianism, affect, engagement, and other characteristics based on *Motivational Interviewing Skill Code: Coder's Manual* (Miller, 2000).

Two studies required the BASICS therapists to evaluate themselves as a way of ensuring integrity to program practices. The clinicians who facilitated BASICS at a student health center were required to complete a checklist of the motivational interviewing skills and other BASICS components that they had utilized during each session. The clinicians then reviewed this checklist with the motivational interviewing expert who had trained them and received feedback and skills reinforcement as needed (Schaus et al., 2009). The therapists in White et al.'s (2006) program also had to self-evaluate their tasks, empathy, and nonjudgment after each BASICS session.

A final way of rating staff performance was through participants' evaluation of their therapist's skills. Four studies included participant evaluations of their overall experience, but only two asked participants to rate their therapist's competence (Murphy et al., 2001) or empathy and motivational interviewing skills (Schaus et al., 2009).

4.6.5 Program evaluation

Program evaluation assesses "key aspects of the overall performance of the organization to help assure continuing implementation of the core intervention components over time" (Fixsen, 2005). Because the studies under analysis were all research projects there was a relatively well documented outcomes evaluation for each study. In addition to these outcomes, two studies used participant evaluations as a means of evaluating the BASICS program. In one study, participants were asked to rate their overall satisfaction with BASICS and whether or not they would recommend it to another person (Borsari and Carey, 2000). In another study, participants rated

the program with regard to interest, personal relevance, clinician competence, effectiveness in reducing risky drinking behaviors, and overall satisfaction (Murphy et al., 2001).

4.6.6 Facilitative administrative support and systems interventions

Like program evaluation, both facilitative administrative support and systems interventions are organization-level implementation components. None of the studies under analysis overtly described the presence of either administrative support or systems interventions. Like the staff selection and training components, however, the presence of these two core implementation components is implicit. All research studies, regardless of the nature of the research, require facilitative administrative support in order to carry out the study's logistical objectives. Various staff are needed to recruit participants, process paperwork including approval from local institutional review boards, and create the online program that assesses student drinking behavior. Scheduling BASICS appointments with participants, procuring advertised incentives, and reserving a physical space to conduct the program are all examples of facilitative administrative support.

Similarly, systems interventions are inherently built in to research study protocol. At the very least, the investigators of all of these studies had to collaborate with the funding source and the university at which they implemented BASICS. In some cases, the researchers forged partnerships with the student health or counseling services in an attempt to either recruit participants or select staff to facilitate the program.

5.0 DISCUSSION

The extent to which each of the twelve BASICS programs maintained fidelity to the original protocol had clear implications for the success of the program. Essentially, higher levels of fidelity, especially the inclusion of the three critical elements (motivational interviewing, personalized feedback, and cognitive behavioral skills training) resulted in better outcomes. The use of core implementation components also appears to be related the success of BASICS. Among the high fidelity studies, between four and seven of Fixsen's core implementation components were present. In some cases, however, their presence was implied rather than explicit. Although greater use of core implementation components is associated with better outcomes in terms of binge drinking behaviors, it is indeterminable whether these components actually cause the positive outcomes. More likely, successful outcomes result from a combination of the use core implementation components, fidelity to BASICS, and characteristics of the student population.

Still, because the twelve studies under analysis implemented BASICS in a research setting, it's impossible to determine from these studies exactly how crucial a role these core implementation components play in real-world implementation. Future research is needed to determine how core implementation components are being applied at universities where a BASICS program has been implemented and sustained and how these components affect the success of the program.

5.1 EFFECTIVENESS OF PROGRAMS

5.1.1 Low fidelity studies and effectiveness

Studies characterized as having low fidelity to BASICS appear to be the least effective in reducing binge drinking behaviors and related negative consequences. This is hardly surprising given that the documented effectiveness of BASICS is driven by its combination of personalized feedback, motivational interviewing, and cognitive-behavioral skills training. To remove one or more of these critical elements clearly has implications for the effectiveness of the program.

The studies by Neighbors et al. (2006), Larimer et al. (2007) and Saitz et al. (2006) were rated as having low fidelity because they only incorporated the personalized normative feedback component of BASICS. None made use of an in-person session or the motivational interviewing techniques that BASICS is built upon. There were no attempts at promoting readiness to change and cognitive-behavioral skills training was not utilized, although the Larimer et al. (2007) did send postcards with strategies to engage in moderate drinking. BASICS' target audience is college students who have already experienced or are at high risk of experiencing the negative effects of alcohol misuse, yet Larimer et al. (2007) took a universal prevention approach. Although these three programs showed some success, the effectiveness was modest and there were no reductions on alcohol-related harm, which is a primary intended outcome of BASICS. Generally speaking, conducting only the feedback portion of BASICS with non-risky drinkers appears to have little long-term impact on students' alcohol consumption and no impact on alcohol-related consequences.

Among these three studies, the failure to find statistically significant differences in pre- and post-intervention measures of binge drinking seems to represent a true lack of behavior

change. Although all three mention low response rates and lack of generalizability as a limitation, none had particularly small sample sizes. In fact, Larimer et al.'s (2007) study of mailed feedback included over 1,400 participants, the largest of all BASICS studies under analysis in this thesis.

5.1.2 Medium and high fidelity studies and effectiveness

Medium and high fidelity studies resulted in much better outcomes than studies which demonstrated low fidelity to the BASICS protocol. The difference in the success of medium fidelity versus high fidelity studies, however, appears small. The three medium fidelity studies were characterized as such not necessarily because they lacked one of the three critical elements, but because of smaller components that were added or changed.

For example, although Larimer and colleagues (2001) implemented their BASICS program with fair accordance to protocol, the added component of the house-wide feedback session and the use of a population that had not yet experienced alcohol problems and negative consequences distinguish it from the original BASICS program. Furthermore, among the 77 participants in the BASICS program group, 17% were actually mailed their feedback as opposed to meeting with the interventionist in a one-on-one setting. Similarly, in Turrisi's study with athletes, the added parental component, the target population of athletes which had not necessarily experienced drinking problems, and the fact that students who were unable to meet for an in-person session were mailed their feedback classify it as a medium fidelity program. Interestingly, both of these studies found that mailed feedback was just as effective as feedback that was delivered in person, suggesting the mode of delivery is less important than the actual provision of feedback.

Even the highest fidelity studies show mixed success in reducing binge drinking behaviors. Within a study, some drinking measures decreased as a result of the program, while others remained steady. For example, a program may effectively reduce typical BAC but have no effect on peak BAC. Are these findings sufficient to conclude that the program is effective? Although many of these research programs found statistically significant reductions in binge drinking behaviors or alcohol-related harm, the clinical significance remains questionable.

5.1.3 Best practice

The two studies with, arguably, the best outcomes were White et al.'s (2006) medium fidelity study of mandated college students and Schaus et al.'s (2009) high fidelity study of students recruited from a student health clinic. Both studies found significant decreases in measures of alcohol consumption and related consequences that were sustained over the course of several months, a lengthy program effect time compared to many other studies. Examining characteristics of these studies may shed some light on best BASICS practices. Interestingly, these two studies were the only ones which employed the two-session format. White's study used university mental health counselors as therapists and focused on both drug and alcohol use disorders. The program utilized a group format for the first session and the sample was composed of students who had experienced negative repercussions as a result of their drinking (a campus drug or alcohol violation). Schaus' study used existing clinicians from the student health center to facilitate the BASICS program and intervened on a population of self-reported binge drinkers. Both studies included the three critical elements of BASICS - personalized feedback, motivational interviewing, and cognitive-behavioral skills training.

5.1.4 Other BASICS program elements and effectiveness

Other components, such as the setting, interventionist, and the length of the program seem to be less important to BASICS' effectiveness. Mandated students, as well as those who volunteered for BASICS, both saw reductions in binge drinking behaviors. Professional therapists and peer facilitators were also equally effective, and shortened, single-session programs appear to be just as efficacious as the longer, two-session format. Studies that were housed within university health centers saw reductions in alcohol consumption and harms, suggesting this as a feasible and convenient setting to implement a BASICS program. White et al. (2006) conducted BASICS in a group setting instead of using a one-on-one format and documented significant reductions on alcohol consumption and consequences. Group-level BASICS programs could conceivably stretch university resources much further than the one-on-one format, but possibly at the expense of the rapport and interaction between the therapist and clients and further research on this topic is merited.

5.2 USE OF CORE IMPLEMENTATION COMPONENTS

It was hypothesized that studies which maintained high fidelity to the BASICS protocol and resulted in decreased levels of alcohol consumption and related harms would have implemented many or all of Fixsen's core implementation components. For the most part, this hypothesis was confirmed. None of the low fidelity studies described the use of any core implementation components. Among high fidelity studies, the number of components used ranged from four to all seven. As previously mentioned, the use of some components was explicitly stated in certain

cases, while their presence was simply implied in others. It is additionally possible that some components were neither explicitly stated nor implied, but were present and were simply left out of the study description due to oversight or length requirements of particular journals. See Table 1.

Table 1. Use of Fixsen's Core Implementation Components Among High Fidelity* Studies

Author	Staff Selection	Training	Coaching	Staff Evaluation	Program Evaluation	Facilitative Administrative Support	Systems Interventions
White et al. (2006)	I	E	E	E	I	I	I
Borsari & Carey (2000)	I	I	E	E	E	I	I
Borsari & Carey (2005)	I	I		E		I	I
Martens et al. (2007)	I	E				I	I
Murphy et al. (2001)	I	I	E	E	E	I	I
Schaus et al. (2009)	I	E		E	I	I	I
Whiteside et al. (2010)	I	I				I	I

***White et al.'s (2006) medium fidelity study was included in this table because of its particularly significant decreases in alcohol consumption behaviors and because it differed from BASICS protocol only in that it added a cigarette and drug assessment and feedback element.**

Legend:
E = use of core implementation component explicitly stated
I = implied presence of core implementation component

Core implementation components were used more frequently in medium and high fidelity studies than in low fidelity studies, suggesting these components might be associated with more successful programs. The study by Schaus et al. (2009) and the study by White et al. (2006),

which arguably resulted in the most meaningful and sustainable decreases in binge drinking and related harm, used six and seven of the core implementation components, respectively. This suggests that using all seven of the components is not crucial for the success of an evidence-based program. As Fixsen states, “weakness in one component can be overcome by strengths in other components” (Fixsen, et al., 2005). As an example, if an organization is unable to perform on-the-job coaching because of financial or human resource constraints, extra attention can be paid to the preservice training component.

5.3 RECOMMENDATIONS

In addition to describing how BASICS has been implemented, one purpose of this thesis is to describe how BASICS can and should be implemented on college campuses in order to achieve clinically significant reductions in alcohol consumption and related harm among college students who drink heavily. Despite finding that BASICS can be fairly effective without the use of all of Fixsen’s core implementation components, it is recommended that the components be used in order to maximize outcomes to their full potential.

With regard to staff selection for a BASICS program, experience with motivational interviewing and the ability to counsel students in a nonjudgmental and non-threatening manner is more important than educational background. It is essential to selected individuals who hold credibility with college students. And the pros and cons of using peer interventionists versus professional counselors should be weighed carefully. Staff selection criteria apply not only to BASICS therapists, but to their trainers, coaches, and support staff.

Regardless of who is facilitating the intervention, it is crucial that the individuals be properly trained. The amount of time spent on training can vary as a function of time and resource allotments, provided the staff gains an understanding of the rationale underlying the BASICS program and demonstrates the ability to use the skills associated with BASICS, particularly motivational interviewing. Training can take many forms, from lectures to manuals to workshops, and role play and behavior rehearsal are essential so that constructive feedback can be provided by the trainer. Specific to BASICS, training should include information on university-specific social norms, the biphasic response of alcohol, how to calculate BAC, risks for and symptoms of alcohol dependence, and what resources are available to students who may have an alcohol use disorder. Staff should also be trained to use any computer software or interfaces that are used to collect information on students' alcohol consumption as part of the personalized normative feedback component.

According the Fixsen, the "train-and-hope" approach is only slightly more valuable than not training at all. To successfully deliver a program, training must be complemented by on-going coaching and consultation that occurs while a practitioner is delivering the BASICS program. Coaching can increase practitioner confidence in using the skills learned during training and can serve as an opportunity for the coach to assess the practitioner's skills, especially motivational interviewing skills. The coach can serve as an on-the-spot reference and source of comfort until the practitioner feels confident enough to deliver BASICS alone. Even expert practitioners, however, should receive periodic consultation to ensure they are maintaining fidelity to the BASICS program and all of its elements. BASICS is typically delivered in a one-on-one format, a coach may disrupt the dynamic between the therapist and client, so coaching may best be provided through listening to audio or video tapes of the session.

Like coaching, both staff and program evaluation provide a platform for quality improvement. Evaluation, in combination with adequate staff training, can also ensure that an evidence-based program like BASICS is being conducted with fidelity, the importance of which has been demonstrated throughout this thesis. Staff competence can be assessed by both clients and independent evaluators and should include evaluation of empathy, active listening, and other MI skills as well as the ability to gain rapport with the client, and knowledge of basic alcohol information and norms. The evaluation of evidence-based programs ensures that objectives are being met, resources are being properly procured and used, and that all core intervention and core implementation components are being employed. Client satisfaction surveys are one way of measuring a program's performance, though program evaluation requires more extensive assessment of the organization's fostering of the program.

Although none of the twelve research studies reviewed in this thesis made use of facilitative administrative support or systems interventions, both are integral to the successful implementation of a program like BASICS and should be considered by universities who are implementing BASICS either currently or in the future. Facilitative administrative support can be characterized as any activity or policy that helps foster an evidence-based program such as BASICS. Allocating adequate funds to BASICS, holding weekly staff meetings addressing program goals, and encouraging staff attendance at relevant regional and national conferences are all examples of support that facilitate implementation and sustainability.

The need for systems interventions highlights the importance of collaboration among stakeholders in any evidence-based program. University administrators and budget-makers need to be involved with implementation to assure adequate financial and human resources to BASICS. Partnerships with university and community based health, mental health, and substance

abuse treatment centers are necessary for clients whose alcohol use problems stretch beyond the scope of BASICS. If BASICS is being used as a program for mandated students who violate campus alcohol policies, representatives from campus police and judicial affairs should play a role in the implementation process as well.

In addition to the seven core implementation components, BASICS should be implemented with as much fidelity as possible, with the understanding, however, that a small amount of flexibility in the program's format may still result in successful outcomes. Some elements, however, are essential to BASICS' success, such as the use of personalized normative feedback, motivational interviewing, and cognitive behavioral skills training. The two-session format, as well as a target population that has experienced or is at risk for experiencing alcohol-related consequences appear to be critical as well. Finally, based on Fixsen's guiding principles of implementation science, the value of identifying a purveyor, or at the very least, a champion of BASICS' underlying principles, should be considered.

6.0 CONCLUSION

Binge drinking among college students has become a significant public health concern over the past few decades. With nearly two in five students reporting dangerous levels of alcohol consumption, the need for effective prevention and intervention strategies is imperative. The evidence-based program Brief Alcohol Screening and Intervention for College Students (BASICS) is a brief motivational intervention aimed at decreasing risky alcohol consumption and the negative health, social, and legal consequences associated with such behavior. Based on a combination of motivational interviewing, personalized normative feedback, and cognitive behavioral skills training, BASICS has shown modest to high efficacy when implemented in research settings.

This thesis has examined twelve research studies that have implemented BASICS with particular attention paid to the level of fidelity with which the program was implemented and the programs' use of seven core implementation components. These components have been identified in the literature on implementation science as necessary steps in the successful uptake of an evidence-based program by an organization. The results of the analysis indicate that higher levels of fidelity are associated with better outcomes. Additionally, when a program is implemented with fidelity and yields successful outcomes, many or all of the seven core implementation components are present. In some instances, the use of a component is implicit, rather than explicitly stated. Still, with regard to the implementation of BASICS, there is a clear

association between use of core implementation components and significant decreases in alcohol consumption and related harm. Upon implementing BASICS on college campuses, these seven components should be addressed in order to maximize the positive outcomes associated with the program.

APPENDIX

LITERATURE TABLES

Table 2. BASICS Programs Reviewed

Authors (year)	Setting	Participants	Eligibility	BASICS Therapist	Main Outcomes	Fidelity to BASICS
Borsari & Carey (2000)	Large Northeastern University	n = 29 students (BASICS) n = 31 students (controls) Recruited from undergraduate introductory psychology course	2+ binges (5/4 measure) in past month	Principal investigator (clinical graduate student)	At 6 weeks follow-up: BASICS group had significant reductions in # drinks per week, # drinking occasions in past month, frequency of binge drinking in past month; No difference in RAPI scores	High
Larimer et al. (2001)	Large West Coast University	n = 77 students (BASICS) n = 82 students (controls) Recruited from 12 fraternities	Incoming fraternity pledge class members; Not necessarily high-risk drinkers; at risk for alcohol misuse because of Greek status	Trained undergraduate peer interventionist OR clinical graduate student	At 12-month follow-up: BASICS group had significant reduction in avg. drinks per week and peak BAC; No differences in quantity of alcohol per occasion, drinking frequency, RAPI scores, or sx of dependence	Medium

Table 2 continued

Authors (year)	Setting	Participants	Eligibility	BASICS Therapist	Main Outcomes	Fidelity to BASICS
Murphy et al. (2001)	Auburn University	n = 30 students (BASICS) n = 29 students (alcohol education program) n = 25 students (controls) No information on recruitment	Upper 33% of screening sample in terms of # of drinks per week AND endorsed 2 or more problems on RAPI	Clinical Psychology Graduate Students	At 3, 6, 9, and 12-month follow-up: BASICS group had no significant reductions in drinks per week, drinking days per week, binge days per week, RAPI, or symptoms of alcohol dependence; However, "heaviest drinkers" showed greater reductions on all measures compared to the rest of the BASICS sample	High
Borsari & Carey (2005)	Two urban campuses in Northeastern United States	n = 34 students (BASICS) n = 30 students (alcohol education program) Recruited from pool of students who violated campus alcohol rules	Campus alcohol violation AND 2+ binges in past 30 days and/or AUDIT score of 10+	Principal investigator (clinical graduate student)	At 6-month follow-up: BASICS group had no significant reductions on # drinks per week, freq. of binge drinking in past 30 days, typical/peak BAC, or alcohol-related problems	High
Neighbors et al. (2006)	Medium-sized Midwestern University	n = 108 students (feedback program group) n = 106 students (controls) Recruited from undergraduate introductory psychology course	At least one binge (5/4 measure) in past month	n/a Program group received online personalized normative feedback	At 2-month follow-up: Feedback group had a significant reduction in avg. # of drinks per week and perceived norms compared to controls; No significant reductions in alcohol-related problems	Low
White et al. (2006)	Rutgers University	n = 118 students (BASICS) n = 104 students (written feedback only) Recruited from pool of students who violated campus alcohol **or** drug rules	Campus alcohol violation; no prior substance abuse treatment or depression	Counselors from Rutgers University Alcohol and Other Drug Assistance Program for Students	At 4-month follow-up: Students in both groups had significant reductions in # occasions of heavy drinking in past month, highest BAC in typical week, total # drinks per week, and drug and alcohol RAPI scores compared to baseline assessment	Medium

Table 2 continued

Authors (year)	Setting	Participants	Eligibility	BASICS Therapist	Main Outcomes	Fidelity to BASICS
Larimer et al. (2007)	Medium-sized West Coast public university	n = 737 students (feedback program group) n = 751 students (controls) Recruited from larger, 5-year longitudinal study on campus alcohol programs	Not high-risk drinkers (universal prevention)	n/a Program group received mailed personalized normative feedback and 10 weekly postcards with alcohol norms, stats, and safety tips	At 12-month follow-up: Feedback group had significant reductions in total drinks per week, freq. of alcohol use in past month, freq. of alcohol use in past year. No significant reductions in peak BAC or negative consequences	Low
Martens et al. (2007)	Large, Northeastern State University	n = 175 students (BASICS) Recruited from student health and student mental health centers	AUDIT scores of 8+	Counseling center staff members	At 6-week follow-up: BASICS group had significant reductions in drinks per week, peak drinking, and heavy episodic drinking compared to controls	High
Saitz et al. (2007)	Boston University	n = 324 students ("extensive" brief alcohol program) n = 326 students ("minimal" brief alcohol program) Entire freshman class recruited via e-mail	AUDIT scores of 8+	n/a Both groups received online personalized normative feedback, accurate alcohol information, and safety tips	At 1-month follow-up: No differences in # drinks per week, max # drinks per occasion, # heavy drinking episodes between baseline and follow-up for either group. 33% of females and 15% of males who had "unhealthy alcohol use" at baseline no longer had unhealthy alcohol use at follow-up (based on AUDIT)	Low

Table 2 continued

Authors (year)	Setting	Participants	Eligibility	BASICS Therapist	Main Outcomes	Fidelity to BASICS
Schaus et al. (2009)	Large, public Southeastern university	n = 181 students (BASICS) n = 182 students (controls) Recruited from student health center	At least one binge (5/4 measure) in past 2 weeks	One of four health center clinicians (Two physicians, one physician assistant, one nurse practitioner)	At 3 and 6-month follow-up: BASICS group had significant reductions in avg. # drinks per week, # times drunk in a typical week, typical/peak BAC, # drinks per sitting, and RAPI scores compared to controls; No significant reductions in avg. # drinks per sitting or # binges in past month. At 9-month follow-up: Only the reductions in RAPI scores were still significant in BASICS group	High
Turrisi et al. (2009)	Large, public Northeastern university and large, public Northwestern university	n = 277 students (BASICS only) n = 316 students (parent program) n = 342 students (BASICS + parent) n = 340 students (controls) Recruited from university's incoming freshman class	All participants were athletes in high school; not necessarily high-risk drinkers; at risk for alcohol misuse because of participation in high school athletics	Trained undergraduate or entry-level graduate peer interventionist who were also college athletes	At 10-month follow-up: Combo group had fewer negative consequences than BASICS-only group; Combo group had significant reductions in peak BAC, # drinks per week, # drinks per weekend, and negative consequences compared to parent-only group and controls; BASICS-only group had lower peak BAC and fewer drinks per weekend than controls	Medium
Whiteside et al. (2010)	Not specified	n = 1 (case study) Recruited from larger study of brief alcohol programs	Not specified	Trained undergraduate peer interventionist	No statistical procedures performed; From baseline to 3-month follow-up: Reduction from 28 drinks per week to 11 drinks per week; reduction in heavy episodic drinking from 8 times per month to 3 times per month; reduction in alcohol-related problems from 9 to 5	High

Table 3. Use of core implementation components (as explicitly described among research studies)

	Staff Selection	Preservice and Inservice Training	Ongoing Consultation and Coaching	Staff Evaluation	Program Evaluation	Facilitative Administrative Supports	Systems Interventions
Borsari & Carey (2000)	--	--	BASICS sessions were regularly supervised by an MI-trained clinical psychologist	--	Participants rated overall satisfaction with BASICS program and whether they'd recommend it to another student	--	--
Larimer et al. (2001)	--	Peer interventionists each received 8 to 12 hours of didactic training	Each therapist had one or two supervised interviews	--	--	--	--
Murphy et al. (2001)	--	Unspecified training	Supervised by clinical psychologist	Participants rated therapist's competence	Participants rated BASICS with regard to interest, personal relevance, and overall quality	--	--
Borsari & Carey (2005)	--	--	--	Audiotapes were rated for therapist warmth, egalitarianism, affect, engagement, and other MI skills based on *Motivational Interviewing Skill Code: Coder's Manual*	--	--	--
Neighbors et al. (2006)	--	--	--	--	--	--	--

Table 3 continued

	Staff Selection	Preservice and Inservice Training	Ongoing Consultation and Coaching	Staff Evaluation	Program Evaluation	Facilitative Administrative Supports	Systems Interventions
Borsari & Carey (2000)	--	--	BASICS sessions were regularly supervised by an MI-trained clinical psychologist	--	Participants rated overall satisfaction with BASICS program and whether they'd recommend it to another student	--	--
White et al. (2006)	--	Counselors trained in BASICS and MI techniques by a clinical psychologist	Counselors who delivered BASICS received weekly supervision from MI-trained clinical psychologist	Some BASICS sessions audiotaped to assess therapist fidelity to MI and BASICS components; Therapists performed self-evaluation of tasks, empathy, nonjudgment, etc after each session	--	--	--
Larimer et al. (2007)	--	--	--	--	--	--	--
Martens et al. (2007)	--	2-day workshop on BASICS from both external and internal consultants familiar with BASICS; mock BASICS sessions	--	--	--	--	--
Saitz et al. (2007)	--	--	--	--	--	--	--

Table 3 continued

	Staff Selection	Preservice and Inservice Training	Ongoing Consultation and Coaching	Staff Evaluation	Program Evaluation	Facilitative Administrative Supports	Systems Interventions
Borsari & Carey (2000)	--	--	BASICS sessions were regularly supervised by an MI-trained clinical psychologist	--	Participants rated overall satisfaction with BASICS program and whether they'd recommend it to another student	--	--
Schaus et al. (2009)	--	Student health center clinicians each received 8 hours of education and training in MI, BASICS, and the NIAAA curriculum "Clinical Protocols to Reduce High Risk Drinking on College Students." They also engaged in role play and behavioral rehearsal	--	Therapist and MI-trained mental health counselor jointly reviewed session audiotapes monthly; therapists completed a checklist of MI skills and BASICS components that that had utilized during the session and discussed results with trainers	--	--	--

Table 3 continued

	Staff Selection	Preservice and Inservice Training	Ongoing Consultation and Coaching	Staff Evaluation	Program Evaluation	Facilitative Administrative Supports	Systems Interventions
Borsari & Carey (2000)	--	--	BASICS sessions were regularly supervised by an MI-trained clinical psychologist	--	Participants rated overall satisfaction with BASICS program and whether they'd recommend it to another student	--	--
Turrisi et al. (2009)	--	Peer interventionists participated in ten weekly training workshops which included didactic presentations, written materials, videotapes, interactive exercises, and role play; workshops were conducted by clinical psychologists and counselors	--	All sessions audiotaped and coded for fidelity to MI techniques, empathy, motivational interviewing spirit, and other BASIS behaviors	--	--	--
Whiteside et al. (2010)	--	--	--	--	--	--	--

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