MOTIVATIONAL INTERVIEWING
WITH HAZARDOUS DRINKERS

by

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SUPERVISORY COMMITTEE APPROVAL

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ABSTRACT

This study targeted rural people at risk for alcohol dependence utilizing Community Health Care Centers in rural Southeastern Idaho. Hazardous alcohol users are an important population, since their alcohol pattern implies a high risk of future damage to health. Hazardous alcohol use is defined as an established pattern of use, placing the user at increased risk for future damage to physical and mental health but not yet evidencing significant medical or psychiatric problems.

Motivational interviewing (MI) is a well-documented intervention used to assist people in recognizing their current or potential problems and to consciously decide to change their behavior. It is a therapeutic style intended to help clinicians work with clients to address their ambivalence.

A treatment protocol incorporating the strengths of motivational interviewing into a systematic approach to hazardous drinkers in community clinic settings was designed and compared against a no treatment comparison group.

A screening device named Alcohol Use Disorders Identification Test (AUDIT) was used to screen interested clients’ alcohol use. Clients achieving an AUDIT score indicting hazardous alcohol use were recruited into the study and randomized into a control or treatment group. Twenty-six hazardous drinkers attending five low-income Community Health Centers participated in the study.
The experimental group participated in one motivational interviewing session with the investigator. The comparison group received no treatment. Alcohol use was tracked for 6 weeks after successful recruitment into the program.
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CHAPTER 1

INTRODUCTION

Over the past several years, substantial research and clinical attention has explored methods of motivating alcohol users to stop or reduce excessive use either independently or through formal programs (Miller, 2001). Hazardous alcohol users are an important population, since their alcohol pattern implies a high risk of future damage to health. Hazardous alcohol use is defined as an established pattern of use, placing users at increased risk for future damage to physical and mental health but not yet evidencing significant medical or psychiatric problems (Volk, 1997). Considerable suffering, economic costs and morbidity may result from heavy drinking. When drinking exceeds 14 drinks a week or 5 or more drinks per occasion for men, the risk of psychosocial, economic and legal problems increases (Bush, 1998). Often, primary care clients who might benefit from brief alcohol-related interventions are not recognized until they develop serious complications of drinking.

According to Fleming and Manwell (1997), many people at risk for, or already having alcohol problems, do not consult alcohol treatment specialists; they receive their comprehensive health care from a primary care provider. A goal of Healthy People 2010 is to reduce the treatment gap for alcohol problems (U.S. Department of Health and Human Services, 2000). Alcohol use severity can vary among individuals, from early
stage hazardous alcohol use to severe alcohol dependence or abuse. Consequently, a
variety of methods may be needed to treat different individuals at different levels of
alcohol use. Research supports the use of short-term interventions whenever appropriate,
and short term interventions have been demonstrated to be as effective as long-term
counseling in many individuals (Whittinghill, Whittinghill, Rudenga, & Loesch, 2000).
Short-term interventions also carry a lower cost than long-term interventions or
admission to inpatient treatment. Therefore, this study was specifically designed to
identify and treat hazardous drinking in the primary care environment.

Current research on motivation reflects changing views about both client
motivation and clinician roles in promoting and maintaining behavior change.
Motivation was previously viewed as a fixed trait that clients either did or did not have.
Additionally, motivation was considered clients responsibility, not the clinicians (Miller
& Rollnick, 1991). Newer definitions of motivation include the following assumptions:
motivation is key to change, motivation is dynamic and fluctuating, motivation is
influenced by social interactions, and motivation can be modified (Miller, 2001).
Research on motivational interviewing interventions has consistently been superior to no
treatment control groups. It has been shown to be similar to comparison groups such as
skills-based counseling and confrontive feedback sessions (Miller & Rollnick, 2002).

Therefore, the purpose of this study is to evaluate the effects of motivational
interviewing (Miller & Rollnick, 1991) as an effective intervention for hazardous
drinkers attending primary care clinics. An abbreviated review of the factors leading to
and sustaining drinking behavior is presented. The theory behind motivational
interviewing including its history, rationale, principles, and techniques as well as a brief
discussion of its efficacy is presented. In addition, a review of the history and rationale for the transtheoretical stage-of-change model (DiClemente & Prochaska, 1982; Miller & Tonigan, 1996) and how it relates to motivational interviewing is provided. The current study investigated questions regarding the treatment efficacy of motivational interviewing on the drinking behavior of hazardous drinkers.

A treatment protocol incorporating the strengths of motivational interviewing into a systematic approach to hazardous drinkers in a community clinic setting was designed and compared against no treatment comparison group. Since many of the motivational interviewing studies have been conducted in research settings other than community based clinics, the study added to the existing intervention literature. Miller and Rollnick (2002) recently reviewed 26 studies using motivational interviewing, 12 of which addressed problem drinking. Of these studies, 5 were conducted in substance abuse clinics, 2 on college campuses, 4 in a hospital or emergency department setting, and 1 in a prenatal clinic. Of the remaining 14 studies, which examined factors such as smoking, HIV risk factors, diet, exercise and eating disorders, only 3 were conducted in a general medical practice setting. A concluding section discussed the benefits and possible limitations of the motivational interviewing treatment program and suggests possible directions for future research. Prior to presenting the current study methodology, the background literature on hazardous alcohol use was reviewed.
CHAPTER 2

RESEARCH

In researching the issue, an extensive literature review was conducted. Several databases from 1990-2003 were utilized. Databases include The Cumulative Index to Nursing and Allied Health (CINAHL), MEDLINE, The Cochrane Library Database of Systematic Reviews, The Online Journal of Knowledge Synthesis, PsycINFO, LiLI-D, Combined Health Information Database, EBSCO Subscription Service, The National Guideline Clearinghouse, Academic Universe Statistical, MD Consult, and Health Database. Websites for Motivational Interviewing, Substance Abuse and Mental Health Services Administration, National Institute on Alcohol Abuse and Alcoholism, and National Institute of Health were systematically searched. The search terms alcohol, alcohol abuse, problem drinkers, hazardous drinkers, alcohol screening and alcohol treatment were used to obtain a broad overview of literature. Search terms, motivational interviewing, brief motivational interventions, and self-efficacy, were added to elicit further literature. Reference lists from studies were perused for further related studies. Over 70 journal articles were used for the review of literature. The literature on alcohol was extensive and was narrowed to alcohol screening, alcohol abuse treatment, brief motivational interventions and motivational interviewing.
Motivational Interviewing: Theoretical Base

Motivation interviewing began as a response to the inadequate alcohol treatment strategies used in the late 1970s and early 1980s. Miller (1985) noted that therapists could help clients that were unmotivated to build motivation. Rather than labeling drinkers low motivation as a character flaw, defense mechanism or a static personality trait, Miller suggested that motivation was a dynamic impressionable state. As part of the interaction between clients and therapists, motivation to change is responsive to both internal and external factors. Miller and Rollnick's (2002) current approach to motivational interviewing focuses a way of being with people, the "spirit of motivational interviewing" (p. 34). This fundamental approach to motivational interviewing includes three aspects: collaboration, evocation, and autonomy. Collaboration is defined as a partnership honoring the clients perspective and experience. Counselors provide an atmosphere that is facilitating, not coercive. Evocation implies that the motivation and resources for change are within clients. Utilizing client’s own perceptions, values and goals enhances inherent motivation for change. Autonomy infers that counselors affirms clients right of self-direction and facilitates informed choice (Miller & Rollick, 2002).

In Miller’s (1985) review of the existing motivation research, hundreds of studies directed at influences on motivation in alcoholics were examined. He noted a recurrent set of factors within the interventions that were found to be effective in motivating drinkers to change within a limited number of sessions. These key elements included the following: personal feedback on the harmful effects of excess alcohol in individuals; an emphasis on clients’ responsibility and freedom of choice in the maintenance of drinking behaviors; the need for clear, non directive advice, given as recommendations and not
contingencies; a menu of alternatives for clients; the need for therapists to be empathic, warm, supportive, attentive, and sympathetic, using client-centered skills of reflective listening; and an emphasis on clients’ self-efficacy and perceived optimism. The acronym for the six elements is FRAMES and is referred to in much of the motivational interviewing literature (Bien, Miller, & Tonnigan, 1993). The self-efficacy factor had been found to be a powerful influence on client motivation and potential treatment outcomes.

In summary, Miller (1983, 1985) described the necessary components to develop a model of intervention that could enhance the therapeutic efficacy of alcohol treatment. He developed a treatment approach that could be taught to therapists using treatment components and client-centered techniques such as FRAMES that had been found to be very effective. These efforts by Miller (1983, 1985) led to the publication of the text Motivational Interviewing by Miller and Rollnick (1991), outlining the basic principles and procedures of this approach.

**Key Concepts and Theoretical Principles**

Motivational interviewing (MI) is a well-documented intervention used to assist people in recognizing their current or potential problems and to consciously decide to change their behavior (Miller & Rollnick, 1991). It is a therapeutic style intended to help clinicians work with clients to address their ambivalence, a key concept. While traditional models of alcohol treatment indicate that ambivalence is indicative of resistance, the motivational interviewing therapist is trained to roll with resistance or denial.

Another key concept of motivational interviewing utilizes nonconfrontational approaches that ideally result in clients acknowledging concern about alcohol use and the
need to decrease intake (Compton, Monahan, & Simmons-Cody, 1999). The technique consists of practitioner’s acceptance of clients and participation as therapeutic agents in the change process. Motivational interviewing activates the capability for change that everyone possesses (Rollnick & Miller, 1995). Through resolving ambivalence, people can begin moving toward change. The practitioner’s role in motivational interviewing is directive, with a goal of clients’ behavioral change.

A final key concept in motivational interviewing is the deemphasis of labeling. Miller and Rollnick (1991) note many favorable outcomes of people who succeeded in treatment without referring to themselves as alcoholic, and the lack of evidence of benefits in forcing clients to accept the “alcoholic label.”

Five basic principles described by Miller and Rollnick (1991) form the foundation of motivational interviewing. The first principle entails expression of empathy. Empathy is essential to clarify and work through ambivalence without creating further resistance. Miller and Rollnick (2002) redefined this principle (accurate empathy) as listening skillfully and reflectively, not imposing the practitioner’s own view but rather clarifying participants experience and meaning. A second principle is to develop discrepancy between drinkers personal goals and aspirations and current drinking behavior. The aim of developing discrepancies helps drinkers become aware of their inconsistencies through self-contemplation and guides them into changing their behavior according to their goals. Avoidance of argumentation is the third principle, which is counterproductive and may increase resistance. The fourth principle, rolling with resistance, suggests that counselors use drinkers’ own momentum to shift perceptions rather than direct confrontation. As drinkers achieve their goals, self-efficacy is enhanced, the fifth principle, which may
improve their sense of control and bolster future changes. Two other important conditions practitioners must have to prepare the way for change are nonpossessive warmth and genuineness, according to Miller and Rollnick (2002).

**Assessment Strategies Employed in Motivational Interviewing**

Since the fundamental tenant of motivational interviewing is to raise individuals’ awareness of the negative consequences of hazardous drinking, objective measures are used as an additional source of motivational feedback. Motivational interviewing practitioners use assessment tools to measure clients’ alcohol use and related problems. Assessment tools such as the Drinker’s Check Up, Alcohol Timeline Followback, and Alcohol Use Disorders Inventory can be used as a prelude to treatment (Bush, Kivlahan, McDonell, Fihn & Bradley, 1998, Sobel, Toneatto, & Sobell, 1994). Serum chemistry tests measuring alcohol’s impact on the liver and neuropsychological measure testing chronic effects on the brain have been employed by Miller (1983). Additional measures that could be employed include self-report questionnaires assessing family history of alcohol problems, quitting and abstinent self-efficacy scales, stages of change or readiness scales (Prochaska & DiClemente, 1992, Miller & Tonnigan, 1996). After-care telephone contacts have high correlations with other measurements of drinking by collateral (such as spouse or housemate) reporting (Breslin & Sobell, 1996). Self-monitoring and reporting through use of calendars, black and white days (days of drinking and no drinking), and computer assessment are additional assessment techniques (Sobel, Toneatto, & Sobell, 1994). The overall focus of the assessment phase of motivational interviewing is to objectively demonstrate to hazardous drinkers the discrepancy between their life goals (healthy lifestyle) and current situation (legal
problems, liver dysfunction). For the current study, feedback from the Alcohol Use Disorders Inventory as well as the Six-Week Alcohol Quantity/Frequency tool was used during the motivational interviewing session.

Techniques and Strategies Employed in Motivational Interviewing

Throughout motivational interviewing, practitioners use techniques based on client-centered therapy (Miller, 2001). These techniques include expressing empathy through reflective listening, communicating respect for and acceptance of clients and their feelings and the use of open-ended questions to allow clients the opportunity for self-reflection and exploration of their drinking behavior. Other therapeutic techniques used in motivational interviewing include reflective listening and summarizing while establishing a nonjudgmental, collaborative relationship. Motivational interviewing practitioners emphasize sincere affirmations, complementing rather than denigrating, and listening rather than telling. Self-efficacy is enhanced by practitioner optimism, focusing on the client's strengths to support his/her hope and optimism needed to make change.

Miller (1989) described particular strategies to enhance motivation. He noted that occasionally motivation is restrained by practical barriers such as cost of treatment and distance required to attend treatment. If these barriers can be eliminated, the more likely it is that clients will participate in treatment. Use of court mandates and motivational interviewing interventions enhances compliance with alcohol and drug offenders (Miller & Rollnick, 2002). The potential motivating force of hazardous drinkers families and friends should also be considered. Miller (1989) suggests the possibility of training families and friends of hazardous drinkers in reinforcement techniques.
Bell and Rollnick (1994) suggest additional strategies to enhance motivational interviewing, such as having clients discuss a typical day or week related to drinking behavior. Rapport is built through reflective listening, enhancing the therapeutic environment. The feedback aspect of motivational interviewing provides clients with information and advice. Bell and Rollnick suggest that prior to giving information, feedback and advice that clients have adequate time to discuss personal implications of the information provided. "Asking permission" prior to giving feedback (Miller, 2001) is advised. A final technique Bell and Rollnick suggest is the exploration of problems or concerns that clients may be having as a result of alcohol use. By discussing these concerns in detail, and allowing time for self-reflection, practitioners may help clients progress through the stages of change.

The final phases of motivational interviewing are strengthening commitment to change, and summarizing. Strengthening commitment to change requires practitioners to recognize the client's contemplation has turned toward change and is motivated to make changes in drinking behavior. The cost-benefit analysis of change versus no change is discussed. Practitioners present the information from alcohol assessments and offers advice, if given permission from clients. Finally, a plan for change may be included. Based on the advice given, this could range from abstinence to tapering down drinking to a less harmful level. Other harm reduction strategies such as not driving while drinking may be employed. The plan for change is a negotiated process in which hazardous drinkers are given free choice in the decision. The end of the process consists of practitioners summarizing or recapitulating clients' major reasons for change that have been detected through assessments, statements, questioning, and feedback. Clients are
reminded of their self-motivational statements, the perceived benefits of changing as opposed to not changing, and the plan of change. At the conclusion of this summary, practitioners express confidence in the ability of clients to change, and that it is the singular responsibility of the client.

**Efficacy of Motivational Interviewing Therapy**

Motivational interviewing was developed originally to work with problem drinkers (Miller, 1983; Miller et al., 1998). Problem alcohol drinkers in the community given motivational interviewing interventions showed large decreases in drinking, although seldom initiated treatment for drinking (Marlett, Baer, Kivlahan, Dimeff, Larimer, Quiqley, Somers, & Williams, 1998; Miller et al., 1993). Motivational interviewing has been used with a variety of health problems such as smoking cessation, hypertension lifestyle modification, dietary modification, diabetes, HIV risk behavior, sexual offenses and heroin use (Miller, 1996). The Project Match study compared three treatments for alcohol use (Motivational Interviewing, Cognitive Behavioral Coping Skills Therapy, and Twelve-step Facility Therapy) with 1736 participants (Project Match Research Group, 1997). The motivational interviewing sessions were given over 4 weeks and were effective over the 15-month study period. A pilot study by Handmaker, Miller, and Manicke (1999) of 42 pregnant drinkers found the intervention effective in reducing problem drinking. Significant reduction from pre to postintoxication level ($t = 3.46, p < .01$), and significant increase in total abstinent days ($t = -2.18, p = .015$) was found. Injection drug users ($N = 196$) were treated with motivational interviewing or risk reduction. Booth, Kwatkowski, Igughi, Pinto, and John (1998) found motivational interviewing had approximately the same effectiveness as risk reduction.
Miller, Benefield, and Tonigan (1993) compared two therapy styles in enhancing motivation for change in problem drinking. Forty-two problem drinkers were assigned randomly to three groups: directive-confrontational counseling, client-centered counseling, or delayed checkup (control). The more the counselor confronted, the more the client drank one year later ($r = .65, p < .001$). Comparison of the two therapy groups combined against the delayed treatment group demonstrated a significant decrease in weekly consumption ($F (1,39), 3.08, p < 0.09$) and days drinking per week ($6.32, p < .01$).

Motivational interviewing is also referred to as brief motivational interventions; therefore this literature was also reviewed. Brief motivational interventions are defined as 15-20 minute counseling sessions between a health care provider and a client. Miller and Rollnick (1991) report that relatively brief interventions of one to three sessions are comparable to more intensive treatment for alcohol problems. Meta-analyses found that most brief intervention trials showed a positive outcome, with reduced consumption levels. Barnes and Samet's (1997) six randomized, controlled trials in primary care or community-based settings in the U.S., England and Sweden, tested brief motivational interventions with 6 months follow-up. The groups receiving brief motivational interventions had statistically significant reduction in alcohol consumption, sick days and hospital days compared to the control group.

The World Health Organization (1996) conducted a cross-national trial of brief motivational interventions with 1559 heavy drinkers from eight countries. Comparison of a control group, a simple advice group, and a brief motivational counseling group showed a significant reduction in drinking in the simple advice and brief motivational counseling
groups, suggesting that 5 minutes of simple advice were as effective as brief motivational
counseling and extended counseling of up to three sessions (Saunders, Babor, De la
Fuente, & Grant, 1993). Studies comparing motivational interviewing with other alcohol
treatments such as confrontational interviewing, discussion class, and self-help manuals
supported use of motivational interviewing (Baer, Marlett, Kivlahan, Fromme, Larimer,
& Williams, 1992; Schneider, 2000). The groups receiving motivational interviewing
showed statistically significant decreases in drinking. Long-term follow-up showed
continued decline in drinks per month in these studies. Studies examining the efficacy of
a brief motivational intervention designed to reduce the harmful consequences of heavy
drinking by problem drinkers revealed significant reductions in drinking rates (Fleming,

A cost-benefit study of a brief motivational intervention treatment for drinkers in
a primary care setting followed 774 problem drinkers for 3 years after the intervention
(Fleming, Mundt, & French, 2000). Significant long-term decreases in alcohol use — a
57% reduction in the treatment group was reported over the 48-month follow-up. Due to
20% fewer emergency department visits in the treatment group, cost-benefit analysis
showed a medical care savings per person of $712. Fleming, Mundt, French, Baier,
Stauffacher, and Lawton (2002) estimate that each $1 spent on the brief intervention
saves $4.30 for the health care system.

According to Bien, Miller and Tonnigan (1993), even very brief motivational
interventions in primary health care settings for people with hazardous alcohol use can
produce lasting reductions in hazardous alcohol and improvements in health. This
approach to secondary prevention of alcohol abuse provides an opportunity to identify
hazardous drinkers requiring more help, who may otherwise go untreated (Bandura, 1997).

A meta-analysis of controlled studies utilizing motivational interviewing by Miller and Rollnick (2002) showed strong support for the efficacy of motivational interviewing in treating alcohol problems, with 11 of 12 studies showing positive results. In other domains such as smoking, HIV risk behaviors, drug addiction, and psychiatric drug adherence, of 10 studies, 5 had positive outcomes. Studies comparing motivational interviewing to other interventions rated higher than social skills training or cognitive therapy (Miller & Rollnick, 2002).

Studies of motivational interviewing include such populations as college students, young adults, alcoholics, pregnant women, adolescents, eating-disordered patients, obese older women, and diabetic patients. Settings include primary care clinics, hospitals, residential alcohol treatment programs, employee assistance programs, and student health clinics. A limitation of the reviewed studies is that no studies have focused on a population of low-income individuals specifically. From the preceding review, it appears that brief motivational interviewing interventions for alcohol problems: a) are significantly more effective than no intervention, b) there is similar impact as more extensive interventions, and c) MI may enhance the effectiveness of subsequent treatment (Bien et al., 1993). There is a knowledge gap on motivational interviewing as an intervention for heavy alcohol use in rural primary care settings with low-income individuals, as proposed in this study.
The Relationship of MI and the Stages-of-Change Model

The change process has been conceptualized as stages through which people progress as they consider, initiate, and maintain new behaviors (Miller, 2001). The apparent association between motivational interviewing and the stage-of-change model is the culmination of several researchers investigating the relationship between motivation for change and the corresponding degree, and continued maintenance of change (Bien et al., 1993; DiClemente & Prochaska, 1982, 1985; Marlet, Baer, Donavan & Kivlahan, 1988; Miller, 1985; Rollnick & Miller, 1995).

Prochaska (1979) built on previous research and proposed five processes of change: consciousness raising, catharsis, commitment, conditional stimuli, and contingency management. These processes included verbal and behavioral processes, including exchanges between clients and therapists and manipulation of clients behavior.

Other researchers added to these stages of change. DiClemente and Prochaska (1986) extended Prochaska's original work and developed a three-stage model of change to assess whether the processes of change related to the hypothesized stages of change in a distinct pattern. Their investigation analyzed the processes of change in smokers who had recently stopped on their own or with the assistance of various smoking cessation programs. The results demonstrated that a smoker's motivation to change could be differentiated into discrete stages that separated smokers who had made a decision to quit smoking but had not yet stopped from those who were in the actual process of stopping smoking, and from smokers who had been able to maintain abstinence at 5-months followup. Prochaska and DiClemente (1986) continued to develop their stage of change model to describe clients' state of motivation. A six-stage model of change was proposed by Prochaska, DiClemente and Norcross (1992).
The key concepts of the stage-of-change model are that individuals are at various stages of change (Prochaska & DiClemente, 1986), and internal motivation is the catalyst to move from one stage to another. The stages of change are defined as: (1) The *Precontemplation* stage in which hazardous drinkers are unaware of difficulties (negative consequences or cost) arising from alcohol use and in which they tend to seek treatment only when coerced. They may not have experienced any negative consequences from their pattern of alcohol use. (2) In the *Contemplation* stage hazardous drinkers are starting to recognize some of the personal costs of drinking, and they begin to enter into a state of conflict between the costs and benefits of continued use of alcohol. These individuals are typically ambivalent about their behavior, seeing reasons for change and not to change. Persons may remain in this stage for extended periods. (3) Hazardous drinkers who are in the *Determination* (or Preparation) stage are preparing to move from contemplation into the action phase and are examining reasons for the change as well as increasing skills to progress into the next stage. In this stage, the costs are beginning to outweigh the benefits of drinking. Preparation entails an examination of one's self-efficacy for change. Clients may have already attempted to cut back or stop use on their own. (4) During the *Action* stage hazardous drinkers plans for change are formally implemented and their drinking pattern is interrupted by a plan of action chosen by the individuals. In this stage, hazardous drinkers are likely to encounter feelings of ongoing ambivalence in which they revisit the cost and benefits of the change. This stage can last from 3 to 6 months following termination or reduction of alcohol use. (5) Hazardous drinkers who are continuing through the change process and starting to achieve personal goals represent the *Maintenance* stage. In many cases individuals
attempting long-term change will revert to an earlier change stage at least once (Prochaska et al., 1992). (6) The *Relapse* stage is viewed as a normal and expected part of the change process and is identified by hazardous drinkers who have relapsed or are starting to lapse. After a return to alcohol use, individuals usually revert to an earlier change stage, more often to some level of contemplation. The goal of this stage is to assist the hazardous drinker to renew his/her commitment for change and reenter the motivation cycle (Bell & Rollnick, 1994).

Miller and Rollnick (2002) suggest that motivational interviewing is an excellent technique to utilize with clients who are in the early stages of change, by facilitating clients to examine their own behaviors and consequences. In the late stages of change, motivational interviewing is effective as the role of practitioners changes from motivating to coaching and advising. Practitioners can help clients develop a plan, anticipate barriers and identify support systems. During the action and maintenance phase, motivational interviewing approaches can help increase self-efficacy and reinforce clients' accomplishments. In conclusion, motivational interviewing and the stages of change are complementary. Understanding the current motivation of clients, practitioners may enhance treatment of hazardous drinkers as they negotiate the stages of change.

**Hazardous Alcohol Use**

Because the purpose of this study is to investigate the effectiveness of motivational interviewing as an intervention for hazardous drinkers in primary care practice, the exploration of the current literature on hazardous use of alcohol was abbreviated. The brief review was limited to studies published since 1990 with some post-1985 studies if pertinent and meaningful. While some researchers have suggested
different factors contributing to the development of alcohol use/dependence, the review focused on theories relating to psychosocial, biological, cultural and family variables. A review of several models of addiction guiding treatment of hazardous drinkers both in the past and present is presented.

**Impact of Alcohol on Health**

According to the 1999 National Household Survey on Drug Abuse, an estimated 105 million Americans age 12 and older reported current use of alcohol “within the past 30 days.” Around 45 million of this group report binge drinking, indicating 5 or more drinks on one occasion within the past 30 days. Heavy drinkers, consuming 5 or more drinks on 5 or more days within the past 30 days, are reported at 12.4 million persons. The age of peak prevalence for current alcohol use, binge drinking and alcohol abuse is 21. An estimated 802 million Americans are dependent on alcohol (3.7%). Males are more likely to be dependent on alcohol (4.9%) than females (2.6%) (U.S. Department of Health and Human Services, 2000). The 1992 National Longitudinal Alcohol Epidemiological Survey reports that total alcohol and dependence prevalence for Americans age 18 and over was 7%. In the age group 18 to 29 the prevalence was 16% (U.S. Department of Health and Human Services, 1999). The National Institutes of Health, Substance Abuse and Mental Health Services Administration report in Healthy People 2010 notes that nearly 10% of current drinkers (8 million) meet the diagnostic criteria for alcohol dependence and 7% meet criteria for alcohol abuse.

Each year there are about 100,000 deaths in the United States related to alcohol consumption (U.S. Department of Health and Human Services, 2000). Binge-drinking of five or more alcoholic beverages on one occasion often results in acute impairment,
which causes a large portion of alcohol related deaths (Centers for Disease Control and Prevention, 1987). The National Institute on Alcohol Abuse and Alcoholism reports that the nonabusing public carries more than one-half of the economic expense of substance abuse problems. In 1994 the economic cost of alcohol and drug abuse was $276 billion. These data represent over $1,000 per person in the United States to cover the cost of health care, motor vehicle crashes, lost productivity, crime and other outcomes of alcohol and drugs (U.S. Department of Health and Human Services, 2000).

The health effects of long-term heavy drinking increase risks for high blood pressure, arrhythmias, cardiomyopathy, and stroke. Increased risk for liver disorders and cirrhosis may occur. Certain forms of cancer risk are increased with heavy drinking, such as esophagus, mouth, throat, and larynx, and possibly breast, colon and rectum. Use of alcohol is linked with deaths from motor vehicle crashes, fires, drowning, and falls. High-risk sexual behavior, suicide, homicide, child abuse and marital violence are also associated with alcohol use; and 41% of motor vehicle crashes in 1996 were associated with alcohol use (U.S. Department of Health and Human Services, 2000). Health problems experienced by alcoholics potentially adversely affect the physical and mental health of as many as 30 million friends and relatives (Naegle, 2001).

Criteria for Alcohol Dependence and Abuse

The American Psychiatric Association (APA) criteria for alcohol dependence include three or more of the following: tolerance, withdrawal symptoms if stopping, larger amounts used over time, persistent desire or unsuccessful efforts to cut down, a large amount of time is spent using alcohol, giving up important social or occupational
activities to drink, and continued drinking despite a persistent physical or psychological problem.

The APA criteria for alcohol abuse include one or more of the following: recurrent alcohol use resulting in a failure to fulfill major responsibilities at home, work, or school, recurrent alcohol use in physically hazardous situations such as driving a car, recurrent legal problems, and continued drinking despite recurrent social problems exacerbated by alcohol use (American Psychological Association, 2000). The population of interest in the current study was those with alcohol abuse, but not dependence, hereafter called hazardous drinkers.

**Hazardous Drinkers**

A recent series of state-based health surveys conducted by the Center for Disease Control and Prevention and state health departments asked persons over age 18 about binge drinking annually from 1993 to 2001 (Naimi, Brewer, Mokdad, Denny, Serdula, and Marks, 2003). Between 1993 and 2001, the number of binge-drinking episodes increased from around 1.2 billion to 1.5 billion. This was a 17% increase in binge drinking episodes per person per year. However, between 1995 and 2001 there was a 35% increase in binge drinking episodes per person per year. The rates were highest for ages 18 to 25, with men accounting for 81% of binge-drinking episodes. Binge drinkers were 14 times more likely to drive after drinking compared with non-binge drinkers (Naimi et al., 2003).
Criteria for Increased Risk for Alcohol-Related Problems

Criteria for increased risk for alcohol-related problems as defined by the National Institute on Alcohol Abuse and Alcoholism (NIAAA, 2000) are as follows: alcohol consumption greater than 14 drinks per week or greater than 4 drinks per occasion for men, or greater than 7 drinks per week or greater than 3 drinks per occasion for women. Moderate drinking is defined as follows: no more than 2 drinks per day for men, no more than 1 drink per day for women, and no more than 1 drink per day for persons over age 65. The NIAAA identified indicators for increased risk for developing alcohol-related problems: 1) drinking above recommended low-risk consumption or in high-risk situations, and 2) personal or family history of alcohol-related problems (NIAAA, 2000).

As previously discussed, the APA criteria for alcohol abuse (hazardous drinking) include one or more of the following: 1. recurrent alcohol use resulting in a failure to fulfill major responsibilities at home, work, or school, such as repeated absences or poor work performance, suspensions, expulsions from school, neglect of household or children, 2. recurrent alcohol use in physically hazardous situations such as driving a car, or operating machines, 3. recurrent alcohol related legal problems, such as arrests for alcohol related disorderly conduct, and 4. continued drinking despite recurrent social problems exacerbated by alcohol use such as arguments with spouse about consequences of intoxication, physical fights (American Psychological Association, 2000). Hazardous use is defined as an established pattern of use, placing the user at increased risk for future damage to physical and mental health but not yet evidencing significant medical or psychiatric problems (Volk, 1997). Hazardous alcohol users are an important population, since their alcohol pattern implies a high risk of future damage to health. Hazardous
alcohol use is operationalized typically using quantity-frequency measures, such as number of drinks per day, number of episodes of binge drinking, and number of weeks of abstinence in the past year. For purposes of this study, the APA definition of hazardous drinking was used.

Factors Associated With Alcohol Use

According to Naegle (2001), many factors contribute to the development of alcohol use/dependence. The most credible theories relate to psychosocial, biological, cultural and family variables. Bandura (1997) notes that alcohol abuse develops gradually over a lengthy duration of social drinking. Many heavy drinkers stabilize their consumption of alcohol at mid-life; some progress to uncontrolled drinking. A large proportion of those who become dependent go back to moderate drinking or give up drinking without treatment (Bandura, 1997). Miller and Rollnick (1991) note that people struggling with alcohol use problems are unlikely to encounter alcohol treatment specialists in nondedicated alcohol settings such as a primary care clinic.

Changing Perspectives on Alcohol Abuse and Treatment

Attitudes of Americans have often shown ambivalence about excessive alcohol and drug use. Physicians were jailed for treating addicts after the 1914 Harrison Narcotics Act (Miller, 2001). In the 1920s although compassionate treatment was available for opiate dependence, the temperance movement created conflicting views about use of alcohol. Over the past 30 years, several models of addiction have guided the application of treatment of hazardous drinkers. The models and methods of treatment are presented.
The Moral model views alcohol use as a freely chosen behavior that is immoral, sinful and sometimes illegal. Those misusing alcohol create suffering for themselves and others and lack self-discipline. These intentional actions are irresponsible and deserve punishment and incarceration (Wilbanks, 1989). Since excessive use of alcohol is a moral choice, change occurs by an exercise of will power, incarceration or external punishment.

The Medical model views excessive alcohol use as a chronic progressive disease with physical causes such as genetics and neurochemical changes in the brain. There is a difference between “drinkers” and “normals”. Enoch and Goldman (2002) report that the heritability of alcoholism is 40 to 60 %, with 40 % of drinkers developing symptoms between ages 15 and 19 years of age. Treatment is usually delivered in a hospital or medical setting utilizing pharmacological therapies for withdrawal, detoxification and symptom reduction. Aversion therapy such as Antabuse may be used for maintenance. The responsibility for resolving the problem is shared between clients and clinicians and change occurs through acknowledging loss of control, utilizing medical treatment and self-help groups (IOM, 1990b).

The Spiritual model of hazardous alcohol use is the most influential model in America. It is associated with 12-Step programs such as Alcoholics Anonymous, Narcotics Anonymous, and Al-Anon. This model concludes that alcohol is used in an attempt to fill a spiritual void. The etiology of alcohol use is less important than a spiritual path to recovery, through recognizing a Higher Power beyond one’s self. Rooted in American Protestantism, 12-step programs teach that surrender to Higher Power aids in character healing, therefore leading to recovery. Other spiritual models use philosophies such as Transcendental meditation (Marlett & Kristeller, 1999) or Native
American sweat lodges, with a common recognition of the limitations of the self and need for transcendent healing.

According to the *Psychological* model, hazardous alcohol use stems from emotional dysfunction, learning deficits, or psychopathology that can be treated behaviorally or through psychoanalysis (Landry, 1996). There are a variety of psychological perspectives, beginning with Sigmund Freud’s work, which had a deep and lasting effect on alcohol abuse treatment. The concept of defense mechanisms such as denial, projection and rationalization focused on early childhood experiences and the unconscious mind (Thombs, 1994). From this perspective, the hazardous use of alcohol is an attempt to compensate for ego structure vulnerabilities, and is motivated by an inability to regulate one’s inner and life and external behavior. Psychoanalysis is a cornerstone of treatment using Freud’s perspective. Other psychological practitioners consider addiction to alcohol to be a symptom of underlying mental disorder. While psychiatric and alcohol use disorders can coexist, psychiatric disorders can produce behaviors that mimic problems often associated with alcohol abuse. Therefore, treatment of the psychiatric disorder should reduce the use of alcohol. Most often reported in women drinkers are anxiety and mood disorders and in male drinkers antisocial personality (Enoch & Goldman, 2002). Behavioral psychologists consider alcohol use a learned behavior, repeated in relation to the quality, number and intensity of reinforcers (McAuliffe & Gordon, 1980). Positive (group acceptance) and negative (lessened anxiety) reinforcers may be used in treatment. Bandura’s concept of self-efficacy or perceived ability to change has also influenced modern conceptions of alcohol abuse (Bandura, 1997).
The importance of socialization processes and culture has led to a Sociocultural model of alcohol abuse. Factors that affect drinkers behavior include cultural and ethnic beliefs, socioeconomic status, availability of alcohol, laws and penalties regulating alcohol use, family and social norms and rules. Alcohol related problems are seen as occurring in interactive relations with families, groups and communities. Therefore, alterations in policies, laws and norms as part of the change process need to be integrated through social groups. Important avenues for change occur through building new social competency skills through the family and group (IOM, 1996).

Myths About Client Traits and Effective Counseling

Recent research has shown that some types of interventions with hazardous drinkers paradoxically reduce motivation for positive change. Understanding of past and current treatment will highlight the real and potential benefits of motivational interviewing interventions in treatment of alcohol problems.

Addiction stems from an additive personality is a persistent belief citing alcohol abusers as those with poor insight, poor self-esteem, and using projection and denial. However, research efforts suggest that there is no persistent characteristic personality among alcohol abusers (Loberg & Miller; 1986; Miller 1996), rather a broad range of personalities is present.

Hazardous drinkers are frequently described as engaging in denial, evasion, defensiveness, rationalization and manipulation. Research has not supported the concept that resistance and denial are attributes of addiction. Clients who disagree with clinicians and reject treatment are labeled as unmotivated, in denial, and resistant
(Miller, 1985; Miller and Rollnick, 1991). Treatment procedures may set up clients to react defensively through use of labeling (alcoholic, addict, manipulative, resistant), or giving clients no choice in selecting treatment goals. Use of adversarial tactics to "break down" clients can be counterproductive (Taleff, 1997).

Indeed, as discussed in an earlier section, confrontational counseling styles have been shown to promote resistance rather than change (Miller, 1998). The term confrontation assumes that denial must be aggressively torn down using authoritarian and adversarial approaches (Taleff, 1997).

Changes in the Addictions Field

Some of the emerging positive changes in the field of addiction and abuse treatment enhance client motivation and have important implications for the current study (Miller, 2001). Rather than focusing on client's limitations and deficits, the current emphasis is on identifying and enhancing client's strengths and competencies. Similar to an aspect of the moral model of addiction, responsibility for recovery lies with clients, but the judgmental aspect is missing. Also, there is a shift away from labeling clients. Use of a motivational style avoids labeling clients with names such as alcoholics, addicts, and abusers. Labeling tends to dehumanize clients and may enhance resistance. Use of empathy rather than authority and power is another emerging concept. Instead of using disciplinary penalties for rule infractions or other uses of power, clinician characteristics associated with clients motivation include empathy, warmth and supportive listening (Landry, 1996).
Current effective treatment is based on clients personal needs, which are assessed and evaluated at intake. Positive treatment outcomes have been shown with flexible program policies and a focus on individuals needs (Incardi, Tims & Fletcher, 1993). This treatment should include a partnership between clients and clinicians, rather than clients passively receiving treatment. A focus on earlier and less intensive interventions is supported by research indicating that successful use of early interventions may be more effective before clients have exhausted all personal resources. Use of brief motivational interventions is being offered increasingly in acute and primary health care settings (Samet, Rollnick, & Barnes, 1996). Less intensive treatments studied by Project Match (1997) were found to be as effective as more intensive therapies. For purposes of this study, it is hoped that even when treatment is restricted to a relatively brief period, it is still possible to influence clients motivation and effect change.

Significance for Nursing

The restructuring of healthcare in the United States has led to expansion of nursing roles and responsibilities. The shortage of primary care providers has led to education of advanced practice nurses to help meet the needs for health promotion and illness management (Hickey, Oimmette, & Venegoni, 2000). The majority of advanced practice nurses practice in primary care settings, the focus of the current study. The Pew Health Professions Commission (O’Neil, 1993) emphasized that advanced practice nurses should determine the most effective treatment for different conditions at the same time controlling costs. The Pew Commission’s competencies of health professionals for 2005 targets primary and secondary prevention strategies, expecting participation from the
client and family, and high quality, low cost integrated services. Nurses and advanced practice nurses functioning in primary care settings are in important positions to provide both primary and secondary prevention. Since the population of interest in the current study has been identified as hazardous drinkers, secondary prevention is the focus of the intervention. While both nurses and advanced practice nurses may be screening clients for alcohol use, advanced practice nurses with a therapeutic relationship with clients are positioned for motivational interventions with hazardous drinkers. Rather than send clients for more costly or difficult to access treatment, advanced practice nurses can assess the severity of the problem and use a motivational interviewing intervention. This reflects the recent recommendation from the Institute of Medicine (1996) that primary care providers should address a large majority of personal healthcare needs, developing a partnership with clients, within the context of family and community. These recommendations are similar to the principles of motivational interviewing interventions previously discussed. Furthermore, it is hoped that the study will demonstrate the ability of advanced practice nurses to administer motivational interventions, since counseling techniques are most commonly used by therapists in a counseling treatment setting. Adding this skill to the competencies of advanced practice nurses would be an invaluable asset.

In summary, this review of the literature provided an overview of the detrimental effects of hazardous alcohol use. A review of the factors leading to hazardous drinking provided an understanding of alcohol use and maintenance. Current interventions based on prevention and cessation programs were explored and limitations were discussed. The importance to nursing was emphasized. The review provided a brief overview of the
theory, principles, techniques, and strategies of motivational interviewing and proposed several potential benefits of utilizing motivational interviewing as an intervention program for hazardous drinkers in a community clinic setting.

Statement of the Problem and Hypothesis

It may be argued that current interventions for hazardous drinkers are inadequate for several reasons: First, barriers to treatment related to cost and travel may deter hazardous drinkers from seeking care. Additionally, alcohol treatment programs currently available at low or no cost to low-income clients in the communities in the study are spiritually based, which may not offer treatments most efficacious for clients. Cost-benefit analysis (Fleming et al., 2002) estimates that each $1 spent on brief motivational interventions saves $4.30 for the health care system. Less intensive treatments studied by Project Match (1997) were found to be as effective as more intensive therapies. Nurse practitioners may be well suited to provide motivational interventions in a primary care setting. Finally, using community clinic settings may provide an opportunity to identify hazardous drinkers requiring more help, who may otherwise go untreated (Bandura, 1997).

Therefore, it is hypothesized that motivational interviewing is an effective treatment approach in promoting positive alcohol related changes in hazardous drinking clients attending a primary care clinic. Furthermore, it is hypothesized that motivational interviewing is more effective than no treatment. It is expected that these effects can be shown on alcohol related measures, primarily, that the motivational interviewing intervention should reduce the frequency and quantity of alcohol use in hazardous drinkers.
CHAPTER 3

RESEARCH DESIGN AND METHODS

Design Overview and Rationale

This study targeted rural people at risk for alcohol dependence utilizing Community Health Care Centers in rural Southeastern Idaho. Hazardous drinkers were identified and randomly assigned to the intervention or control group. The treatment group received a one-time motivational interviewing intervention. Alcohol measures were taken at the time of the intervention and 6 weeks later. The control group received no treatment and measures were tested at pretest and 6 weeks later.

Rationale for the design was based on the review of the literature and consultation with Angelica Thevos, PhD. Internationally recognized, Thevos is a cross-culturally competent trainer of motivational interviewing and director of the National Institute and Alcohol Abuse and Alcoholism-funded Charleston Alcohol Research Center. Thevos (2000, 2001) applied motivational interviewing techniques to the adoption of safe water behaviors in Zambia. Her consultation helped guide the use of the screening tool (AUDIT), inclusion criteria, alcohol dependent measures and intervention and feedback of normative alcohol values during the motivational interviewing intervention. The time interval between pre- posttest was based on expert consultation, and the review of literature on GGT changes.
The study design was also reviewed with motivational interviewing trainer, Stephanie Wahab, PhD. Her feedback regarding the number of treatments was incorporated into the study design.

Participants

Eighty-six persons participated in the study by completing a screening assessment tool. Of the 32 persons with a positive screening score, 3 persons were unable to be contacted by phone, and the remaining 29 were recruited into the study. Twenty-five of the 29 completed both pre and posttest, 1 was a no show, and 3 participants did not return for the posttest. Consistent with the demographics of the region, 27 persons (of persons completing at least time one) were Caucasian (97%) and one was African American (3%). Fifteen were female and 13 were male.

The mission of federally funded community health clinics utilized in this study is to provide medical care to underserved people in the community. The sample population was drawn from four of five Community Health Care Centers in southeastern Idaho, and therefore is considered representative of under-served population. According to a chart review of one of the study clinics, 65% of the population is female, most are below the poverty level, and 40% have a documented mental illness. Twenty-eight percent of clients over age 18 reported a past history of alcohol abuse and 15% reported substance abuse other than alcohol. Participants with mental illness were included in the study. Sixty-four percent of participants in the current study reported some psychiatric diagnosis, discussed in detail in the result section.
Characteristics of the Community Health Centers

Idaho is a large, economically underdeveloped state. Twenty-one (48%) of Idaho's counties are designated as rural (≥ 6 persons/sq mile and no population center ≥ 20,000); 16 counties (36%) are "frontier" (<6 persons/sq mile and no population center). Historically, the state has high rates of poverty (e.g., 1990 census showed 38 of Idaho's 44 counties had poverty rates greater than 10%, and 3 had rates over 20%).

Providing health care in this state presents several challenges. The sparse population is often literally hours away from the nearest health care provider. The area's economy is not as strong as other regions and has difficulty attracting adequate numbers of health care professionals: there are documented shortages of nurses, doctors, etc. (Idaho Department of Health and Welfare, 1996). Thirty-four (77%) counties are designated, in whole or part, as health primary care shortage areas. At this time, Idaho has one of the highest suicide rates in the nation and alcohol is often a factor in these suicides (Idaho Department of Health and Welfare, 1999).

The Community Health Centers involved in this study are in federally designated underserved areas. The goal of Community Health Centers is to decrease barriers to health care and provide quality, integrated health care services to under and uninsured families and individuals. Clinics address health issues such as: management of chronic medical problems (hepatitis, diabetes, hypertension), routine office visits, gynecology, and counseling and medication management for acute and chronic mental health cases. Clients of the Community Health Centers typically have complex problems, and many have chronic mental health, alcohol/substance abuse, and/or disability issues.
The five clinic sites are located within a 50 miles radius of a centralized city in southeastern Idaho. This city has a population of approximately 50,000, the four other clinics are in communities of 5,000 or less. Directly pertaining to this project, a random sample of charts (200) found 22% presented problems with alcohol (10% over the national average) (chart audit, Old Town Community Clinic, 2000).

Many indigent and transient people use Community Health Clinics. This includes, but is not limited to, working poor, social service recipients, homeless, migrant agricultural workers, newly released inmates of the criminal justice system, etc. Penetrating such special populations is often difficult. Lack of trust, shame, social dysfunction, cultural dictates of rural populations, or other causes may affect service use. For example, although a low cost alcohol treatment program called Road to Recovery is available, persons may be reluctant to use this resource due to social stigma.

All clinics are situated in neighborhood settings and many people walk to the clinics. Clients have complex health problems and may have been in jail or prison programs or in shelters for homeless and/or abused women and their children. Other clients are residents from these low-income, underserved communities. In addition to providing primary care intervention, clinics address health promotion activities such as smoking cessation, nutrition, and education in managing chronic health conditions. All clinics exist in sites already accepted by relatively large numbers of targeted populations for this study, and in-take procedures indicate a high proportion of “word-of-mouth” referrals within the populations. Therefore, testing the effectiveness of motivational interviewing intervention using this setting and population added to the current literature on motivational interviewing.
Recruitment

Clients over age 18 attending the five Community Health Clinics during the 10 month study period were given the opportunity to assess themselves for hazardous alcohol use with the Alcohol Use Disorders Identification Test (AUDIT) instrument as described below. A sign was posted at the clinics briefly describing the study with the AUDIT instrument and pen posted on a clipboard below the sign. An introductory letter was attached to the AUDIT describing the study, asking interested persons to write their name and phone number on the form (Appendix D). The AUDIT was self-administered and placed in an envelope that was sealed by the client. The sealed envelopes were placed in a box and later retrieved by the researcher. The researcher contacted by telephone clients with a positive score (8 or greater) on the AUDIT instrument and described the study. If interested in participation, clients were screened for inclusion criteria and if eligible, offered an opportunity to participate in the study. Participants were randomly assigned to the intervention or control group using a table of random numbers. Clients with reading and writing difficulties reported using either spouses or friends to help them complete the AUDIT form.

Inclusion Criteria

Inclusion criteria were based on a review of the literature (Bien et al., 1993; Fleming & Manwell, 1999; WHO, 1996). Clients were eligible for inclusion in the study if they entered the clinics during the study period, and met the criteria for hazardous alcohol use as defined by the AUDIT measure (score of 8 or greater). They had to be willing to complete follow-up evaluation forms 6 weeks after the intervention. Clients
were excluded if they were pregnant, younger than 18 years of age, or reported symptoms of suicide. Age restrictions were set to avoid maturational threats to internal validity. Since the researcher practiced at the five clinics in the study, clients of the researcher were excluded.

Retention

Strategies to minimize attrition included incremental payment of $5 per visit (total compensation $10) and phone reminders between pre and posttest. In order to reduce the rate of missed appointments, participants were reminded by telephone the week and day before each visit.

Ethical Considerations

It was important that providers, clinic personnel or other clients were not involved in deciding who was in the study. Any client over age 18 accessing clinics during the study period, with a positive AUDIT score, was eligible for participation, unless exclusion criteria were met. Coercion could also occur if participants received advantages not available to other clients. The rather low incentive pay was not considered substantial. It was not known whether the intervention was an advantage. The community clinics utilized in this study had mental health services available within the Pocatello area.

IRB approval was obtained from the University of Utah and approval from Health West Inc., the firm that managed the five health clinics. Written consent was obtained from control and treatment group participants (Appendix C). Consent forms for the
participants were presented in printed form and read to persons with reading difficulties (four participants). All participants received a copy of the signed consent form. The researcher ensured that participants continued to understand their right to withdraw from the study and right to refuse to answer questions that made them uncomfortable throughout the study.

Visit One

The researcher scheduled interviews by phone, which took place in private consulting rooms in the Community Health Center setting closest to where the participant lived. Written informed consent was obtained. Data were gathered on number of drinks per day, symptoms of alcohol withdrawal, and treatment history for alcohol problems. Participants completed flow sheets examining drinking with assistance from the researcher if needed. Participants who declined to complete the flow sheet themselves were assisted by the researcher. A 6-week calendar type format asking number of drinks by beverage type (beer, hard liquor or wine) was summed to total number of drinks per day and week. The past 6-week use of self-help meetings, medications, and health professional contact was queried. Descriptive data gathered at intake included age, gender, educational level, psychiatric diagnosis, race, legal problems related to alcohol, and living arrangements such as marital status.

Serum gamma-glutamyltranferase (GGT) levels were obtained when the baseline assessment interview of study participants was done. The researcher drew approximately 5 milliliters of blood for GGT blood test using sterile technique. An approved laboratory, Quest Diagnostics Incorporated, analyzed GGT samples. Results were mailed to the study office, not placed in the medical record of participants, as per the consent form.
After completing the alcohol flow sheet and the GGT blood test, control
participants were scheduled for follow-up appointments in 6 weeks. They were paid $5
for participation in the first visit.

After completion of the alcohol flow sheet and the GGT blood test, intervention
participants received the motivational interviewing intervention, which is described
below. The intervention session incorporated baseline data and AUDIT scores and lasted
45-60 minutes. Participants scheduled a 6 week follow-up appointment. Intervention
participants were paid $5 for the first visit.

**Visit Two**

The researcher scheduled the second visit by phone, which took place in private
consulting rooms in the Community Health Center closest to the participant. Phone
reminders were used prior to visit two for all participants. Verbal informed consent was
obtained again and participants were informed of the GGT results from the first visit. A
GGT blood test was drawn and alcohol flow sheet data gathered on number of drinks per
day, symptoms of alcohol withdrawal, and treatment for alcohol problems in the previous
6 weeks. Participants were paid $5 for the second visit.

**Motivational Interviewing Intervention**

The intervention consisted of one motivational interviewing session, lasting about
45 to 60 minutes. The literature reviewed supported use of one to three sessions, and one
session was chosen to minimize retention problems with participants. Prior to the study
the researcher received week-long training in motivational interviewing from a certified
motivational interviewing trainer. To check for the accuracy of the intervention, three random motivational interviewing sessions were audiotaped for verification by a motivational interviewing trainer. The trainer and licensed professional counselor, Diane Kempson, PhD, verified proper motivational interviewing technique and gave verbal feedback to the researcher. The feedback was incorporated into successive motivational interviewing sessions.

The motivational interviewing sessions followed these stages: setting the stage, asking permission to discuss the topic of alcohol, assessing readiness and confidence, exploring ambivalence, strengthening commitment, options, plan negotiation and closing. FRAMES (Feedback, Responsibility, Advice, Menu, Empathy, and Self-efficacy) guidelines were followed, which included these aspects (Miller, 1996):

- **Feedback** included personal feedback on the participant's drinking relative to norms in the United States (Appendix E). Information gathered at intake (AUDIT score, 6-week alcohol flow sheet data, past 6-week use of self-help meetings, medications, health professional contact, and legal problems related to alcohol) was incorporated into the motivational intervention.
- **Responsibility** emphasized personal responsibility for change.
- **Exploring ambivalence** (Appendix G).
- **Advice** included clear recommendations or advice on the need for change in a supportive manner. Advice varied from cutting down to recommendations to stop due to extremely high levels of drinking and related health problems (Appendix F).
• Menu included varieties of options that were available to participants in making change. The menu included discussing change options discussed by participants, such as using social support, a time-frame for change and possible sequence of change.

• Empathy and a warm, reflective supportive counselor style were used.

• Self-efficacy or the participant's belief in is/her ability to successfully make a behavior change was reinforced using supportive messages.

Key messages in a motivational interviewing session included discussing positive aspects about using alcohol, problematic aspects about using alcohol, and if participants verbalized there was a problem, how and what would participants like to change about drinking alcohol (Miller, 1996).

Diffusion of Treatment

Since the population of communities in the study was small, participants had an opportunity to communicate with one another, posing threats to internal validity. Diffusion of treatment and resentful demoralization of respondents receiving less Intervention group participants were asked to refrain from sharing the contents of the motivational interviewing session with control group participants until after completion of the study.

AUDIT (Alcohol Use Disorders Inventory Test) (Appendix A)

The AUDIT was developed from a six-country World Health Organization collaborative project as a screening instrument for hazardous and harmful alcohol consumption. The 10-item pencil and paper questionnaire covers the domains of alcohol
consumption, drinking behavior, and alcohol related problems. Responses to each question are scored from 0 to 4, giving a maximum score of 40. Approximately 2 minutes is required to complete the AUDIT, self-administered or by interview. Hand scoring takes 1 minute to complete. The cut-off score of 8 was determined through the review of literature.

Allen, Litten, Fertig, and Babor's review of research on AUDIT (1997) note that at the usual cut-off score of 8 points, sensitivities for the AUDIT were generally in the mid .90s, with an average 80% specificity. In clinical screening for hazardous alcohol use, sensitivity is more important than specificity, because false-positive cases can be ruled out by more extensive diagnostic tests (Allen et al., 1997). Conigrave and Hall (1995) performed a longitudinal study examining the performance of the AUDIT in predicting alcohol-related problems with 330 ambulatory care clients. At initial interview, 37% of the clients scored 8 or greater on AUDIT. At this cut-off point, AUDIT detected 95% of those with current social problems with alcohol, 94% of those with hazardous drinking, and 97% with frequent drinking likely to result in intoxication. AUDIT achieved good discrimination for the outcome measures alcohol related social problems; alcohol related outpatient attendance and admission, with the Area Under the Curve (AUC) from 0.82-0.87 (CI 0.73-.87). The sensitivity and specificity of AUDIT in predicting various adverse endpoints used the cut-off 8 and the maximum discrimination for each endpoint. The recommended cut-off point of 8 was reasonable for a variety of endpoints, with a sensitivity range 43-82 and specificity range 66-85 (Conigrave & Hall, 1995).
Conigrave, Saunders, and Reznik (1995) also examined the ability of AUDIT to predict alcohol-related illness, social problems, hospital admissions and mortality in 330 ambulatory care clients over a 2-3 year period. At initial interview, AUDIT detected 94-97% of participants with hazardous alcohol consumption or alcohol related health or social problems with a specificity of 78-88%. Those scoring 8 or higher on AUDIT were significantly more likely to experience social problems from drinking (61% versus 10%) than those with scores under 8. At follow-up those who scored 8 or more on AUDIT were 6.6 times more likely to report heavy drinking, and 6.9 times more likely to report frequent drinking with intoxication (Conigrave et al., 1995).

Two studies offer evidence that the AUDIT is a reliable and valid instrument in a primary care setting (Piccinelli & Tessari, 1997; Schmidt & Barry, 1995). Schmidt and Barry (1995) conducted a four-part study to test the predictive ability of the AUDIT in a general medicine, teaching clinic with 132 participants. The internal consistency reliability coefficient was .77, indicating that participants demonstrated adequate consistency in their responses. The predictive validity was determined by comparing the AUDIT scores with participants who were diagnostic interview positive with those who did not meet these criteria. Using a cut-off score of 4 the sensitivity was .77, and specificity was .73. The sensitivity decreased to .38, and specificity increased to .95, using a cut-off score of 8.

Piccinelli and Tessari (1997) conducted a validity study with 482 clients aged 18-65 attending a primary care clinic. Receiver operating characteristic analysis investigated the screening properties of the AUDIT. This provides an overall index of diagnostic accuracy by plotting sensitivity against the false positive rate for all possible cut-off
scores. The area under the receiver operating characteristic curve (AUC) was 0.91 (CI 0.919-0.944) when the AUDIT was used to detect alcohol dependence. Harmful alcohol use AUC was 0.90, (CI 0.88-0.92), and hazardous alcohol use AUC was 0.92, (CI 0.90-0.93). Since a value of 1.0 represents perfect discriminatory ability, the performance of the AUDIT questionnaire was high. The total cut-off score of 5 was associated with a sensitivity of 0.79, a specificity of 0.95, and a positive predictive value of 0.73.

Volk (1997) examined the operating characteristics of the AUDIT as a screen for at-risk drinking, using a probability sample of 1333 multiethnic primary care clients. Results from the analysis of covariance showed no evidence of differences of AUDIT scores by racial/ethnic subgroup (main effects $\mathbf{F} = 0.93, p = 0.394$, interactions $\mathbf{F} = 1.10, p = 0.362$). The positive predictive value of the AUDIT, or the likelihood the participant has an alcohol problem given a positive score, was calculated using cut-off scores from 4-10. The predictive value of a positive AUDIT screen for at-risk drinking with a cut-score of 8 had sensitivity of 51% and specificity of 96%. A prior probability of problem drinking for a cut-score of 8 was 40%, $p = 0.05$ (Volk, 1997). In this client population, the AUDIT appears to be unbiased in measuring at-risk drinking.

**Serum Gamma-Glutamyltransferase**

Serum Gamma-Glutamyltransferase (GGT) is a glycoprotein whose activity has been found to be elevated in most hepatobiliary diseases, with a variety of medications, and in association with relatively heavy alcohol consumption (Daeppen, Schoenfeld-Smith, Smith, & Schuckit, 1999). The possible mechanisms responsible for GGT elevation in individuals with persistent alcohol consumption includes the induction of the
enzyme by ethanol, increased synthesis secondary to cholestasis, the release of the
enzyme by damaged hepatocytes, and the increased permeability of hepatic cell
membranes resulting in the release of GGT. Biological markers may be useful as an
adjunct to self-report when a participant’s history is unreliable. GGT is characteristically
elevated in persons with a long history of daily drinking, which may predispose them to
chronic alcohol-related problems. The GGT rises quickly and remains elevated after 3 or
more weeks of heavy daily alcohol consumption. The GGT has a sensitivity range of 50-
90%, more sensitive than other liver function tests. The level moves toward normal about
4 weeks after consumption ends, making it a useful monitoring tool (Graham, 2000). The
laboratory reference range for the GGT is 2-60 U/l for females and 2-80 U/l for males.

A review of 17 studies found an average sensitivity of 52% for GGT to identify
1,233 alcohol dependent participants (Daeppen et al., 1999). Elevated GGT levels (>60-
80 U/l) have been shown in two studies to be predictive of increased morbidity and 6-12
times increased mortality in a 3-5 year time periods after screening (Conigrave, 1995).

A drawback of the GGT is that it may be elevated due to causes other than alcohol
use such as medications, trauma, diabetes, heart, kidney or biliary tract disease (Williams
& Wilkins, 1998). For this reason, participants were asked about use of medications and
health problems such as hepatitis and cirrhosis, which may affect the GGT.

The Six-Week Alcohol Quantity/Frequency Form (Appendix B) was used at
baseline and 6 weeks posttest. A 6-week calendar format asking number of drinks by
beverage type: beer, hard liquor or wine was summed to total number of drinks per day
and week. (1 drink = 12 ounces beer = 5 ounces wine = 1.5 ounces of spirits or hard
liquor).
Data Analysis

As previously described, the primary purpose of this study was to test the effectiveness of motivational interviewing in reducing drinking in hazardous drinkers. Therefore, the primary analyses focused on the treatment effects of a one-time motivational interviewing session versus a control group across two points in time. Measurements were obtained prior to the onset of the first session and 6 weeks later. Preliminary analyses were conducted to assess for any possible pretreatment differences between the groups. ANOVA and Wilcoxon Signed Ranks test were used to assess the overall effectiveness of the intervention on the dependent variables. The level of significance was set at .05. In addition, correlational analyses were used to investigate the effects from the alcohol-related variables. Demographic variables were analyzed and described. The Statistical Package for the Social Sciences (SPSS/10.0 for Unix) was used for data analysis.
CHAPTER 4

ANALYSIS

Introduction
This chapter will describe the results and analyses of the data for this experimental study. The hypothesis was that there would be a decrease in alcohol use in hazardous drinkers after a motivational interviewing intervention.

Description of the Sample
The results from the intake demographic screening indicated the mean age of the participants was 37, with an age range of 19-55. This age is higher than the alcohol use prevalence data for the United States, with the peak age of prevalence for alcohol age 21. However, the average age of clients attending the Community Health Centers is around 40. Of the 28 participants who began the study, 15 participants were female (53%), and 13 were male (46%). Although males are more likely to abuse alcohol, 4.9 % versus 2.6% for women, (U.S. Department of Health and Human Services, 2000), the clinic populations are weighted more toward women, who utilize woman’s health services at a higher rate than men use health services. Woman’s health services are also linked to child-bearing and contraception, whereas men’s health services are likely acute and chronic problems. Table 1 shows the demographic data for age and educational status.
Table 1. Descriptive Statistics of Age and Educational Status

<table>
<thead>
<tr>
<th>Variable</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>19</td>
<td>55</td>
<td>37.56</td>
<td>10.02</td>
</tr>
<tr>
<td>Years Education</td>
<td>8</td>
<td>18</td>
<td>12.9</td>
<td>2.11</td>
</tr>
</tbody>
</table>

N=28

Examination of participants educational status reveals that over half (53%) completed either technical school or some college. Thirty-nine percent of participants completed high school. This is similar to the socioeconomic status of most clinic clients. Two participants reported completing some or all of grade school, and these participants reported reading difficulties, or illiteracy. Consistent with the ethnic demographics of the region, the race of participants was 97% Caucasian and 3% African American.

Psychiatric diagnoses were an important finding of this study. Of the 28 persons who entered the study, only 35% of participants reported no psychiatric diagnoses. Fifty percent reported depression, 3% reported anxiety, and 10% reported bipolar disorder. When separated into treatment and control groups, the rate of depression remained 50%. This rate is higher than the earlier reported chart review, which reported a 40% rate of psychiatric problems at one of the community clinics. Respectively, for treatment and control groups, the rate of bipolar disorder was 7% versus 14%. Anxiety was reported by 7% of the control group only. Table 2 shows the distribution of psychiatric diagnosis by group. An interesting finding was that only 8 participants (25%) were currently taking prescribed medication for depression; other medications reported were for hypertension (2), asthma (2) and osteoarthritis (2). One person was taking medication prescribed for bipolar disorder.
Legal problems were reported by 42% of the participants, one of whom reported incarceration in prison for DUI (driving under the influence of any intoxicating substance), and the remaining 11 persons reported either DUI offenses or battery charges while intoxicated. Withdrawal symptoms such as tremors, hallucinations or vomiting were reported by 18% of the participants, and were generally self-reported as not severe. Seven percent (2 participants) reported attending either Alcoholics Anonymous or some type of support meeting during or before the study period.

**Measures of Drinking (AUDIT)**

Measures of drinking were first assessed using AUDIT scores. As noted in the review of literature, higher scores typically reflect more serious problems. The mean AUDIT score was 19.21, with a standard deviation of 8.49. The minimum score (for non drinkers) is 0 and the maximum possible score is 40. The distribution of scores was relatively spread evenly between the participants, with skewness of 1.73 and kurtosis of 4.56. A score of 8 or more indicates a strong likelihood of hazardous or harmful alcohol consumption and was used as the cut-off for recruitment into the study. Table 3 presents the range of AUDIT scores.
Table 3. AUDIT Scores

<table>
<thead>
<tr>
<th>Variable</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>AUDIT score</td>
<td>8</td>
<td>37</td>
<td>19.21</td>
<td>8.49</td>
</tr>
</tbody>
</table>

N=28

Analysis of Between Group Effects Pre-Post

Eighty-six people completed the screening assessment tool. Of the 32 persons with a positive screening score, 3 persons were unable to be contacted by phone, and the remaining 29 were recruited into the study. Twenty-five of the 29 completed both pre and post-test, 1 was a no show, and 3 participants did not return for the posttest.

Appropriate statistical tests were used to assess the overall equality of the treatment and control groups. Chi-square tests were used when the demographic variable was categorical. Independent t-tests or Mann-Whitney U tests were used to compare the groups on quantitative variables, depending on the normality of the data. Chi-square tests of independence (with or without the continuity correction as appropriate) were used to assess the independence of group membership and the initial categorical demographic variables.

The variables of gender ($\chi^2_1 = 0.00, p=1.00$), education ($\chi^2_5 = 0.958, p=0.966$), legal problems ($\chi^2_1 = 0.146, p=0.703$), living arrangements ($\chi^2_2 = 0.720, p=0.698$), symptoms of withdrawal ($\chi^2_1 = 0.974, p=0.326$), use of meetings ($\chi^2_1 = 0.00, p=1.00$) and physician visits ($\chi^2 = 0.00, p=1.00$) were not significantly related to group membership. Race and psychiatric diagnosis had categories with too few participants to assess their relationship with group.
An independent t-test showed no difference in average age between the two groups. The Mann-Whitney U test showed no significant difference between the two groups in the time 1 GGT, or the time 1 number of drinks per day.

The effects of the motivational interviewing treatment were measured by the primary outcome measures of drinks per day and GGT. The analysis of the variable drinks per day will be addressed prior to GGT. The mean number of drinks per day (n=25) at pretreatment was 4.5, and the mean number of drinks per day posttreatment was 2.89. Table 4 lists the time 1 and time 2 scores on the dependent variable drinks per day.

This dependent measure was analyzed by repeated measures design with time (pre vs post-treatment) as the within subjects factor and group (treatment vs control) as the between subjects factor. This mixed design allowed for the testing of changes over time as well as a possible interaction between the group and time effects. At time 1 (pretreatment), the control group drank 4.37 (mean) drinks per day, while the treatment group drank 4.65 (mean) drinks per day. At time 2 (posttest) the control group drank 3.77 (mean) drinks per day, while the treatment group drank 1.95 (mean) drinks per day. Table 5 lists the pre and postmean scores on the dependent variable drinks per day by group.

Table 4. Time 1 and 2 Drinks per Day

<table>
<thead>
<tr>
<th>Variable</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time 1 drinks/day</td>
<td>.57</td>
<td>12</td>
<td>4.50</td>
<td>3.37</td>
</tr>
<tr>
<td>Time 2 drinks/day</td>
<td>0</td>
<td>12</td>
<td>2.89</td>
<td>3.70</td>
</tr>
</tbody>
</table>

N=25
<table>
<thead>
<tr>
<th>Group</th>
<th>Mean</th>
<th>SD</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Time 1</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Treatment</td>
<td>4.65</td>
<td>3.36</td>
<td>12</td>
</tr>
<tr>
<td>Control</td>
<td>4.37</td>
<td>3.51</td>
<td>13</td>
</tr>
<tr>
<td>Combined</td>
<td>4.50</td>
<td>3.37</td>
<td>25</td>
</tr>
<tr>
<td><strong>Time 2</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Treatment</td>
<td>1.95</td>
<td>3.32</td>
<td>12</td>
</tr>
<tr>
<td>Control</td>
<td>3.77</td>
<td>3.95</td>
<td>13</td>
</tr>
<tr>
<td>Combined</td>
<td>2.89</td>
<td>3.70</td>
<td>25</td>
</tr>
</tbody>
</table>

Additionally, three participants (10%) reported being totally abstinent at post-treatment. Two participants were from the treatment group and one from the control group. In the treatment group, at time 1, the drinks per day ranged from .57 to 12 drinks per day. Half of these participants drank 5 or less drinks per day; the remainder drank 5-12 drinks per day. After the intervention at time 2, the treatment participants all drank 4 drinks or less per day, except for one participant, who drank 12 drinks per day. None of the participants who reported abstinence reported withdrawal symptoms.

Box's test of equality of covariance matrices was used to determine whether the variance-covariance matrices are equal across all levels of the between-subjects factor. The p value of .129 indicates that the assumption has been met. Mauchly’s test of Sphericity was not significant, indicating that the assumption of compound symmetry has been met, therefore univariate results are reported.
Table 6. Tests of Within-Subjects Effects

<table>
<thead>
<tr>
<th>Source</th>
<th>Type III Sum of Sq.</th>
<th>DF</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time</td>
<td>34.07</td>
<td>1</td>
<td>34.07</td>
<td>12.136</td>
<td>.002</td>
</tr>
<tr>
<td>Time by Group</td>
<td>13.77</td>
<td>1</td>
<td>13.77</td>
<td>4.90</td>
<td>.037</td>
</tr>
</tbody>
</table>

Table 6 lists the tests of within-subjects effects. The within-subjects, main effect is time. The F is 12.136 and is significant at the 0.002 level. The within-subjects interaction is time by group. The F is 4.908 and is significant at the 0.037 level. This indicates the change in number of drinks per day differed significantly between the intervention and the treatment groups. The interaction of treatment effects for average number of drinks per day is presented in Figure 1.

Figure 1. The interaction of treatment effects on average number of drinks per day
Levene's test of equality of error variances was used to determine whether the variances of the two groups (time 1 drinks per day and time 2 drinks per day) are equivalent for both measures. The $p$ values (.729, .178) indicate that for both measures the assumption has been met. The Kolmogrov-Smirnov test was used to assess normality of the response variable. Time 1 drinks per day did not violate normality ($p = 0.097$); however, time 2 drinks per day did violate normality ($p < 0.001$).

Due to the small sample size and the violation of normality, nonparametric statistics were also used to analyze the difference between time one drinks per day and time two drinks per day separately for the two groups. Wilcoxon Signed Ranks Test was significant for the treatment group ($Z = -2.845, p = .004, 2$-tailed), but not significant for the control group ($Z = -1.482, p = 0.138, 2$-tailed). The results of the Wilcoxon Signed Ranks Test are shown in Table 7.

Table 7 Wilcoxon Signed Ranks Test

<table>
<thead>
<tr>
<th>Group</th>
<th>t2drday - t1drday</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treatment</td>
<td>Z</td>
</tr>
<tr>
<td></td>
<td>Asymp. Sig. (2-tailed)</td>
</tr>
<tr>
<td></td>
<td>-2.845(a)</td>
</tr>
<tr>
<td></td>
<td>.004</td>
</tr>
<tr>
<td>Control</td>
<td>Z</td>
</tr>
<tr>
<td></td>
<td>Asymp. Sig. (2-tailed)</td>
</tr>
<tr>
<td></td>
<td>-1.482(a)</td>
</tr>
<tr>
<td></td>
<td>.138</td>
</tr>
</tbody>
</table>
The effects of the motivational interviewing treatment on hazardous drinking were also assessed by analyzing the differences in the alcohol dependent measure GGT. The mean GGT for Time 1 was 71.24, with a range of 9-400. Time 2 GGT mean was 57.76, with a range of 10-429 and is shown in Table 8.

The distribution of the GGT did not meet assumptions for parametric statistics due to highly positive skewness and kurtosis. Therefore, nonparametric statistics were used to analyze the difference in time (pretreatment vs posttreatment) by group (treatment vs control). The Wilcoxon signed ranks test was used to examine the differences between Time 1 and Time 2 for the treatment group and the control group separately. The results of the Wilcoxon signed ranks test indicated that the 12 participants who took part in the clinical intervention significantly reduced their mean GGT levels from pretest (GGT = 66.25) to posttest (GGT = 34.81) (p = .036). The control group (n = 13) did not significantly decrease their GGT (p = 0.068). Table 9 lists the descriptive statistics for the pre and post mean scores on the dependent variable GGT by group.

<table>
<thead>
<tr>
<th>Table 8. Time 1 and Time 2 GGT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variable</td>
</tr>
<tr>
<td>Time 1 GGT</td>
</tr>
<tr>
<td>Time 2 GGT</td>
</tr>
</tbody>
</table>

N=25
Table 9. Pre and Posttest Mean Scores GGT by Group

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean</th>
<th>SD</th>
<th>N</th>
<th>p*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treatment</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time 1</td>
<td>66.25</td>
<td>86.35</td>
<td>12</td>
<td>0.036</td>
</tr>
<tr>
<td>Time 2</td>
<td>34.81</td>
<td>21.44</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>Control</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time 1</td>
<td>75.85</td>
<td>113.60</td>
<td>13</td>
<td>0.068</td>
</tr>
<tr>
<td>Time 2</td>
<td>79.38</td>
<td>118.69</td>
<td>13</td>
<td></td>
</tr>
</tbody>
</table>

*The calculated two tailed p-value is for the Wilcoxon signed ranks test.

Correlations of the Alcohol Variables

Since the alcohol measures were interval level data, the Pearson Product-Moment Correlation Coefficient was used to examine any relationships between the variables drinks per day and GGT. This two-tailed test measuring the strength of the linear relationship between variables showed there was significant correlation among the variables.

There was a strong linear correlation between time 1 GGT and time 2 GGT ($r = .817, p = .000$). This indicates that for a higher time 1 GGT, time 2 GGT is also high. There was a strong linear correlation between time 1 drinks per day and time 2 GGT ($r = .702, p = .000$). This indicates that higher number of drinks per day is associated with higher GGT levels, which confirms the validity of the self-reported drinks per day.

There was a moderate linear relationship between time 1 GGT and time 2 drinks per day ($r = .614, p = .001$), time 1 drinks per day and time 2 drinks per day ($r = .594, p = .003$), time 1 drinks per day and time 2 GGT ($r = .558, p = .006$). The results of the Pearson Product-Moment Correlation Coefficient are shown in Table 10.
Table 10 Pearson Product-Moment Correlation Coefficient

<table>
<thead>
<tr>
<th></th>
<th>Time 1 dr/day</th>
<th>Time 1 GGT</th>
<th>Time 2 dr/day</th>
<th>Time 2 GGT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time 1 dr/day</td>
<td>.164</td>
<td>.594</td>
<td>.558</td>
<td></td>
</tr>
<tr>
<td>Time 1 GGT</td>
<td></td>
<td></td>
<td>.644</td>
<td>.817</td>
</tr>
<tr>
<td>Time 2 dr/day</td>
<td></td>
<td></td>
<td></td>
<td>.702</td>
</tr>
<tr>
<td>Time 2 GGT</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Correlation is significant at the 0.01 level (2-tailed)

Correlations of the demographic variables were significant at the .05 level (one-tailed) for only two variables. There was a moderate negative correlation between AUDIT and withdrawal symptoms ($r = -.535$, $p = .003$) and a moderate negative correlation between AUDIT and group ($r = -.385$, $p = .043$).

Summary

The results of the current investigation found that motivational interviewing is an effective intervention for hazardous drinkers in a Community Health Clinic setting. The dependent measure drinks per day was analyzed by repeated measures design with time (pre vs posttreatment) as the within subjects factor and group (treatment vs control) as the between subjects factor. This mixed design allowed for the testing of changes over time as well as a possible interaction between the group and time effects. At time 1 (pretreatment), the control group drank 4.37 drinks per day, and the treatment group drank 4.65 drinks per day. At time 2 (posttest) the control group drank 3.77 drinks per day, and the treatment group drank 1.95 drinks per day. The within-subjects, main effect
is time. The F is 12.136 and is significant at the 0.002 level. The within-subjects interaction is time by group. The F is 4.908 and is significant at the 0.037 level. This indicates the change in number of drinks per day differed significantly between the intervention and the treatment groups.

The effects of the motivational interviewing treatment on hazardous drinking were also measured by the alcohol dependent measure GGT. The Wilcoxon signed ranks test was used to examine the differences between time 1 and time 2 for the treatment group and the control group separately. The results of the Wilcoxon signed ranks test indicated that the 12 participants who took part in the clinical intervention significantly reduced their mean GGT levels from pretest (GGT = 66.25) to posttest (GGT = 34.81) (p = .036). The control group (n = 13) did not significantly decrease their GGT (p = 0.068). The Pearson-Product Moment Correlation was used to study relationships between the variables and found there was significant correlation among the alcohol related variables.
CHAPTER 5

DISCUSSION OF FINDINGS

In exploring the findings from the present study, this discussion will be organized around the following questions regarding hazardous drinkers. First, what is the effectiveness of motivational interviewing with hazardous drinkers in a community setting? Second, what variables moderated the effects of motivational interviewing? Third, what are the characteristics of the hazardous drinkers who participated in the current study? Fourth, what are some identified limitations of this particular study? Finally, what recommendations can be made for future hazardous drinkers intervention programs?

The Effectiveness of Motivational Interviewing

Was motivational interviewing an effective intervention for hazardous drinkers? Yes, consistent with the predictions, drinkers who participated in the study significantly decreased the average number of drinks per day. There was also a significant decrease in the GGT from pretest to posttest.

Were these results clinically significant? From an abstinence aspect, three participants (10%) reported being totally abstinent at posttreatment. Two of these were from the treatment group. The first had time 1 drinks/day = 2, time 1 GGT = 25, time 2 GGT = 14. The second had time 1 drinks/day = 8, time 1 GGT = 146, time 2 GGT = 66. The control group had time 1 drinks/day = 3.5 and time 1 GGT = 15, time 2 GGT = 16.
In the treatment group, at time 1, the drinks per day ranged from .57 to 12 drinks per day. Half of these participants drank 5 or fewer drinks per day. The remainder drank 5-12 drinks per day. After the intervention at time 2, the treatment participants all drank 4 drinks or fewer per day, except for 1 participant, who drank 12 drinks per day. From a harm reduction standpoint (Marlett et al., 1988), any decreases in drinking show some clinical utility of motivational interviewing as an effective alcohol intervention.

Variable Effects on Treatment Outcomes

It was hypothesized that several variables might influence the overall effectiveness of the treatment program. It is possible that factors such as psychiatric diagnosis or medication use could have affected the outcome of the treatment. A recent study of hazardous drinkers drinking a least 29 drinks per week had twice the risk of mental disorder as lifetime abstainers. The current hazardous drinkers were two to three times more likely to have mood disorders and one and one half to two times as likely to have anxiety disorders (Ross, Rehm, & Walsh, 1997).

In this study, depression was reported by 50% of participants in the intervention and control group. Bipolar disorder was reported in 7% of the treatment participants and 14% of the control group. Anxiety was reported by 7% of the control group only. Forty-two percent of persons in the control group reported taking medications for psychiatric conditions, while none of the persons in the intervention group reported taking medications for psychiatric conditions despite half of them reporting depression either currently or previously. Analysis of medications used revealed that only 1 participant reported current use of medication that was metabolized by the liver, which could have
resulted in an elevated GGT. However, this participant’s (with a history of bipolar disorder) GGT scores were 43 (pretest) and 42 (posttest), not in the higher range of GGT scores. Other undisclosed reasons for elevated GGT scores may include liver disease such as hepatitis or cirrhosis.

The wide range of AUDIT scores (from 8-37) may have included participants who were not only hazardous but dependent drinkers, although it was hoped the intervention could be beneficial to any level of drinker. Analyzing the 28 pretest participant’s drinks per day, 12 participants met the criteria for increased risk for alcohol abuse as defined by the National Institute on Alcohol Abuse and Alcoholism (NIAAA, 2000). This definition is greater than 14 drinks per week or greater than 4 drinks per occasion for men, or greater than 7 drinks per week or greater than 3 drinks per occasion for women. These 12 participants drank over 5 drinks per day, with two participants drinking 11 and 12 drinks per day. It is likely that the heavier drinkers were more dependent on alcohol. However, Miller and Rollnick’s (2002) review of controlled clinical trials showed positive benefit in 11 of 12 studies treating drinking problems, which include alcohol abuse and dependence.

The Characteristics of Hazardous Drinkers

As the previously reported results indicated, motivational interviewing was effective in producing positive changes in the hazardous drinkers who participated in the current study. What were the characteristics of the study participants? In general, they were a cross section of the community clinic clients who had succumbed to the various attractions of drinking. Although most participants either drank heavily certain days of
the week (binge-drinking), some drank daily at high levels. They ranged in age from 19 to 55. Most lived with one other person or with children. Seven percent (two participants) reported attending either Alcoholics Anonymous or some type of support meeting during or before the study period. Legal problems were reported by 42% of the participants, one of whom reported incarceration in prison for DUI (driving under the influence of intoxicating substances), and the remaining 11 persons reported either DUI offenses or battery charges while intoxicated. Over half had seen a health care provider in the past 6 weeks for a medical problem unrelated to alcohol.

Factors Contributing to the Effectiveness of the Intervention

The present study is consistent with other investigations on the effectiveness of motivational interviewing in a clinical practice setting (Bien et al., 1993; Handmaker, Miller & Manicke, 1993; Miller et al., 1993). The fundamental concepts of the motivational interviewing approach contributed to positive therapeutic changes in a sample of hazardous drinkers. It is argued that the effectiveness of the motivational interviewing program resulted from the incorporation of the principles as defined by Miller and Rollnick (1991). As the researcher reviewed the results of the various assessments (e.g., AUDIT, 6-week alcohol quantity/frequency, etc.), use of listening skills, empathic reflections, and summary statements demonstrated to the participant that he or she was truly being heard.

It was also encouraging that the various assessments used in the study did have some therapeutic effects. It is noted that even the control group reduced the amount of drinks per day. Most control group participants were curious about their GGT results at
visit two. One control group participant who worked as a bartender wanted to be notified of time two GGT as she had "cut down on her own" during the study period. For some treatment participants, comparing their AUDIT score and drinking levels with United States standards was motivating.

In summary, the effectiveness of motivational interviewing with hazardous drinkers could be attributed to several factors. First, the researcher avoided using confrontation, or arguing with participants, to promote change. The researcher tried to understand and relate to participants from his or her perspectives and work in a collaborative manner to help determine goals for treatment. Second, the researcher attempted to resolve ambivalence by exploring shifts in readiness-to-change. Third, the motivational interviewing environment promoted a collaborative rather than authoritarian relationship. Instead of the researcher (advanced practice nurse) lecturing "drinkers," the session was built on exploring concerns about drinking and consequences from participant's perspective. As previously reported, the establishment of a therapeutic relationship inherently increases the likelihood for positive change. The principles mandated that participants were treated as individuals with his or her own needs, history and perceptions. Fourth, that the motivational interviewing program was effective in enhancing participants overall self-efficacy regarding their ability to make positive changes in drinking.

As reported by Bandura (1986), without the development of self-efficacy, hazardous drinkers chance of successfully addressing their drinking is substantially reduced. Therefore, alcohol treatment programs that do not attempt to enhance self-efficacy are inherently less likely to demonstrate positive changes.
Limitations of the Study and Need for Future Research

There were a number of limitations in the current study. First, as in earlier motivational interviewing outcome studies, the number of hazardous drinkers participating in the study, was relatively small. A larger sample of hazardous drinkers would increase the overall power of the study to better demonstrate relationships between variables and overall treatment effects. Error variances between groups would be more equally dispersed and the statistical assumptions with the ANOVA designs would be more easily met. In general, a larger sampling of hazardous drinkers would not only lower the risk of making Type I errors, but would also reduce the likelihood of making a Type II error. In addition, the small number of hazardous drinkers who participated in the study may have led to fortuitous conclusions (Type II error) in the between group analysis.

A second limitation relates to the sampling of participants. A majority of study participants were from one clinic. Of the 28 participants who started the study, and the 5 clinics used as recruitment sites, 23 participants came from the largest clinic. One clinic had no participants, and the remaining clinics had from 1 to 2 participants. The reasons for this may be multiple and complex. The predominant cultural religion may have restricted some clinic clients from even completing a screening tool (AUDIT), despite the assurances of anonymity. Two clinics have predominantly Hispanic staff and clients, and limited anonymity in the small towns of several hundred residents. Many of the clients and staff attend religious and community occasions together and are “related” to each other. Although there are no restrictions within Hispanic culture about drinking, the disapproval of the staff may have been problematic for some potential participants. Two
other clinics were located in predominantly Church of Jesus Christ of Latter-Day Saint (LDS) communities of several hundred people. Many of the clients and staff attend religious and community occasions together and are also "related" to each other. Since the LDS church discourages use of alcohol and many of the clinic clients and all of the staff attend this church, the disapproval of the staff may have been problematic for some potential participants. Additionally, since the majority of participants came from the clinic in the largest demographic area, the study population may have had higher level of psychiatric disorders. This clinic serves a high number of clients with psychiatric problems.

Researcher bias may have been a limitation of the study. Since there was only one researcher performing motivational interviewing interventions, precautions were used to prevent researcher bias. Randomization using a random numbers table was used to prevent selection bias. Since the researcher practices at all five clinic sites, clients of the researcher were eliminated (22 clients of the researcher completed the AUDIT) from the study. Results of the GGT test were not placed in client charts to prevent the providers of the clients from intervening during the study. Future studies should utilize more therapists and could include teaching motivation interviewing techniques to health care providers such as nurse practitioners and physicians.

A final limitation relates to the generalizability, or external validity, of the findings. It is unknown to what degree the current sample of hazardous drinkers represent hazardous drinkers in general. The current study may be restricted in generalizing these findings beyond low-income clinic clients. Future research is needed to extend these findings to other samples and locations. Hazardous drinking is a widespread problem, and
low numbers of hazardous drinkers seeking medical care are being identified. There is consensus among the American Medical Association and other professional groups that clinicians should be alert for signs and symptoms of alcohol abuse and screen with standardized instruments (Williams & Wilkens, 1996).

Future research should include hazardous drinkers who volunteer to participate as well as those court-ordered to attend treatment for drinking. Community members could be recruited through organizations, churches, or referrals from mental and health care professionals. These individuals may not seek care through a primary care setting, as the participants in this study did. By reducing the stigma of treatment, and increasing access, more individuals may be helped. By investigating the effects of motivational interviewing on different groups of hazardous drinkers, the ability to generalize findings to different populations would be enhanced. Moreover, it would be interesting to test for differences between hazardous drinkers who have been court-ordered to attend a motivational interviewing program versus those who attend voluntarily. Another subgroup of hazardous drinkers that merits study includes those who have been injured as a result of drinking, such as in emergency department settings. Recent research on over 200,000 persons age 12 and over showed that 19.7% of all the alcohol consumed in the US is among underage drinkers (age 12-20) (Foster, Vaughn, Califano, 2003; Hanson, 2003). This indicates that this population could benefit from screening and intervention, to prevent progression of drinking to dependence.
Importance for Nursing

Negotiating change in behavior is part of the practice of nurse practitioners. People struggling with alcohol use are more likely to encounter nurse practitioners, family doctors or social workers than counselors specializing in alcohol treatment. Since nurse practitioners offer a wide array of preventive and other medical services, they are well-situated to provide comprehensive continuous care to hazardous drinkers (Fiellin, Reid, & O’Conner, 2000). Alcohol problems have chronic and relapsing characteristics; therefore ongoing followup is important for both starting treatment and supporting client’s efforts to change drinking behaviors. Relapse prevention may be a major aspect of nurse practitioners caring for hazardous drinkers. For example, since nurse practitioners both identify and manage comorbid medical, psychiatric and social problems of clients, treatment of comorbid depression may have a positive effect on alcohol use (Fiellin et al., 2000). Frequently nurse practitioners may have access to family members who can help confirm diagnosis and help in developing a treatment plan. Collaboration with other health care professionals is another aspect of nurse practitioner practice, and may be an important aspect of care.

One rationale for use of motivational interviewing interventions by nurse practitioners is that they have a relationship over time with clients, and second, that a brief motivational nudge may be enough to help clients change (Miller & Rollnick, 1991). Furthermore, the majority of clients do not come forward asking for help, and are either precontemplators or contemplators. Motivational interviewing is specifically designed for preparing people for change. Since most people resist being told what to do “you have to stop drinking,” use of motivational interviewing principles can decrease
resistance and optimize change. Additionally, identifying and intervening with hazardous drinking in a primary care setting can reduce health care costs and reduce the stigma of specialist care. Adding this valuable communication skill to the competencies of nurse practitioners is important to both clients and nurse practitioners.

In summary, future research testing the effects of motivational interviewing on hazardous drinkers should recruit larger samples of participants. Studies should test the effects of motivational interviewing principles and techniques in both community-based and medical setting programs. Motivational interviewing should be tested against structured programs such as outpatient treatment which use empirical measures. The actual techniques employed in motivational interviewing should be further delineated and tested to demonstrate the actual effects of the techniques versus the effects brought about by individual attention or environmental effects. Miller and Rollnick (2002) recommend studies testing the internal validity of motivational interviewing interventions, such as the nature and adequacy of control groups, integrity of the treatment, and reduction of the sources of bias. Previous comparison studies have shown researcher bias toward motivational interviewing interventions. Use of motivational interviewing in other behavioral areas should also be tested. Finally, because hazardous drinking is a long-term problem, there remains a real need for longer follow-up studies.

Summary of Current Investigation

The results of the current investigation found that motivational interviewing shows promise as an effective intervention for hazardous drinkers attending low-income community clinics. Although other possible explanations could be postulated for the
positive changes in sample participants, the data indicate that the motivational interviewing approach was responsible for a significant portion of the positive changes within the current sample. The information collected from the study adds to the literature on hazardous drinking, research, and treatment of this significant problem. There is a vast spectrum of research still needed in this field. It is not only the hazardous drinkers who benefit from effective programs to treat drinking, but also society in general through reduced burden of the great costs related to drinking problems.
APPENDIX A

ALCOHOL USE DISORDERS INVENTORY (AUDIT)

WORLD HEALTH ORGANIZATION
AUDIT

Please circle the answer that is correct for you

1. How often do you have a drink containing alcohol?

<table>
<thead>
<tr>
<th>Never</th>
<th>Monthly or less</th>
<th>Two to four times a month</th>
<th>Two to three times per week</th>
<th>Four or more times a week</th>
</tr>
</thead>
</table>

2. How many drinks containing alcohol do you have on a typical day when you are drinking?

<table>
<thead>
<tr>
<th>1 or 2</th>
<th>3 or 4</th>
<th>5 or 6</th>
<th>7 to 9</th>
<th>10 or more</th>
</tr>
</thead>
</table>

3. How often do you have six or more drinks on one occasion?

<table>
<thead>
<tr>
<th>Never</th>
<th>Less than monthly</th>
<th>Monthly</th>
<th>Two to three times per week</th>
<th>Four or more times a week</th>
</tr>
</thead>
</table>

4. How often during the last year have you found that you were not able to stop drinking once you had started?

<table>
<thead>
<tr>
<th>Never</th>
<th>Less than monthly</th>
<th>Monthly</th>
<th>Two to three times per week</th>
<th>Four or more times a week</th>
</tr>
</thead>
</table>

5. How often during the last year have you failed to do what was normally expected from you because of drinking?

<table>
<thead>
<tr>
<th>Never</th>
<th>Less than monthly</th>
<th>Monthly</th>
<th>Two to three times per week</th>
<th>Four or more times a week</th>
</tr>
</thead>
</table>

6. How often during the last year have you needed a first drink in the morning to get yourself going after a heavy drinking session?

| Never | Less than monthly | Monthly | Two to three times per week | Four or more times a week |
7. How often during the last year have you had a feeling of guilt or remorse after drinking?

<table>
<thead>
<tr>
<th>Never</th>
<th>Less than monthly</th>
<th>Monthly</th>
<th>Two to three times per week</th>
<th>Four or more times a week</th>
</tr>
</thead>
</table>

8. How often during the last year have you been unable to remember what happened the night before because you had been drinking?

<table>
<thead>
<tr>
<th>Never</th>
<th>Less than monthly</th>
<th>Monthly</th>
<th>Two to three times per week</th>
<th>Four or more times a week</th>
</tr>
</thead>
</table>

9. Have you or someone else been injured as a result of your drinking?

<table>
<thead>
<tr>
<th>No</th>
<th>Yes, but not in the last year</th>
<th>Yes, during the last year</th>
</tr>
</thead>
</table>

10. Has a relative or friend, or a doctor or other health worker been concerned about your drinking or suggested you cut down?

<table>
<thead>
<tr>
<th>No</th>
<th>Yes, but not in the last year</th>
<th>Yes, during the last year</th>
</tr>
</thead>
</table>
Procedure for Scoring AUDIT

Questions 1-8 are scored 0, 1, 2, 3 or 4.
Questions 9 and 10 are scored 0, 2 or 4 only.
The response is as follows:

<table>
<thead>
<tr>
<th></th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Question 1</td>
<td>Never</td>
<td>Monthly or less</td>
<td>Two to four times per month</td>
<td>Two to three times per week</td>
<td>Four or more times per week</td>
</tr>
<tr>
<td>Question 2</td>
<td>1 or 2</td>
<td>3 or 4</td>
<td>5 or 6</td>
<td>7 to 9</td>
<td>10 or more</td>
</tr>
<tr>
<td>Question 3-8</td>
<td>Never</td>
<td>Less than monthly</td>
<td>Monthly</td>
<td>Weekly</td>
<td>Daily or almost daily</td>
</tr>
<tr>
<td>Questions 9-10</td>
<td>No</td>
<td>Yes, but not in the last year</td>
<td>Yes, during the last year</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The minimum score (for non drinkers) is 0 and the maximum possible score is 40.
A score of 8 or more indicates a strong likelihood of hazardous or harmful alcohol consumption.
APPENDIX B

SIX-WEEK ALCOHOL QUANTITY/FREQUENCY FORM
### Six-Week Alcohol Quantity/Frequency Form

<table>
<thead>
<tr>
<th>Date</th>
<th>Number of drinks by beverage type</th>
<th>Tot.</th>
<th>Date</th>
<th>Number of drinks by beverage type</th>
<th>Tot.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Beer</strong></td>
<td><strong>Hard Liquor</strong></td>
<td><strong>Wine</strong></td>
<td><strong>Beer</strong></td>
<td><strong>Hard Liquor</strong></td>
</tr>
<tr>
<td>Mon</td>
<td></td>
<td></td>
<td></td>
<td>Mon</td>
<td></td>
</tr>
<tr>
<td>Tues</td>
<td></td>
<td></td>
<td></td>
<td>Tues</td>
<td></td>
</tr>
<tr>
<td>Wed</td>
<td></td>
<td></td>
<td></td>
<td>Wed</td>
<td></td>
</tr>
<tr>
<td>Thur</td>
<td></td>
<td></td>
<td></td>
<td>Thur</td>
<td></td>
</tr>
<tr>
<td>Fri</td>
<td></td>
<td></td>
<td></td>
<td>Fri</td>
<td></td>
</tr>
<tr>
<td>Sat</td>
<td></td>
<td></td>
<td></td>
<td>Sat</td>
<td></td>
</tr>
<tr>
<td>Sun</td>
<td></td>
<td></td>
<td></td>
<td>Sun</td>
<td></td>
</tr>
<tr>
<td>Mon</td>
<td></td>
<td></td>
<td></td>
<td>Mon</td>
<td></td>
</tr>
<tr>
<td>Tues</td>
<td></td>
<td></td>
<td></td>
<td>Tues</td>
<td></td>
</tr>
<tr>
<td>Wed</td>
<td></td>
<td></td>
<td></td>
<td>Wed</td>
<td></td>
</tr>
<tr>
<td>Thur</td>
<td></td>
<td></td>
<td></td>
<td>Thur</td>
<td></td>
</tr>
<tr>
<td>Fri</td>
<td></td>
<td></td>
<td></td>
<td>Fri</td>
<td></td>
</tr>
<tr>
<td>Sat</td>
<td></td>
<td></td>
<td></td>
<td>Sat</td>
<td></td>
</tr>
<tr>
<td>Sun</td>
<td></td>
<td></td>
<td></td>
<td>Sun</td>
<td></td>
</tr>
</tbody>
</table>

Average number of drinks per day: Average number of drinks per week:
<table>
<thead>
<tr>
<th>Intake Demographic Form Visit One (pre-test)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Date</strong></td>
</tr>
<tr>
<td><strong>ID number</strong></td>
</tr>
<tr>
<td><strong>Age</strong></td>
</tr>
<tr>
<td><strong>Gender</strong></td>
</tr>
<tr>
<td><strong>Educational Level</strong></td>
</tr>
<tr>
<td><strong>Psychiatric Diagnosis</strong></td>
</tr>
<tr>
<td><strong>Race</strong></td>
</tr>
<tr>
<td><strong>Living arrangements</strong></td>
</tr>
<tr>
<td><strong>Legal problems</strong></td>
</tr>
<tr>
<td><strong>Symptoms of alcohol withdrawal</strong></td>
</tr>
<tr>
<td>(past 6 weeks)</td>
</tr>
<tr>
<td><strong>Use of self-help meetings</strong></td>
</tr>
<tr>
<td>(past 6 weeks)</td>
</tr>
<tr>
<td><strong>Medications</strong></td>
</tr>
<tr>
<td><strong>Health professional contact</strong></td>
</tr>
<tr>
<td>(past 6 weeks)</td>
</tr>
<tr>
<td>Intake Demographic Form Visit Two (post-test)</td>
</tr>
<tr>
<td>---------------------------------------------</td>
</tr>
<tr>
<td>Date</td>
</tr>
<tr>
<td>ID number</td>
</tr>
<tr>
<td>Living arrangement change Yes No</td>
</tr>
<tr>
<td>Legal problems (past 6 weeks) Yes No</td>
</tr>
<tr>
<td>Symptoms of alcohol withdrawal (past 6 weeks) Yes No</td>
</tr>
<tr>
<td>Use of self-help meetings (past 6 weeks) Yes No</td>
</tr>
<tr>
<td>Medications (new in past 6 weeks)</td>
</tr>
<tr>
<td>Health professional contact (past 6 weeks) Yes No</td>
</tr>
</tbody>
</table>
APPENDIX C

INFORMED CONSENT
**Motivational Interviewing With Hazardous Drinkers**

Nancy Beckham, Principal Investigator

Page 1 of 2

Consent Form

**Background:** You are invited to participate in a study designed to help hazardous alcohol drinkers in a primary care setting. The purpose of the study is to determine the usefulness of a motivational interviewing session with hazardous drinkers.

**Study procedures:** To determine if this program is successful, I need volunteers to serve as program participants or control subjects in this study. After you agree to participate in the study, you will be randomly assigned to either the treatment program or the control group. There are two visits over a six-week period. **Visit One:** You will be asked questions about your drinking over the past three months. A GGT blood test will be drawn to measure liver enzymes that may be affected by drinking. Visit One will take about one hour and you will be paid $5. **Visit Two (6 weeks after first visit):** A GGT blood test will be drawn to measure liver enzymes, and you will be asked questions about your drinking over the past 6 weeks. Visit two will take about 1 hour and you will be paid $5. The treatment group participants receive one session of motivational interviewing during visit one. An example of a motivational interviewing session includes discussion about use of alcohol, and discussing changes you may want to make in your drinking. The researcher will guide the session and help you set goals for change if desired. The control group participants do not receive the motivational interviewing session.

**Risks:** The risks to you for participating in this study include brief pain from the needlestick and anxiety during the questionnaire and motivational interviewing session if you are in the treatment group.

**Benefits:** Subjects in this study may benefit from feedback about your drinking behavior. It is hoped that information from this study will help hazardous drinkers and their care providers.

**Alternative procedures:** Your may choose not to participate in this study. If you choose not to participate, it will not affect your relationship with the care providers or clinic.

**Confidentiality:** All information by you will be kept strictly confidential. Although a number will be assigned to your set of questionnaires so that I can match your responses throughout the study, the list that links names with identification will be kept in a locked file box in my office. Although the results of this study may be published or presented at research presentations, no information that can identify individual participants will be presented.

**Person to contact:** If you have questions about this study, please feel free to contact Nancy Beckham at (208) 221-4843 (24 hour number).
Institutional Review Board: If you have questions regarding your rights as a research subject, or if problems arise which you do not feel you can discuss with the Investigator, please contact the Institutional Review Board Office at (801) 581-3655.

Medical treatment or compensation for injury: In the event you sustain injury resulting from your participation in the research project, the University of Utah can provide to you, without charge, emergency and temporary medical treatment not otherwise covered by your own insurance. If you believe that you have sustained an injury as a result of your participation in this research program, please contact the Institutional Review Board, phone number (801) 581-3655. By signing this document you are not giving up your right to pursue legal action against any and all parties involved with this research, in accordance with the Utah Governmental Immunity Act, Section 63-30-1:63-30-34 Utah Code Ann. 1953 (as amended).”

Voluntary participation: Your participating in this study is voluntary. You may withdraw from this study at any time without affecting your care.

Unforeseeable risks: The treatment may involve risks to the subject that are currently unforeseeable.

Right of investigator to withdraw subjects: Subjects may be terminated from the study for missing one session.

Costs to subjects: The only costs to subjects will be transportation to and from the clinic, loss of time while attending the sessions, and the time it takes to complete the study questionnaires.

New information: Significant findings discovered during the course of the research which may relate to the subjects’ health will be provided to the subject at their completion of the study.

Number of subjects: It is anticipated that there will be approximately 100 subjects in the study.

Consent: I have read and understand the above information and I have received a copy of this consent form. I desire to participate in this study and give Nancy Beckham permission to use the information gathered in this study.

Signature of Research Participant                                      Date

Signature of Witness                                                  Date
APPENDIX D

COVER LETTER AUDIT
Dear Health West Client,

You are invited to participate in a study designed to help hazardous alcohol drinkers in a primary care setting. The purpose of the study is to determine the usefulness of a motivational interviewing counseling session with hazardous drinkers. Since there are few low cost treatment programs for persons desiring to change their drinking patterns in Southeast Idaho, research is needed about ways to assist these persons.

The attached questionnaire is an eight-question form asking questions about drinking. It takes about two minutes to complete. Please return the questionnaire in the envelope provided. Your responses and participation in this study are anonymous, no one will know who did or did not participate.

If you would be interested in participating in a study about drinking, please write your name, phone number and address on the bottom of the form. If your scores meet the criteria for this study I will contact you by phone or mail.

Thank you so much for your participation in this research. This work would not be possible without your help.

Sincerely,

Nancy Beckham
APPENDIX E

WHERE DOES YOUR DRINKING FIT IN?

FEEDBACK TOOLS
Where Does Your Drinking Fit In? : AUDIT Score
(Sobell et al., 1996)

AUDIT SCORE
The AUDIT questionnaire was developed by the World Health Organization to evaluate a person’s use of alcohol. Your AUDIT score shows whether your drinking should be considered a problem. Higher scores typically reflect more serious problems.

ALCOHOL-RELATED CONSEQUENCES
The various alcohol-related consequences you reported are checked below. When people stop or reduce heavy drinking these consequences will often decrease or disappear.

<table>
<thead>
<tr>
<th>Your Consequences When Drinking:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical health problems</td>
<td>Verbally abusive or physically aggressive</td>
</tr>
<tr>
<td>Blackouts or memory problems</td>
<td>Work/educational problems</td>
</tr>
<tr>
<td>Emotional problems</td>
<td>Legal problems</td>
</tr>
<tr>
<td>Relationship problems</td>
<td>Financial problems</td>
</tr>
</tbody>
</table>

Where do you fit in?
Your AUDIT score is:

<table>
<thead>
<tr>
<th>Score Range</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very High (26-40)</td>
<td></td>
</tr>
<tr>
<td>High (17-25)</td>
<td></td>
</tr>
<tr>
<td>Medium (8-16)</td>
<td></td>
</tr>
<tr>
<td>Low (1-7)</td>
<td></td>
</tr>
<tr>
<td>No Problem (0)</td>
<td></td>
</tr>
</tbody>
</table>
Where Does Your Drinking Fit In?

HEALTH RISKS
Does your current drinking place you at risk for health problems?

Heart and Stroke disease for men and women

Liver cirrhosis for men

All cancers for men

Breast cancer for women

Your average is:
_____ drinks/week
Where Does Your Drinking Fit In?

Personalized Feedback Summary Prepared for: ________________

Weekly Alcohol Consumption
The average number of drinks you reported consuming per week in the past six weeks was _____ drinks. You can use the following graph to see how much you drink as compared to other Americans.

Women

![Graph showing alcohol consumption among women with categories 17 drinks: 6%, 7-16 drinks: 7%, 1-6 drinks: 46%, 0 drinks: 41%]

Your Average is: _____ Drinks/Week
Where Does Your Drinking Fit In?

Weekly Alcohol Consumption

Your Average is: _____ Drinks/Week The average number of drinks you reported consuming per week in the past six weeks was _____ drinks. You can use the following graph to see how much you drink as compared to other Americans.

**Men**

- 37+ drinks: 7%
- 25-36 drinks: 5%
- 17-24 drinks: 7%
- 7-16 drinks: 13%
- 1-6 drinks: 39%
- 0 drinks: 28%

Your Average is: _____ Drinks/Week
APPENDIX F

ADVICE FOR A REDUCED DRINKING GOAL
Advice for a Reduced Drinking Goal

Recommended guidelines:

- **Males**: 3 X 4 rule: consume no more than 3 standard drinks on any given day and on no more than 4 days per week. 12 total drinks per week. These limits are based on several studies.

- **Females**: 2-3 X 4 rule: consume no more than 2-3 standard drinks on any given day and on no more than 4 days per week. 8-12 total drinks per week. These limits are based on several studies.

- The reason for no drinking daily is that it is important to have abstinent days each week.
- By avoiding daily drinking the habitual components (drinking a certain amount every day at a certain time) are minimized.
- Abstinent days help avoid developing excessive tolerance to alcohol (tolerance reverses somewhat in the absence of drinking)
- Data from a recent survey shows that the strongest predictor for drinking problems is frequency of heavy drinking.
- Do not drink in high risk circumstances – if there is a risk of negative outcome.
- Drink at a rate of no faster than one drink per hour.
- Stop and think procedure – Impose a thinking period of 20 minutes between deciding to have a drink and acting on that decision. Such a procedure helps to counteract impulsive drinking, and gives a person time to reevaluate the reasons for drinking and perhaps decide not to drink.

Your drinking may pose a health risk if you:

- Drink every day
- Drink more than 8-12 (females) to 12 (males) standard* drinks per day
- Drink more than 2-3 (females) to 3 (males) drinks a day
- Drink and drive
- Drink when boating, hunting, or using power tools
- Drink during pregnancy
- Drink and take medications that interact with alcohol
- Drink until the effects are obvious
- Have a medical condition which could be affected by alcohol (high blood pressure, diabetes, ulcers)

*Standard drink is equal to:
12 oz. of regular beer (4% alcohol) = 4 oz glass of wine =
1oz hard liquor (86-90 proof alcohol)
APPENDIX G

ASSESSMENT FOR IMPORTANCE, READINESS AND CONFIDENCE
### Importance

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
</table>

- Important
- Not Important

### Readiness

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
</table>

- Not Ready
- Ready

### Confidence

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
</table>

- Not Confident
- Very Confident
REFERENCES


Sobell, L., Toneatto, T., & Sobell, M. (1994). Behavioral assessment and


