SAFETY BEHAVIORS OF MONTANA LICENSED OUTFITTERS

by

Linda Sue Sobeck

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Wade Hill, PhD, APRN, BC
Committee Chair

Approved for the College of Nursing

Elizabeth Nichols, DNS, RN, FAAN

Approved for the Division of Graduate Education

Joseph J. Fedock, PhD

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DEDICATION

I dedicate this paper to the outfitters and guides in Montana. Their support and participation in this project, along with their professionalism and honor, deserve the respect the outdoor community has given them.

I also dedicate this paper to Christopher Marth, whose support during challenges helped me to succeed, and to our son, Sacha, whose birth in the midst of this project was a precious gift.

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ABSTRACT

INTRODUCTION: Outdoor recreation in remote wilderness areas is becoming popular, with nearly one-quarter of all Americans taking an outdoor adventure vacation in 2004. Along with an increase in recreation, injuries related to outdoor recreation are on the rise, earning a priority on the Center for Disease Control Injury Research Agenda. BACKGROUND: In Montana, outdoor recreation frequently occurs in the wilderness and involves facilitation by licensed outfitters. Basic first aid is required of all licensed outfitters in Montana, though little is known about the actual safety behaviors of outfitters. PURPOSE: This study set out to explore factors that influence the safety behaviors of Montana licensed outfitters, specifically the association between safety behaviors and both remoteness and health beliefs. THEORETICAL CONTEXT: The Health Belief Model (HBM) was used as the contextual theory to understand how attitudes and beliefs interact to explain health behavior. The constructs of the HBM are perceived susceptibility, perceived seriousness, benefits, barriers and cues to action. METHODS: All 640 licensed outfitters in Montana were sent a questionnaire that assessed safety behaviors (actions taken prior to a trip, information provided, and items taken on a trip), remoteness and constructs of the HBM; a total of 248 questionnaires were included in the final analysis. RESULTS: The study found a moderate positive relationship between remoteness and the safety behaviors of actions taken prior to a trip (*rho* = .25, $p<0.01$), information provided (*rho* = .16, $p<0.01$), and items taken on a trip (*rho* = .17, $p<0.01$). This study also found a moderate positive relationship between cues to action and all safety behaviors of actions taken prior to a trip (*rho* = .18, $p<0.01$), information provided (*rho* = .31, $p<0.01$), and items taken on a trip (*rho* = .22, $p<0.01$). DISCUSSION: In Montana outfitters, high levels of safety behaviors were associated with greater distance between hunting or fishing sites to nearest emergency rooms, and cues to action. This suggests that past experience and possible risk of prolonged treatment time plays a part in preparation. Basic first aid may not be an appropriate choice for licensed outfitters, as the course traditionally does not focus on prevention, but rather focuses on early activation of emergency medical services and short-term treatment until medical help arrives. CONCLUSION: Using the information gathered from this study, a tailored message and tailored first aid course might better suit the needs of licensed outfitters in Montana. Rural Nurse Practitioners can take the lead in ensuring individual safety needs are met of clients heading to the wilderness, by facilitating wilderness-oriented first aid to licensed outfitters in Montana, by facilitating community education efforts and by advocating for policy and legislative change, if needed, to keep outfitters and outdoor enthusiasts safe.

CHAPTER ONE

INTRODUCTION

Unintentional injury was the leading cause of death among young adults and children in the United States between 1996 and 1998 (Department of Health and Human Services, Center for Disease Control, 2002a). As a result, the Center for Disease Control (CDC) Injury Research Agenda has made safety and injury prevention a priority for research in the United States. The CDC has further identified injuries related to sports, recreation and exercise as a major contributor of unintentional injury, especially those related to falls, head injuries, water submersions and gun use. Encouraging explorations into recreational and sport safety practices is a step toward developing comprehensive injury prevention programs (Department of Health and Human Services, Center for Disease Control, 2002a), as many of the deaths and injuries related to sports and recreation can be prevented by education and legislative measures that support injury prevention measures (Coffman & Kuniansky, 1997; Department of Heath and Human Services, Center for Disease Control, 2002a; Shafi, et al., 1998).

According to the 1996-1998 CDC State Injury Profiles, Montana has the highest rate of death from unintentional falls in the country, the second highest rate of death from traumatic brain related injury, and ranks among the top twelve states for death rates related to unintentional drowning and fire arm related deaths (2002b). The specific etiology of these unintentional injuries are not well understood. However, recreation patterns in Montana point to sports and recreation as being a contributor of unintentional

injury. The National Survey on Recreation and the Environment indicates that camping, hunting, and outdoor adventure activities are more popular in the Rocky Mountain States than anywhere else in the country (The Interagency National Survey Consortium, 2003). It is not surprising, then, that deaths related to unintentional injuries echo the major outdoor activities and events occurring in the Montana wilderness (Department of Health and Human Services, Center for Disease Control, 2002b).

In Montana, most wilderness recreation inherently occurs in remote areas and travel to the nearest medical treatment facility could be hours away. Though illness may not be a direct result of being in the wilderness, per se, it is no less serious an event when an acute illness arises in remote settings. Distance is not the only factor that determines remoteness and the time it takes to treat an ill or injured person. The nature of remoteness also includes isolation and inaccessibility. These factors, specifically, separate wilderness illness and injury from all other types of sports and recreation injury.

Injury and illness in wilderness areas are compounded in a rural state like Montana. Transportation or search and rescue to and from a remote site will inherently delay the time to treatment in rural areas (Grossman et al., 1997; Espsosito et al., 1995; Gentile, 1992), and any delay in the time to treatment can impact injury outcome (Birk & Henriksen, 2002; Esposito et al., 1995). Further, the time spent by emergency transportation or medical services on stabilizing or treating the ill or injured (on-scene treatment time) can have a large bearing on the outcome of an illness or injury (Birk & Henriksen, 2002). In urban areas, an increase in on-scene time could be the result of pre-hospital providers with experienced advanced life support skills taking the time to assess, triage and treat at the scene prior to transporting (Birk & Henriksen, 2002). In Montana,

however, emergency medical services are most often provided by trained and certified EMT volunteers. Rural volunteers get little exposure to managing acute illness and trauma when compared to urban pre-hospital providers, which may lead to more time and thought to perform on-scene treatment (Pullum, Sanddal & Obbink, 1999). The over-all delay in treatment at a hospital emergency room is the main concern when an injury or acute illness occurs in a rural area, and when the injury or illness occurs in a remote wilderness setting, the consequences could be dire.

Adventure and wilderness recreation frequently involves facilitation by outfitters as leaders of outdoor expeditions. Professional outfitters in Montana are licensed by the state. They are true experts in outdoor recreation and are involved in all aspects of hunting and fishing, which can include backpacking, hiking, camping, horseback riding, and boating. Montana professional outfitters are not required, however, to be experts in outdoor safety and the management of wilderness injury and illness. Montana outfitters' perceptions about wilderness illness and injury are not well understood, and little is known about the safety precautions that Montana professional outfitters take to ensure their client's safety. The purpose of this study is to explore the factors that influence the safety behaviors of Montana professional outfitters.

Background

The Montana Professional and Occupational Licensing Division charges the State of Montana Board of Outfitters with responsibility for licensure of outfitters and guides. Becoming a licensed outfitter in Montana is a two-step process. The first step is to obtain licensure as a guide. Guides must hold basic first aid certification, have a month of

experience as a fisherman or hunter prior to obtaining licensure, and must be employed by an outfitter to get insurance coverage. Guides are not allowed to advertise for their services (State of Montana, 2003a).

In Montana, outfitters are required to have at least one hundred days of experience as a licensed hunting or fishing guide, and the State of Montana Board of Outfitters requires an extensive equipment and premises inspection to obtain and maintain licensure (State of Montana, 2003b). Outfitters must also pass at least one exam that assesses their general knowledge of ecology, hunting and fishing issues, as well as safety to become licensed as General Outfitters. Montana professional outfitters can also choose to take additional exams to become specifically licensed in hunting, fishing and livestock services. A hunting outfitter license requires advanced knowledge of firearms and safety, as well as game and hunting. A fishing license requires advanced knowledge of stream access and river ecology along with water and boating safety. A livestock license is required for professional outfitters who wish to maintain their own stock of horses, mules, llama, etc., for expedition. This requires advanced knowledge of horsemanship and livestock care. Regardless of the type of licensure all licensed outfitters are required to maintain basic first aid certification (State of Montana, 2003b).

Although their job description, licensure and required level of first aid certification do not suggest accountability for emergent medical issues in the wilderness, outfitters are the first contact for the injured individuals in their charge, and because outfitters are the licensed professionals responsible for leading an outing they may also be, by default, responsible for any injuries or illness that clients incur during their trip (Grant, Thompson, & Boyes, 1996). Therefore, outfitters are in a unique position to play

an important role in injury prevention and management. Approaching outfitters as important providers of healthcare in the wilderness, we have the ability to influence outcomes by acting most proximally to where injuries and illness occur.

Theoretical Context: Health Belief Model

The Health Belief Model has been used as a way of understanding the perceptions that prompt an individual to participate in disease prevention activities or maintain health. Developed in the 1950's by a group of investigators working in the Public Health Service, the Health Belief Model (HBM) grew out of a need to understand why some individuals did not act on disease prevention and screening tests for TB (Rosenstock, 1974). The originators of the HBM, Godfrey Hochbaum, PhD, Stephen Kegels, PhD and Irwin Rosenstock, PhD were trained social psychologist working for the Public Health Service. Together, they put the theories of social psychology to use in the field of health behavior. Using large studies to determine the factors of health perception, and the resulting behavior, Hochbaum, Kegels and Rosenbaum developed the Health Belief Model. Put simply, their theory maintains that motivation to seek health screenings and act on disease prevention measures is a dynamic process between an individuals current beliefs about an illness, the perceived risk of an illness, cost of treatment or screening, and the perceived benefit of treatment or screening. From the initial investigations into TB screenings, the HBM was honed to explain for behavior regarding other disease states including cervical cancer, dental disease and polio (Rosenstock, 1974).

The general purpose of the HMB, as identified by the researchers, is to explain health behavior (Rosenstock, 1974). This clear, broad purpose seems to be a factor in the

popularity of the HMB in health behavior research. In exploring its development, however, the HMB was originally designed to describe factors involved in decision making regarding health screening or disease prevention, and did not consider true health promotion activities. The HMB has since been expanded to include existing health problems and interventions (Janz, Champion, &Strecher, 2002; Finfgeld, Wongvatunyu, Conn, Grando, & Russel, 2003).

Broad constructs used in the HMB are labeled as beliefs. These beliefs include the perceived susceptibility to a disease, perceived seriousness of a disease, perceived threat of a disease, perceived benefits of preventative action, perceived barriers to preventive action. Cues to action are also included as modifiers that prompt health behavior. The HMB describes these health beliefs and modifiers as detached constructs that are inter-related in shaping an individual's health behaviors (Janz, et al., 2002).

Perceived susceptibility (Susceptibility) is the subjective possibility of contracting a disease. Perceived seriousness (Seriousness*)* is the subjective threat of a disease, or the impact that disease could have. Perceived benefits of taking action (Benefits) is the subjective understanding of relative effectiveness of treatment. Barriers to taking action (Barriers) is the subjective understanding of the negative aspects of seeking treatment that prevent seeking treatment. Cues to action (Cues) are the subjective triggers that stimulate taking action or seeking treatment.

Each concept of the HBM is considered interactive, though distinct. The model begins with individual perceptions, as determined by the perceived susceptibility and seriousness of a disease. Individual perceptions affect the modifying factors of perceived threat of a disease and cues to action. Modifying factors also include demographic

variables, sociological variables (e.g. personality traits and social class), and structural variables, such as knowledge about the disease and prior experience with a disease. The modifying factors then impact the perceived benefits of preventive action, tempered by the perceived barriers to action. Reactively all of these factors will ultimately determine the likelihood of taking action, whether that action is health screening (e.g., mammography) or injury prevention measures (e.g., seat-belt use, bicycle helmet use or use of in-line skating protective gear) (Rosenstock, 1974; Janz, et al., 2002; Trifiletti, Gielen, Sleet, & Hopkins, 2005).

Research Questions

The research questions to be addressed by this study are as follows:

1. How does remoteness relate to safety behaviors of Montana outfitters?
2. How do the Health Belief Model constructs of susceptibility, seriousness, benefits, barriers and cues relate to Montana outfitters safety behaviors and perception of preparedness?

The research hypotheses for this study are as follows:

1. Remoteness will be positively related to safety behaviors.
2. Health Belief Model constructs of seriousness, susceptibility, cues and benefits will be positively related to safety behaviors; barriers will be negatively related to safety behaviors.

CHAPTER TWO

REVIEW OF LITERATURE

Wilderness Injuries and Illness

Examining all the factors that influence wilderness injury and illness prove to be a challenge. Occurring in remote settings, often due to trauma or exposure, wilderness injuries and illness are unique. Personal health beliefs will influence how much first aid training is obtained, and how the value of safety measures are perceived in wilderness settings as in urban areas (Walsh, 1995; Oh, et. al., 2004). The obvious factors of first aid training and safety behaviors will certainly impact the likelihood of any injury, especially the ability to manage injury and illness in the wilderness (Marks, 2001). It is the wilderness itself that dictates the two most distinguishing features of wilderness injury and illness; the types of illness and injuries encountered, and the remoteness of the wilderness setting.

The National Electronic Injury Surveillance System – All Injury Program (NEISS-AIP) is a current injury surveillance system that monitors a national sample of hospitals reporting sports and recreational injuries. However, the design of the NEISS-AIP does not provide for state specific information nor does it provide information that would help to monitor or understand specific injuries and illness, such as those occurring in the wilderness (Gerson & Stevens, 2004). Epidemiological studies of wilderness illness and injuries are lacking and tend to be specific to a particular activity and region

(e.g. "Orthopedic injuries related to snowmobile use", Karlstad & Trousdale, 2003; "Hunting-related injuries and deaths in Montana…", Lambrecth & Hargarten, 1993; "A review of horse-related injuries in a rural Colorado hospital…", Newton & Nielsen, 2005) or for a particular illness or injury (e.g. "Altitude-related illness in two California national parks", Weichenthal & Hendey, 1998; "North American wild mammalian injuries", Freer, 2004).

Most injury studies rely on retrospective data from incident reports filed at national parks or emergency department visits abstracted via diagnostic and billing codes. This means that the information only includes injuries and illness occurring to individuals that either reported the incident to a national park employee or sought care for their injury or illness. This also means that the mechanism of injury may not be known (e.g. via a fall or a blow to the arm), nor are the surrounding circumstances, such as who was in attendance or was a licensed outfitter facilitating the experience known. Nonetheless, the available studies do show some general and consistent trends. Musculoskeletal limb injuries are the most commonly reported or treated type of serious injury and gastrointestinal symptoms are the most common illness occurring in the wilderness. Deaths occurring in the wilderness usually result from a cardiac event, drowning or from a fall.

Musculoskeletal Injuries

Conn, Annest & Gilchrist (2003) analyzed sports and recreational injuries in the United States from 1997 to 1999. In this study, the researchers analyzed data obtained by the National Center for Health Statistics' National Health Interview, which collected

information about the four most recent injury episodes that were attended to medically during the three previous months. The details of each episode include the activity prior to the injury, the mechanism of injury, the details of the injury itself, and the required treatment. They found that sprains and strains of the extremities were the most common injuries requiring medical attention, mostly attributed to strikes, falls and overuse injuries.

This trend has been documented in the wilderness via two similar case incident reports by Montalvo, Wingard, Bracker & Davidson (1998) and Stephens, Diekma, & Klein (2005). During 1993 through 1995, in eight National Park Service parks in California, Montalvo, et al.,(1998) retrospectively collected and analyzed any incident occurring to a visitor requiring assistance from a park ranger, or activation of emergency medical services or search and rescue that precipitate a case incident form. Stephens, et al. (2005) collected retrospective data from Mount Rainer National Park and Olympic National Park in Washington State between 1997 and 2001. Incidents included any injury sustained to a visitor during recreational activity requiring assistance from a park ranger, or activation of emergency medical services or search and rescue. As in the sports and recreational data, musculoskeletal injuries were common. The Washington State study (Stephens, et al., 2005) found that strains and sprains were most common, followed by fractures and dislocations. The California study did not have that level of data, as it was not included on the National Park Service incident report forms (Montalvo et al., 1998). Most injuries could be attributed to activities common in parks such as driving, walking, hiking and skiing (winter sports) and water sports (summer activities). While both studies may be capturing injury and illness that occur in remote areas, park rangers,

emergency medical services and search and rescue facilities were available to receive the sick and injured.

A third study, conducted via the National Outdoor Leadership School (NOLS), also points to musculoskeletal injury as a common injury in the wilderness (Leemon & Schimelpfenig, 2003). In part, this prospective study describes the field injuries recorded in the NOLS incident database from 1999 to 2002. An incident in this study, however, was much more inclusive and defined, providing data useful to the NOLS on-going risk-management efforts. The injury incidents for this study included any injury that required more than simple first aid, needed follow-up care or a prescription or resulted in one day of lost time from work or recreation. Sprains and strains were, again, the most common injury, mostly from slips or falls and overuse.

Wilderness rescue teams have provided information about more severe or remote injuries requiring assistance with evacuation. A look at the epidemiology of a New Hampshire Wilderness SAR team (Ela, 2004) also provides information about the types of illness and injury encountered in the wilderness. Citing musculoskeletal injuries as the most common injury, Ela retrospectively reviewed wilderness search and rescue incidents from the New Hampshire Fish and Game Department filed between January 1999 and December 2001. Lost or missing persons accounted for most of the incidents (49.7%), and hiking was the common activity prior to the incident. Musculoskeletal injuries were also most commonly reported in an older study, examining a Reach and Treat team (RAT) at Mt. Hood, Oregon (Schmidt, Federiuk, Zechnich, Forsythe, Christie, & Andrews, 1996). Consistent with other reports, hiking was the most common activity associated with an incident requiring assistance.

Gastrointestinal Illness

Illness occurring in the wilderness is less studied than injuries. In the California study (Montalvo, et al., 1998), diarrhea and hypothermia are the only illnesses reported through the case incidents. Gastrointestinal complaints (e.g. nausea, vomiting and diarrhea) are also listed in the NOLS incident profiles as the leading cause of illness in their wilderness experience (Leemon & Schimelpfenig, 2003).

A common cause of diarrhea or other gastrointestinal complaints is thought to be contaminated water. Welch (2000) conducted a meta-analysis of the literature to explore the risk of consuming water contaminated with giardia, as a factor contributing to the known gastrointestinal complaints of outdoor enthusiasts and hikers (Boulware, Forgey, & Martin, 2003; Gardner & Hill, 2002). Surprisingly, Welch (2000) found little evidence to support contaminated backcountry water as the source of gastrointestinal illness. In a study exploring the role of hygiene, Boulware (2004), found a 45% occurrence of diarrhea among backpackers who utilized a personal water purification system. Further, there was a strong association between post- defecation hand washing with soap and water, routine cleaning of cooking utensils with soap and water and a reduced risk of diarrhea. This important finding indicates the important role of simple personal hygiene in wilderness illness prevention.

Wilderness Mortality

A small number of studies have explored mortality in the wilderness. As in the wilderness injury and illness literature, the studies are specific to a particular activity or region. For example, Tough and Butt (1993) reviewed deaths related to backcountry

skiing in Alberta, Canada between 1980 and 1991. The results were not unforeseen. A small number of deaths (19 total) were attributed to backcountry skiing during those years, and the vast majority died from avalanche-related traumatic asphyxia. The remaining deaths were due to blunt trauma or falls. The number of avalanche related deaths in backcountry areas may be increasing, possibly paralleling the increase in wilderness travelers (Page, Atkins, Shockley, & Yaron, 1999).

The few studies that include wilderness mortality data demonstrate conflicting data, suggesting that mortality is related to the activity and participants as well as to remoteness and wilderness terrain. In the California study previously discussed (Montalvo, et al., 1998), cardiac fatalities were most common, followed by drowning and falls. Age associated with mortalities was not addressed. A review of wilderness mortality in Arizona demonstrated a link between alcohol consumption and mortality, also finding falls resulting in drowning (e.g. a fall over a slippery rock into a river), traumatic falls and drowning the most common causes of death (Goodman, et al., 2003). The New Hampshire wilderness SAR study (Ela, 2004) found that drowning and cardiac events were responsible for the majority of deaths that involved the wilderness SAR team. Fourteen of the rescued subjects died, 32.8% from drowning, 23.4% from cardiac events. Pediatric deaths in all studies were either rare or non-existent.

While the terrain and climate in the California National Parks, the Arizona and New Hampshire wilderness were presumably quite different, the activities offered in all areas could be rugged and risky, including technical rock climbing and white water rafting. Interestingly, the activities leading to mortality were most often the least risky

activities, including hiking and swimming (Montalvo, et al., 1998; Goodman, et al., 2003).

A third study specifically examined pediatric mortality occurring in Washington State wilderness areas (Newman, Diekma, Shubkin, Klein & Quan, 1998). Drowning was the most common cause of death in this pediatric population, followed by closed head injury, usually resulting from a fall. A total of 40 deaths were recorded between 1987 and 1996. Overall, these studies examining morbidity and mortality of wilderness injury and illness point to preventable injuries, illness and deaths.

Remoteness

A logical consequence of injury or illness in a remote setting is that transportation to and from the nearest medical facility takes longer than in urban settings, which has been the crux for medical helicopter services and search and rescue (SAR) teams affiliated with wilderness areas (Cooper, LaValla & Stoffel, 2001; Grissom, Thomas & James, 2006). Esposito, et al (1994) and Waller, Curran and Noyes (1964) documented this relationship by comparing motor-vehicle deaths in urban versus rural areas, finding a death rate in rural areas two to three times that of urban areas. This delay in treatment is postulated to be responsible for at least some of the deaths, and reducing the time to treatment would prevent death.

Remoteness, however, implies more than distance. Remoteness includes isolation and seclusion, and as it occurs in the wilderness, often includes harsh elements and rough terrain. The remoteness of the wilderness creates problematic transport and treatment issues. Schmidt, et al's study (1996) of the RAT team at Mt. Hood Oregon included

descriptors of the terrain and specific techniques required to reach the injured. Helicopters and motorized transport were available to the team, and all team members had experience and education in Advanced Life Support (ALS), wilderness skills and rescue techniques. The terrain was reported as open in only 3% of the incidents, meaning that the remaining incidents involved some obstacle, such as steep (33%), rocky (38%), snowy (46%) or alpine (29%) terrain.

The RAT team rated the accessibility of the terrain from "easy" to "very difficult". Only 25% of the rescue environment was rated as easy, and 41% was rated as difficult or very difficult. The RAT team was often required to hike into the site because of the terrain (60%), and 20% of the rescues required technical rock climbing to reach a victim. The most frequent mode of evacuation was carry-out by liter (44%). This is a labor intensive means of transport requiring several team members to carry an injured person out of the wilderness (Cooper, Messenger & Mier, 2001). Helicopters and snowcats transported 22% of the victims and 13% were assisted to a walk or hike out.

The issue of remoteness is central to wilderness injury and illness, and early management strategies are the most important step toward reducing wilderness injury and illness morbidity (Marks, 2001). Efforts to prevent wilderness injury and illness through safety behaviors become the priority in wilderness medicine research.

Safety in the Wilderness

Regardless of setting, public health research has demonstrated a link between prevention measures and reduction in injuries, illness and deaths (Doll & Binder, 2004; Lett, Kobusingye & Sethi, 2002; Department of Health and Human Services, Center for

Disease Control, 2002a). Now, outdoor recreation is on the rise with one quarter of all Americans taking an adventure or outdoor activity vacation in 2004 (Outdoor Industry Association, 2005), and safety is a concern for all. The demand for wilderness experiences in the United States is increasing and the demand for information about the safety needs of wilderness travelers is increasing as well. Indeed, the inherent nature of wilderness recreation (e.g., remote and sometimes harsh settings) makes wilderness safety and injury prevention paramount before the burden of wilderness injury and illness overwhelm the outdoor recreation industry (Grant, et al., 1996).

Wilderness Safety Research

Preventing illness and injury in the wilderness has been likened to a matrix that can involve many different steps at many different points in time, from preventing the mechanism of injury itself (e.g., sun-block to prevent sun-burn) to minimizing the effect of an injury once it has happened (e.g., ice to reduce and prevent further swelling) (Lett, Kobusingye & Sethi, 2002). The various components of injury prevention can prove to be difficult to study, however, the core of injury prevention efforts are often targeted at safety behaviors. Safety behaviors are the preparation and collective measures that people take to prevent or minimize accidents and injuries, and are essential to injury prevention and safety research.

To date, studies on the safety behaviors of licensed outfitters have not been published. The safety behaviors of outdoor enthusiasts, however, are a good proxy for licensed outfitters, as they participate in essentially the same activities. Though they have no contractual or economic responsibility with clients, the risk for illness and injury is

similar and the need for safety remains a priority. Little is known about safety behaviors of outdoor enthusiasts when recreating in the wilderness, though the available studies demonstrate a tendency for a lack of preparation relative to recommended guidelines.

In an investigation of rock climbers' self-perception of preparation for injury, Attarian (2002) concluded that rock climbers perceived themselves to be safe, taking precautions to prevent or minimize injury when possible. This was based on self-reported level of confidence, reported use of recommended equipment, and level of first aid certification. Almost half of the respondents reported themselves as the highest level of advanced climbers, while a small percentage (4.5 %) considered themselves as novice rock climbers that may not require technical equipment or experience.

Contrary to Attarian's work, three studies have found ill-prepared wilderness hikers and mountaineers (Kogut & Rodewald, 1994; Westfall, Gramling, O'Brien-Gonzales & Barley, 1999, Kuepper, Wermelskirchen, Beeker, Reisten & Waander, 2003). Kogut and Rodewald observed the supplies carried, and surveyed the health care needs and knowledge of wilderness hikers as they set out for a hike in Yosemite National Park. Only half carried the recommended equipment and first aid supplies. About half have taken a basic first aid course in the last year, and most wished to learn more about first aid. Most hikers in this study had substantial knowledge of commonly taught first aid topics; few had knowledge about injuries associated with high morbidity or mortality specific to wilderness illness and injury.

A second study specifically addressing high-altitude wilderness hikers found preparation and appropriate knowledge were lacking. Westfall, Gramling, O'Brien-Gonzales and Barley (1999), surveyed backpackers as they set out for a high-altitude hike

at Longs Peak, Colorado. The researchers came to the similar conclusions as Kogut and Rodewald (1994). A large percentage were not carrying equipment recommended by the Wilderness Medical Society, the benchmark used in this study, including adequate water (89%) or a method of water purification (67%), and a medical kit (50%). The high-altitude backpackers also lacked knowledge about adequate hydration, signs and symptoms of hypothermia, signs and symptoms of altitude sickness and high altitude pulmonary edema (HAPE), all of which are common to high-altitude hiking. Again, this could suggest that wilderness specific information is lacking.

Lastly, Kuepper, Wermelskirchen, Beeker, Reisten and Waanders (2003) evaluated, among other variables, alpine mountaineers' knowledge of 11 first aid themes. The 283 European mountaineers scored low on all themes of first aid (less than 40% providing correct answers), though the scoring system in this study was quite stringent, requiring five correct answers for each theme. The themes included were: cold injuries, shock, altitude, cardiac emergencies, fractures, heat, lightening, snow blindness, cerebral trauma, pain trauma and first aid strategy. The mountaineers scored highest on altitude issues, cardiac emergencies, and shock; lowest on fracture first aid, pain management, and first aid strategy.

To date, one published study has examined wilderness safety in licensed outdoor professional leaders. Hillebrandt (2000) collected data from British mountain guides who professionally guide in the European Alps, which requires training and an extensive apprenticeship. The data gathered information about the most recent five injuries and illnesses encountered by the professional mountain guides in addition to the top five most needed areas of information. The most frequently encountered serious injuries and

illnesses were limb injuries (fractures, strains and dislocations), altitude illness, gastrointestinal illness (diarrhea and vomiting), followed by minor injuries of blisters, then cuts and bruises. The most frequently requested areas of needed information were drug use (specifically mentioned were antibiotics and analgesics), altitude illness, water purification, travel immunization and trauma.

In summary, these few published studies indicate a clear need for more knowledge of wilderness specific safety and preparation among the outdoor enthusiast. The concern here is that these hikers, mountaineers and climbers are experts, and all were embarking on lengthy and technically strenuous tasks, though they were not prepared to handle emergencies unique to their sport or setting. Are Montana's outfitters more prepared than the average outdoor enthusiast? As Americans head to the wilderness for solace and adventure, keeping them safe will become a common goal for professional outfitters, health care providers and legislators.

Health Belief Model

Behavioral theories provide the framework through which we can begin to understand, and therefore hope to change, how people act when given information. The HBM has been used in understanding intrapersonal belief relationships between personal risks versus personal action, and has been applied to sport and recreational related injury prevention in a few settings (Carter & Kulbok, 2002; Janz et al., 2002; Williams-Avery & MacKinnon, 1996). The HBM has also been used specifically as an intrapersonal model to assess parental beliefs about childhood injury (Gilk, Greaves, Kronenfeld & Jackson, 1993;Russell, 1991; Sellstrom, Bremberg, Garling, & Hornquist,

2000). Exploring health beliefs has also been useful in understanding intrapersonal interventions that people take on behalf of others. These examples include first-aid training of the general public as well as teachers and the actions of bystanders at motor vehicle accidents (Pearn, Leditshke, Dawson & Petrie, 1980; Neuharth-Pritchet & Getch, 2001; Larsson, Martensson & Alexanderson, 2003; Walsh, 2000).

To better understand how health beliefs affect injury prevention efforts, Williams-Avery and MacKinnon (1996) surveyed in-line skaters using the HBM to predict the use of protective equipment. Perceived benefits of equipment use, and susceptibility to injury were significantly related to the use of protective gear, whereas perceived barriers (e.g. discomfort, looks of gear) were related to a lack of protective gear. More importantly, the researchers noted that as the frequency of gear use increased, the incidence of injuries decreased.

Lajunen and Räsänen (2004) compared the HBM to other psychosocial theories (e.g. Theory of Planned Behavior and Locus of Control) to understand bicycle helmet use, and found it had some predictive value in determining helmet use. Perceived barriers, again, were related to a lack of bicycle helmet use. Cues to action, in this study, (e.g. helmet is kept in a visible place) were related to more consistent use of helmets. Lajunen and Rasanen (2004) note that the HBM was not a good fit, in general, to explain bicycle helmet use. However, barriers to helmet use, no matter how they were labeled or constructed in the psychosocial theories, were the most important predictors in this study.

In an interesting study exploring recurrent injury, Van Horn (2005) interviewed hospitalized adults with a history of nonviolent unintentional injury. As expected, most participants reported high levels of susceptibility to injury, having been injured at least

more than once, all of whom reported at least one strategy to minimize future injuries. Few participants reported barriers to injury prevention, which is not surprising in light of a recent injury.

While the HBM was originally developed and intended for use as a tool to understand heath screening, the usefulness of the model has been expanded to include injury prevention. These injury prevention measures included both tangible actions, such as wearing protective equipment, and decision-making strategies to prevent future occurrences. To date, the HBM has not been applied to safety behaviors, and the information gleaned from Montana licensed outfitters can help inform educational efforts targeted toward care of injured and ill people in the wilderness.

Summary

The significance of injury prevention is reflected in the CDC Injury research Agenda, and one listed goal is central to wilderness safety: "Identify risk and protective factors for and evaluate interventions to prevent injuries from outdoor recreation" (2002a, p. 33.). Exploring the safety behaviors of licensed outfitters in Montana is one step toward identifying risk and protective factors that may play a role in injury prevention in Montana's wilderness. Focusing on Montana's licensed outfitters, we have the ability to gain important information about safety behaviors and health beliefs that may ultimately drive how injuries and illnesses are managed in the Montana wilderness.

CHAPTER THREE

METHODS

Design

The study used a descriptive correlational design to explore the relationship between health beliefs, remoteness and safety behaviors. A descriptive correlational design is best suited to research that is attempting to uncover associations between variables and help inform further research and hypothesis development (Burns & Grove, 2001). The hypothesized dependant variables are safety behaviors.

Data was gathered via a self-report instrument created for this study. Self-report is a useful and reliable way to gather information that cannot be objectively measured in any other way, as in attitudes and beliefs (Baldwin, 2000).

Population and Sample

Outfitters licensed by the Montana State Board of were selected to participate in the study. A list was obtained for the year 2004 from the State of Montana Board of Outfitters and all 640 outfitters licensed by the State of Montana were sent a questionnaire. Non-responders, a total of 212, were sent a second questionnaire. A total of 428 (67%) questionnaires were returned. Blank questionnaires, and questionnaires with uncompleted pages or sections were excluded from analysis (N=32), which left 396 (62%) for initial analysis. In addition, 136 questionnaires were excluded for having more

than twenty percent missing data by list-wise deletion using SPSS, leaving 260 (41%). After statistical imputation of the remaining questionnaires, 12 more questionnaires were excluded. A total of 248 (38%) questionnaires were included in the final data analysis, providing complete data for every item.

Instrument

No instrument had been published that addressed the research questions posed in this study. Dillman's Tailored Design Method (2000) was used to assist in developing a survey that would yield a high return of respondents. An instrument was designed with a foundation of wilderness safety in mind. The wilderness injury and illness instrument was separated into five parts collecting descriptive information (Part A), safety behavior information (Part B), illness and injury encounters (Part C), health beliefs (Part D), and demographic information (Part E). See Appendix A.

The first part of the wilderness injury and illness instrument (Part A) collected basic descriptive data about the type of professional outfitter license, background as an outfitter and guide, type of activities offered by the professional outfitter, level of first aid certification and remoteness.

The second part of the instrument (Part B) collected data about safety behaviors and was derived from a combination of resources; formal interviews with licensed outfitters; Wilderness Medical Society Practice Guidelines for Wilderness Emergency care (Forgey, 2000); NOLS Wilderness Educator Notebook (Gookin, 2003); and Mountain Rescue Association General Backcountry Safety (Shimanski, 2002). Safety behaviors were chosen for inclusion based on importance to injury or illness

management, usefulness to both hunters and fisherman, and appropriateness for lay persons as opposed to those with medical training. The safety behaviors were categorized into groups: actions taken prior to leaving for a wilderness trip, information provided to clients prior to leaving on a wilderness trip and items taken on a wilderness trip.

The third part of the instrument (Part C) collected information about the types of illness and injuries encountered by the professional outfitters during the previous two years, and the first aid measures most often taken during wilderness trips, as well as experience with death in the wilderness. A single question about alcohol use during wilderness trips was also included. This information was based on literature review and epidemiological data from wilderness injury and illness studies.

Part D of the instrument assessed the HBM constructs using Champion's instrument (1984) as the foundation for verbiage and themes. Champion developed a survey in 1984 to assess HBM constructs in relation to mammography screening that consisted of questions assessing susceptibility, seriousness, benefits and barriers to obtaining mammography screening. Part E of the instrument collected basic demographic information, such as age, gender, race, income, etc.

The initial instrument was presented to licensed guides as well as outdoor enthusiasts in southwestern Montana. The outdoor enthusiasts and guides were interviewed, as well, regarding attitudes about wilderness injuries and illness and the safety measures taken to prevent them. This helped to hone the instrument's relevance and specificity to Montana professional outfitters. In a recursive process with licensed guides, outdoor enthusiasts and thesis committee members, the instrument was modified

until consensus determined that the research questions could be answered and the instrument was interesting and relevant to Montana professional outfitters. Face and content validity were assured by review with licensed guides, local outdoor leaders and thesis committee members.

The wilderness injury and illness instrument became a 28-question self-report questionnaire with 107 items that collected demographic information, safety behavior information, recent experience with wilderness injury and illness, and perceptions of preparation (see Appendix A).

Procedures

Data was collected from Montana licensed outfitters. Institutional Review Board approval was obtained from Montana State University (See Appendix B). Each participant was assigned a numeric code, which was written on the cover of the instrument for initial tracking purposes. Participants were informed in an introduction letter and on the cover of the survey that completion and return of the survey constituted consent to participate in the study. (See Appendix A)

Following Dillman's guidelines (2000), a pre-letter was mailed to all licensed outfitters, briefly explaining the purpose of the study. Approximately one week later, the instrument, along with a cover letter and a pre-addressed, stamped return envelope, was mailed to the licensed outfitters. Both the cover letter and an introduction printed on the questionnaire outlined the purpose and procedures of the study, explaining that the questionnaire would be returned in anonymous fashion, and that return of the questionnaire implied consent to participate in the study. In keeping with Dillman's

method, a reminder card was mailed to the remaining non-responders approximately one week after the first questionnaire. One week after the reminder cards were mailed, a second questionnaire, cover letter and pre-addressed stamped return envelope were mailed to the remaining non-responders with a deadline by which to return the questionnaire. The original list of participant names, addresses and assigned participant codes was destroyed after the deadline.

Treatment of Data

Measurement of Dependant Variable

The dependant variable of safety behaviors was conceptualized as three distinct components measuring the actions that outfitters take prior to leaving on a trip (Actions), e.g., providing a required equipment list or assessing a client's level of skill; information provided to clients about safety (Information), e.g., basic wilderness safety or hydration; and items (Items) taken on trips to help manage injury and illness in remote areas, e.g., a two-way radio or first aid kit. Actions were measured on a 5-point likert scale by asking outfitters to identify how often they adopted a list of ten actions prior to leaving on a trip ranging from "always"(1) to "rarely"(5), and included "never" (0). During statistical analysis, the items were reverse-coded, such that "always" = 5, and "rarely" = 1. The variable for Actions was the average of the reverse- coded likert ratings for all ten items. The Information variable was measured in the same way, by asking outfitters to rate how often they spoke to clients about a list of six topics, and the reverse-coded average of the likert rating for all six items was the Information score. Items were also measured in the same manner, by asking outfitters to rate how often they took specific items with them on

trips, and the variable for Items was the reverse-coded average of the response for all thirteen items. Reliability for the measurement of the safety scores are reported in Table 1. The data was analyzed using SPSS software.

Table 1. Reliability measurement of safety behaviors

Safety Behaviors	Number of Items	Cronbach's Alpha
Actions Assess clients' physical condition Require medical clearance Evaluate level of experience Evaluate level of skill Provide required equipment list Inspect clients' equipment Require/provide water or purification device Require/provide hand sanitizer or soap Establish basic safety rules	9	.726
Information Basic safety rules Bear/animal safety Basic wilderness safety Hydration Sun protection Sanitation/hygiene	6	.790
Items Cell phone Two-way radio Satellite phone Global positioning system Flare gun Water-proof matches Compass Local map First aid kit Snake bite kit Bear/pepper spray First aid manual Wilderness medicine manual	13	.720

Measurement of the Independent Variables

Remoteness was measured by a single question asking the distance in miles from the average hunting or fishing site to the nearest hospital with emergency facilities. The constructs of the HBM were measured by a set of 15 items (see Appendix A). Each construct (seriousness, susceptibility, benefits, barriers and cues to action) was made up of three statements measured by level of agreement on a 5-point likert scale. Initial data analysis showed very low reliability for each construct via Crohnbach's Alpha, so a single question was chosen for each of the five constructs that seemed to best represent the theme of the construct. Seriousness was measured by a reversal of the level of agreement to the statement "The wilderness injuries I've seen or heard about are not severe". Susceptibility was measured by level of agreement with the statement "On an average trip in the wilderness, a life-threatening event could happen at any time". Benefits were measured by level of agreement with the statement "If I had additional first aid training I could help injured and ill clients". Barriers were measured by level of agreement with the statement "It is too expensive to get additional training". Cues were measured by level of agreement with the statement "Personal experience with wilderness injury has influenced my first aid training".

CHAPTER FOUR

RESULTS

Sample Description

The vast majority of respondents were male (97.2%), white (97.6%), and married (82.3%). The mean age of the respondents was 50 (SD 10.35) years old, ranging in age from 28 to 73 years of age. More than half of the respondents (60.5%) reported outfitting as their primary occupation providing their primary source of income, and just under half (46%) reported an annual income of more than $60,000. The highest level of education completed was varied among the respondents, with 76.2 % having at least attended some college. The majority of outfitter licenses were held by fishing outfitters (69%), followed by hunting outfitters (53%), general outfitters (47%) and livestock outfitters (28%). Some of the licensed outfitters had advanced first aid training specific to the wilderness setting (just over 11%) and most of the outfitters (77%) had basic life support or CPR. Nineteen percent of the outfitters had no first aid training beyond the required basic first aid certification (see Table 2).

Table 2. Sample description (N = 248)

Age Mean = 49.65 years (SD 10.345) Ranging from 28-73 years		
Response	Frequency	% of Total Sample
Gender		
Male	241	97.2
Female	7	2.8
Marital Status		
Single	15	6

Living with partner	10	4
Married	204	82.3
Widowed	2	.8
Divorced	17	6.9
Race		
Hispanic	1	.4
Native American	5	2
White	242	97.6
Education		
Some High School	3	1.2
High School Graduate	56	22.6
Some College	75	30.2
College Graduate	82	33.1
Graduate School	28	11.3
Professional Degree	4	1.6
Yearly Income		
Less than $10,000	2	.8
$10,000 – 20,000	12	4.8
$20,000 – 30,000	28	11.3
$30,000 – 40,000	33	13.3
$40,000 – 50,000	34	13.7
$50,000 – 60,000	25	10.1
More than $60,000	114	46
Primary Occupation is Outfitting		
Yes	150	60.5
No	98	39.5
Type of outfitting licensure*		
General Outfitter	118	47
Hunting Outfitter	132	53
Fishing Outfitter	170	69
Livestock Outfitter	70	28
First aid certification beyond Basic First Aid*	47	19
None	190	77
CPR or Basic Life Support	25	10
Wilderness First Aid	17	7
First Responder	3	1
Wilderness First Responder	12	5
Emergency Medical Technician (any level)	1	<1
Wilderness Emergency Medical Technician		

*Total>100%, respondents could choose more than one answer.

Independent and Dependent Variables

Means were calculated for the independent and dependant variables. The grand mean for safety behaviors (measured on a 5-point likert scale) was calculated; the grand mean for Actions was 2.55 (SD .88), the grand mean for Items was 3.85 (SD .79), the grand mean Information was 2.65 (SD 1.15). The mean distance from the usual hunting or fishing site to the nearest hospital with an emergency room was 45.94 miles (SD 24.85). A grand mean for each HBM construct (measured on a 5-point likert scale) was measured. The grand mean for Susceptibility item was 1.74 (SD = .87); the grand mean for Seriousness item was 3.17 (SD = 1.01); the grand mean for Benefits item was 2.70 (SD = .90); the grand mean for Barriers item was 3.52 (SD = .99); the grand mean for Cues item was 2.74 (SD = 1.02).

Table 3. Means and Standard Deviations (SD) for Variables

Variable	Mean	SD
Distance	45.96	24.85
HBM Constructs		
Susceptibility	1.74	.87
Seriousness	3.17	1.01
Benefits	2.70	.90
Barriers	3.52	.99
Cues to Actions	2.74	1.02
Safety Behaviors		
Actions	2.55	.88
Information	2.65	1.15
Items	3.85	.79

Hypothesis 1: Remoteness and Safety Behaviors

Assumptions of normality for the parametric correlation were not met, so a nonparametric correlation, Spearman's Rho, was calculated to test Hypotheses 1. There

was a statistically significant positive Spearman's Rho correlation at the 0.01 level between remoteness and safety behaviors. The Spearman's correlation between remoteness and Actions was .25 ($p<0.01$); between remoteness and Information was .16 ($p<0.01$); and between remoteness and Items was .17 ($p<0.01$) (see Table 4). Greater distances between the usual hunting or fishing site and the nearest emergency medical facility were associated with higher averages of all types of safety behaviors (e.g., more actions taken prior to a trip, more information provided, and more items taken on a trip).

Hypothesis 2: HBM Constructs and Safety Behaviors

Again, using a non-parametric test, Spearman's Rho, the mean of each construct of the HBM and the mean of each safety behavior were correlated to test Hypothesis 2. There was a statistically significant positive Spearman's Rho correlation ($p < 0.01$) between cues to action and the mean for each type of safety behavior. The Spearman's correlation between Cues and Actions was .18 ($p<0.01$); between Cues and Information was .31 ($p<0.01$); and between Cues and Items and .22 ($p<0.01$) (see Table 4). High levels of agreement with the statement "Personal experience with wilderness injury or illness has influenced my first aid training" was associated with a high average of safety behaviors. There was also a statistically significant positive Spearman's Rho correlation ($p <0.05$) between Benefits and Information of .14 (see Table 4). High level of agreement with the statement "If I had additional first aid training I could help injured and ill clients" was associated with a high average of safety information topics provided to clients.

Table 4. Spearman's Rho correlations for hypotheses 1 & 2

	Actions	Information	Items
Remoteness	.25 **	.16 **	.17 **
HBM Constructs:			
Seriousness	-.07	-.05	-.02
Susceptibility	.05	.02	.12
Benefits	.06	.14 *	.10
Barriers	.01	.02	.01
Cues	.18 **	.31 **	.22 **

** $p < 0.01$ * $p < 0.05$

CHAPTER FIVE

DISCUSSION

One quarter of all Americans took an outdoor adventure vacation in 2004 and people are seeking wilderness experiences in record numbers (Outdoor Industry Association, 2005). With so many people in remote areas, safety and injury prevention is a concern, especially in Montana, where unintentional injuries are a leading cause a death (Department of Health and Human Services, Center for Disease Control, 2002a). Montana licensed outfitters often take people who seek outdoor adventure into remote areas of Montana wilderness, assuming some responsibility for managing illness and injury should it occur. Identifying the way remoteness and health beliefs relate to safety behaviors of Montana licensed outfitters is a crucial step in empowering licensed outfitters to provide essential and appropriate emergent health care in the wilderness.

Remoteness and Safety Behaviors

A moderate positive correlation was found between remoteness and all safety behaviors measured in this study of licensed outfitters in Montana. Greater distance was associated with taking more actions (e.g., assessing a clients' physical condition and evaluating a clients' level of skill or requiring water purifiers and hand sanitizer or soap), reviewing more information with clients (e.g., wilderness safety, hydration, sun protection or hygiene), and taking more items on a trip (e.g., some form of communication, map, compass, first aid kit or bear/pepper spray). This finding seems to

indicate that outfitters perceive distance as a risk factor that requires additional preparation for wilderness injury and illness because distance and remoteness will dictate how long the licensed outfitters will need to manage the injury or illness in the wilderness before help arrives.

The mean distance from the licensed outfitters' usual hunting or fishing site to the nearest emergency medical facilities was approximately 45 miles, which would require a considerable amount of time to travel into limited access wilderness via horse, boat or foot. Outfitters in this study who travel into remote areas appear more likely to prepare for the responsibility that falls to them in remote areas to prevent and minimize illness and injury in the wilderness. This makes sense; the perception of the risk of a client suffering a wilderness injury or illness is greater in remote areas because the time to treatment is longer, the delay in getting care makes prevention a priority and early treatment and transport vital. The actual risk, however, does not change.

This information is helpful in guiding efforts toward increasing safety behaviors of licensed outfitters by helping to tailor messages about remote injury and illness prevention. Knowing that distance plays a role in driving safety behavior could prompt a campaign targeted to licensed outfitters that sends a message modifying the perception of distance. Raising awareness about actual treatment times could be crucial. The focus in a campaign should be on how long it takes to reach, treat and transport an ill or injured client that is only ten or twenty miles from an emergency room (see Table 5, p. 41).

A moderate positive correlation was found between the item assessing Cues and the mean of all three safety behaviors; Actions, Information and Items. High levels of agreement with the statement "Personal experience with wilderness injury or illness has influenced my first aid training" were associated with high average scores on Actions (e.g., requiring a medical clearance form, assessing client's level of skill or checking a client's equipment for soundness), Information (e.g., reviewing animal/bear safety or sun protection) and Items (e.g., carrying a flare gun, map and compass, snake bite kit or wilderness medicine manual). This means that cues to action have a role in determining safety behaviors, supporting the notion that health beliefs prompt safety behaviors.

Consider that safety behavior scores were not associated with Susceptibility or Seriousness. Taken in light of the association between Cues and safety behaviors, the wilderness illness and injury prevention efforts of licensed outfitters in this study were only substantially prompted by previous experiences. Uncovering this information points to a flaw in the current means of knowledge transfer.

Montana's licensed outfitters are managing illness and injury in the wilderness taking action, providing information, and items to ensure their clients' safety. However, the strongest health belief associated with safety behaviors was experience with previous injury, and few licensed outfitters in this study had first aid training beyond CPR and the required basic first aid course. Montana's outfitters seem to rely, then, on informal apprenticeships and past experience to learn wilderness injury and illness prevention and management skills, suggesting that the basic first aid course may not be the appropriate

choice to empower outfitters to manage injuries and illness in a remote wilderness setting.

A moderate positive correlation was also found between the item assessing Benefits and the mean of the items assessing Information. High levels of agreement with the statement "If I had additional first aid training, I could help injured and ill clients" were associated with high scores on the information items (e.g. reviewing basic wilderness safety, hydration and sanitation/hygiene). This association indicates that licensed outfitters who see benefit in first aid training and a preventive approach to injury prevention also provide high levels of information to their clients. This strength of Montana's licensed outfitters, hints at motivation to improve safety and provide information that keeps their clients safe, illness and injury free in the wilderness.

Playing to the outfitters' strengths, replacing the current required basic first aid with a tailored wilderness-oriented basic first aid course would provide the benefit of appropriate training without the burden of additional training. An appropriate first aid course has been shown to improve not only first aid skills, but also develop risk control and injury prevention in the occupational health setting (Lingard, 2000). The licensed outfitters in this study express a positive association between the desire to have additional training and an increase in the provision of safety knowledge. Enhancing that association by altering the first aid requirement may be a natural progression. Using the current apprenticeship system, an appropriate first aid course ideally would be taught by experienced outfitters, adding credibility and meaning to the material (see Table 5, p. 41). Content could be developed by the experienced outfitters in collaboration with wilderness medicine experts to ensure accurate information.

Study Limitations

The instrument used in this study was created specifically for this study and the validity of the HBM items were questionable from the start. The initial internal reliability coefficients were not adequate, and the single items chosen for representation may not have measured the constructs of the HBM.

Further, a different theoretical model that explores economical benefits of injury prevention to the oufitters' may have been a better fit for the licensed outfitter-client relationship. The HBM may have been a weak match as an intrapersonal model between the economic relationship of the licensed outfitter and their clients. As clients pay for the services of the licensed outfitter, the licensed outfitters could be prompted more by a financial service agreement than by ensuring the well being of their client.

Another factor that could have impacted the collected information is that this study did not include licensed guides. The benefit of obtaining outfitter licensure instead of guide licensure pertains to inclusion in the State Board of Outfitters published list of licensed outfitters, the right to advertise for services, the right to hire a licensed guide to perform services in place of the licensed outfitter, and the ownership and upkeep of equipment. The licensed guides could provide a different safety behavior profile, as they could be in more remote areas more often than licensed outfitters, serving as employees of outfitters.

Future Research

This study has provided basic information about safety behaviors and wilderness injury and illness encountered by licensed outfitters in Montana. Licensed outfitters in

Montana are not required to have certification beyond basic first aid, though their safety behaviors seem to reflect knowledge beyond that which basic first aid provides. Understanding what motivates the outfitters to seek out this knowledge, and how the outfitters learn these skills and information is very important because they hold the keys to injury and illness control in the wilderness. While the safety behaviors of licensed outfitters in Montana hint at a proactive approach to managing wilderness injuries and illness, there is no evidence to suggest that the learning occurs in a proactive manner. The skills and safety behaviors of outfitters may be passed down, or learned over time in an informal way, since no formal wilderness specific safety or injury and illness management information is required or provided by the Board of Outfitters in Montana.

Additional information about the specific interventions that licensed outfitters use in the wilderness to stabilize injuries, and the strategies and means by which they manage and transport injuries and illness in the wilderness, could also provide more valuable information about the efforts that outfitters take to ensure client safety. This, along with the current information about licensed outfitters safety behaviors, could target efforts directed at transferring wilderness injury and illness prevention information to the general public.

Further, determining the needs of the different types of outfitters may provide information that is important to safety in the wilderness. For example, the safety behaviors of a fishing outfitter who take clients out on an afternoon trip ten miles away from a city may be quite different from a hunting and livestock outfitter who takes clients out on a weeklong trip on horseback hunting for elk eighty miles away from the nearest

city. Even though the same basic first aid course is required of both outfitters, the risks for injury are clearly different.

Lastly, repeating a refined version of this study in different states would provide very useful information as well. Perhaps the rural nature of the entire state makes Montana licensed outfitters different from, for example, licensed outfitters in New Hampshire. Remoteness is associated with safety behaviors in Montana, but a less rural state may rely on local emergency medical services, and may not feel the need to prepare as Montana outfitters do.

Implications for Practice

Health care providers, especially those in remote or rural areas near wilderness recreation areas, need to be aware of the safety issues involving wilderness recreation. Rural nurse practitioners must know the risks of wilderness recreation, and communicate the appropriate measures to protect their own patients from harm in the wilderness, and facilitate formal educational efforts targeted specifically to outdoor enthusiasts and licensed outfitters. To the rural nurse practitioner, this leaves a previously unvisited area of community and patient education.

As leaders in the community, rural nurse practitioners can play a role strengthening individual knowledge and skills among community members, including licensed outfitters and outdoor enthusiasts (Cohen & Swift, 1999). The results of this study could be used to develop a more appropriate first aid course by relying on the perceptions and beliefs of the outfitters as a group. Designing a tailored message and intervention is useful in adding relevance to a campaign to improve learning (Sethares &

Elliot, 2004). Using a combination of the perception of distance and health beliefs, a wilderness first aid course that includes a tailored message about the time to treat and a real-life wilderness injury scenario could replace the current basic first aid requirement. Such a course would be more labor intensive, but it would provide more meaningful information to the outfitters. Moving the method of learning from an informal retroactive to a formal proactive approach will enhance the chance that a licensed outfitter will know how to manage a specific injury before the injury occurs, rather than learning the skills after experiencing the injury or by word or mouth (see table 5). Legislative change may be called for, if the state requires policy change for the first aid course. Rural nurse practitioners can be important leaders in facilitating change here, especially since this would best be a grass-roots campaign, initiated by the outfitters themselves.

Table 5. Tailored first aid course.

Tailored Design	Developed by respected, experienced outfitters (in collaboration with wilderness medicine experts) Taught by respected, experienced outfitters Practical, hands-on experiences Realistic wilderness setting
Targeted Message	Focus on wilderness setting stabilze and transport issues Prevention is most important do not learn from past mistakes Time to treat matters distance is irrelevant

Initiating community education campaigns about wilderness injury and illness is another way that nurse practitioners can impact the level of first aid knowledge, including wilderness injury skills (Cohen & Swift, 1999; Anderson & Leisey, 2002). An example of this type of program was initiated by Wright State University School of Medicine in

2001 (Anderson & Leisey, 2002). The medical school organized a community event targeting the community, ages 10 and up, and included hands-on demonstrations, seminars and teaching labs on a variety of wilderness and outdoor safety topics. Similar programs can be targeted to the rural nurse practitioners community, as many rural communities in Montana offer outdoor recreation in wilderness areas.

Rural nurse practitioners can also be advocates to change the way in which wilderness injuries are recorded. By taking initiative in the public health arena, rural nurse practitioners have the ability to influence injury surveillance and, eventually, intervention programs. The National Electronic Injury Surveillance System – All Injury Program (NEISS-AIP), as previously discussed, is limited in its ability to inform interventions for injury prevention (Gerson & Stevenson, 2004). A useful surveillance system needs to focus not just on monitoring types of injuries and what kind of activity was involved (e.g., hunting, fishing, horseback riding), but also where the event occurred, the time from incident to treatment and initial treatment in the field. Self-reporting is not customary for outfitters and guides in the United States; however, it is the standard reporting system for outdoor leadership programs in the United States, Australia and New Zealand (Leemon & Schimelpfenig, 2003; Dickson, T.J., 2003). As part of their professional requirements, outfitters are required to keep records of game and equipment; adding injury and illness information would be a natural progression toward injury control.

Conclusion

The main objective of wilderness injury and illness management is targeted at prevention and preparation, though previous studies exploring wilderness injury and illness show a predominance of ill-prepared outdoor enthusiasts. Inquiries into wilderness injuries and illness have not included licensed hunting and fishing outfitters as a specific population. Licensed outfitters play a central role in facilitating wilderness recreation, and must be able to provide on-scene treatment of wilderness injuries and illness. Understanding the safety behaviors of outfitters will help to determine the efforts needed to develop their ability to provide care to the injured and ill in remote wilderness areas.

The purpose of this study was to explore the ways in which remoteness and heath beliefs impact safety behaviors of Montana licensed outfitters. The results of this study suggest that licensed outfitters match their safety behaviors to the remoteness of their hunting or fishing location, the health beliefs of perceived benefits and cues to action. This information can be used to develop a tailored first aid course that includes information about time to treatment, pro-active prevention efforts and wilderness specific information and scenarios. Efforts to continue to examine the safety behaviors of licensed outfitters, in Montana and across the United States, will provide information that can inform injury prevention programs and, if needed, alter policies related to licensure.

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APPENDICES

APPENDIX A

WILDERNESS INJURY AND ILLNESS INSTRUMENT

Wilderness Injury and Illness

Dear Participant,

I invite you to participate in this voluntary project by answering the following questions about your experiences with injury and illness in the wilderness. The purpose of this research is to determine the things that influence how outfitter's prepare for injuries, and the kinds of illness and injuries outfitters have seen and treated in the wilderness. By understanding your experiences and perceptions about providing care for ill or injured clients in remote areas, appropriate training could be developed that might better help you provide treatment in the wilderness. You can help me with this study by taking about fifteen minutes to complete this survey.

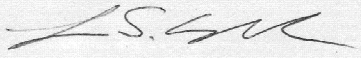
Your answers will be completely confidential and will be released as a summary in which no individual's answers can be identified. To keep this survey anonymous, you have been assigned a numeric code, and your name will not be associated with any of the information you provide. This survey is voluntary, and no one from the State Board of Outfitters or from Montana State University will know whether or not you participated. There will be no direct benefit to you if you return a completed survey, nor will there be any risks involved in participation. By returning a completed survey, you give permission to use your information in this study. If, for some reason, you prefer not to respond, please let me know by returning the blank questionnaire in the enclosed stamped envelope. When you have returned a survey, your name will be deleted from the mailing list, and you will not be contacted again.

This projected has been funded by the Helen Jacobsen Lee Endowment through the College of Nursing at Montana State University, and by a grant from Mazamas, a mountaineering club whose mission includes exploration, research and conservation of mountains, as well as the safe enjoyment of outdoor recreation.

If you have any questions or comments about this study, I would be happy to talk with you. My phone number at Montana State University is (406) 994-2750. You may also contact the chairman of my graduate committee, Dr. Wade Hill, at (406) 994-4011, if you have questions about this study.

Thank you for help with this important project,

Sincerely,



Linda S. Sobeck, RN
Graduate Student
Rural Family Nurse Practitioner Program
Montana State University

Wilderness Injury and Illness

Part A: OUTFITTER ACTIVITIES. Please tell me about your career as an outfitter.

1. **Which of the following licenses do you currently hold? Check ALL that apply**

   - ❑ *General Outfitter*
   - ❑ *Livestock Outfitter*
   - ❑ *Hunting Outfitter*
   - ❑ *Fishing Outfitter*

2. **Which of the following activities can your clients participate in on your trips? Check ALL that apply.**

   - ❑ *Hunting*
   - ❑ *Fishing*
   - ❑ *Backcountry hiking*
   - ❑ *Snowmobiling*
   - ❑ *Backcountry snowsports (li.e., alpine, cross- country or telemark skiing , or snowboarding)*
   - ❑ *Mountaineering*
   - ❑ *Rock Climbing*
   - ❑ *White water rafting or kayaking*
   - ❑ *Riding ATV's*
   - ❑ *Primitive camping*
   - ❑ *Horseback riding*
   - ❑ *Llama trekking*

3. **In what other states or areas are you licensed as a guide or outfitter? Check ALL that apply.**

   - ❑ *None*
   - ❑ *Idaho*
   - ❑ *Wyoming*
   - ❑ *North Dakota*
   - ❑ *South Dakota*
   - ❑ *Yellowstone or Glacier National Park*

   Others, please identify... _____
   _____

4. **How many TOTAL years have you been a licensed or unlicensed guide and outfitter in Montana and/or any other state?** *Include ALL of your years of experience. Round up to the nearest number of years. For example, if you were a guide for eight months and became an outfitter two months ago, you would write " One (1)" year.*

   ___ *Years*

5. **In the last year, roughly how many trips did you personally lead?**

   ___ *Day trips* ___ *Overnight* ___ *Multi-day trips*

6. **Do you hire guides to take your clients on trips without you present?**

   ❑ *Yes* ❑ *No*

7. **Do you require your hired guides to have first aid training beyond Basic First Aid?**

   ❑ *Yes* ❑ *No*

8. **On your average trip, about how far is the nearest hospital with an emergency room?**

   ___ *Miles*

9. **During what seasons do you guide? Check ALL that apply.**

- ❑ *Spring*
- ❑ *Summer*
- ❑ *Fall*
- ❑ *Winter*

10. **In addition to the required Basic First Aid course, which of the following certifications do you have? Check ALL that apply.**

- ❑ *CPR or Basic Life Support*
- ❑ *Wilderness First Aid*
- ❑ *First Responder*
- ❑ *Wilderness First Responder*
- ❑ *Emergency Medical Technician (any level)*
- ❑ *Wilderness Emergency Technician*
- ❑ *None*

Part B PREPARATION AND SAFETY:
The following questions ask about the things you do to prepare for your trips. Please mark the box that best fits what you do.

11. **How often do you take following actions before you take a trip with clients?**

		Always	*Most of the time*	*Sometimes*	*Seldom*	*Rarely*	*Never*
A)	Assess clients' physical condition	❑	❑	❑	❑	❑	❑
B)	Require a medical clearance form	❑	❑	❑	❑	❑	❑
C)	Evaluate client's level of experience	❑	❑	❑	❑	❑	❑
D)	Evaluate client's level of skill	❑	❑	❑	❑	❑	❑
E)	Provide a "required equipment" list	❑	❑	❑	❑	❑	❑
F)	Inspect clients equipment for completeness and soundness	❑	❑	❑	❑	❑	❑
G)	Require or provide a method of water purification	❑	❑	❑	❑	❑	❑
H)	Require or provide hand sanitizer/soap	❑	❑	❑	❑	❑	❑
I)	Establish basic safety rules	❑	❑	❑	❑	❑	❑

12. **Under what conditions do you allow alcohol? Please check ALL that apply.**

- ❑ *I provide some alcohol on my trips*
- ❑ *I allow clients to bring their own alcohol on trips*
- ❑ *I only allow alcohol consumption at certain times during a trip (e.g., at the end of the day or at camp. etc.)*
- ❑ *I allow alcohol consumption any time my clients wish to drink*
- ❑ *I discourage the consumption of alcohol during my trips*
- ❑ *I prohibit alcohol on my trips*

Continued on the next page…

13. How often do you review the following topics with your clients?

	Always	Most of the time	Sometimes	Seldom	Rarely	Never
A) Your basic safety rules	❑	❑	❑	❑	❑	❑
B) Bear/animal safety	❑	❑	❑	❑	❑	❑
C) Basic wilderness safety	❑	❑	❑	❑	❑	❑
D) Hydration	❑	❑	❑	❑	❑	❑
E) Sun protection	❑	❑	❑	❑	❑	❑
F) Sanitation/hygiene	❑	❑	❑	❑	❑	❑

14. How often do you take the following items on your trips?

	Always	Most of the time	Sometimes	Seldom	Rarely	Never
A) Cell phone	❑	❑	❑	❑	❑	❑
B) Two-way radio	❑	❑	❑	❑	❑	❑
C) Satellite phone	❑	❑	❑	❑	❑	❑
D) Global Positioning System (GPS)	❑	❑	❑	❑	❑	❑
E) Flare gun	❑	❑	❑	❑	❑	❑
F) Water-proof matches or firestarter	❑	❑	❑	❑	❑	❑
G) Compass	❑	❑	❑	❑	❑	❑
H) Local map	❑	❑	❑	❑	❑	❑
I) First aid kit	❑	❑	❑	❑	❑	❑
J) Snake bite kit	❑	❑	❑	❑	❑	❑
K) Bear/pepper spray	❑	❑	❑	❑	❑	❑
L) General first aid manual	❑	❑	❑	❑	❑	❑
M) Wilderness medicine manual	❑	❑	❑	❑	❑	❑

Part C **WILDERNESS INJURY AND ILLNESS EXPERIENCES:**
Please tell me about the experiences you've had with illness and injury while guiding in the wilderness. Please mark the box that best fits your experience.

15. In the *last two (2) years*, how often have you had to assist a client with the following illnesses? If you have been a guide or outfitter for less than two (2) years, answer based on your experiences so far.

	None	1 time	2 times	3 times	4 times	5 times	More than 5 times
A) Diarrhea/vomiting	❑	❑	❑	❑	❑	❑	❑
B) Hypothermia	❑	❑	❑	❑	❑	❑	❑
C) Frostbite	❑	❑	❑	❑	❑	❑	❑
D) Heat stroke	❑	❑	❑	❑	❑	❑	❑
E) Altitude sickness	❑	❑	❑	❑	❑	❑	❑
F) Loss of consciousness	❑	❑	❑	❑	❑	❑	❑
G) Stroke	❑	❑	❑	❑	❑	❑	❑
H) Heart attack or chest pain	❑	❑	❑	❑	❑	❑	❑
I) Severe allergic reactions	❑	❑	❑	❑	❑	❑	❑
J) Severe breathing problems	❑	❑	❑	❑	❑	❑	❑

16. In the *last two (2) years*, how often have you had to assist a client with the following injuries? If you have been a guide or outfitter for less than two (2) years, answer based on your experiences so far.

	None	1 time	2 times	3 times	4 times	5 times	More than 5 times
A) Eye injuries	❑	❑	❑	❑	❑	❑	❑
B) Severe Sunburn	❑	❑	❑	❑	❑	❑	❑
C) Severe cuts or scrapes	❑	❑	❑	❑	❑	❑	❑
D) Sprains/muscle injuries	❑	❑	❑	❑	❑	❑	❑
E) Dislocations	❑	❑	❑	❑	❑	❑	❑
F) Broken Bones	❑	❑	❑	❑	❑	❑	❑
G) Snake bites	❑	❑	❑	❑	❑	❑	❑
I) Animal attacks or bites	❑	❑	❑	❑	❑	❑	❑
J) Head Injury	❑	❑	❑	❑	❑	❑	❑
K) Knife wounds	❑	❑	❑	❑	❑	❑	❑
L) Gunshot wounds	❑	❑	❑	❑	❑	❑	❑
M) Severe trauma from a fall or accident	❑	❑	❑	❑	❑	❑	❑
N) Near Drowning	❑	❑	❑	❑	❑	❑	❑

17. In your *entire career* as a guide and outfitter, how many times have you had a death on a trip for the following reasons?

	None	1 time	2 times	3 times	4 times	5 times	More than 5 times
A) Death from a heart attack or stroke	❑	❑	❑	❑	❑	❑	❑
B) Death from an accident	❑	❑	❑	❑	❑	❑	❑

Continued on the next page...

18. **In the *last two (2) years*, how often have you had to take the following actions to help an injured or sick client? If you have been a guide or outfitter for less than two (2) years, answer based on your experiences so far.**

	None	1 time	2 times	3 times	4 times	5 times	More than 5 times
A) Apply ice/cold pack to an injury	❑	❑	❑	❑	❑	❑	❑
B) Wrap an injured joint or muscle	❑	❑	❑	❑	❑	❑	❑
C) Immobilize/ splint an injured arm/leg	❑	❑	❑	❑	❑	❑	❑
D) Immobilize/splint an injured neck/back	❑	❑	❑	❑	❑	❑	❑
E) Reduce a dislocation (put it back in place)	❑	❑	❑	❑	❑	❑	❑
F) Clean and bandage a wound	❑	❑	❑	❑	❑	❑	❑
G) Stitch-up a severe cut	❑	❑	❑	❑	❑	❑	❑
H) Stop severe bleeding with direct pressure	❑	❑	❑	❑	❑	❑	❑
I) Give a client his or her medication (e.g., nitroglycerine pills for chest pain)	❑	❑	❑	❑	❑	❑	❑
J) Perform chest compressions and rescue breathing (CPR)	❑	❑	❑	❑	❑	❑	❑

19. **In the *last two (2) years*, how often have you had to take the following actions on a trip? If you have been a guide or outfitter for less than two (2) years, answer based on your experiences so far.**

	None	1 time	2 times	3 times	4 times	5 times	More than 5 times
A) Cut a trip short because of an ill or injured client	❑	❑	❑	❑	❑	❑	❑
B) Assist a client who could not walk due to an illness or injury during your trip	❑	❑	❑	❑	❑	❑	❑
C) Transport an unconscious client	❑	❑	❑	❑	❑	❑	❑
D) Taken a client to the emergency room due to illness or an injury	❑	❑	❑	❑	❑	❑	❑
E) Called an ambulance or Emergency Medical Services (EMS) to meet you at a trail head to pick up an injured or sick client	❑	❑	❑	❑	❑	❑	❑
F) Required a helicopter transport for a sick or injured client	❑	❑	❑	❑	❑	❑	❑
G) Required a search and rescue team to assist in the wilderness with a sick or injured client	❑	❑	❑	❑	❑	❑	❑
H) Spent an unexpected night out in the wilderness with your clients	❑	❑	❑	❑	❑	❑	❑
I) Refused to take a client out due to safety concerns about a clients' health or behavior	❑	❑	❑	❑	❑	❑	❑
J) Refused a trip based on environmental factors (weather, etc.)	❑	❑	❑	❑	❑	❑	❑

Part D THOUGHTS ABOUT FIRST AID AND WILDERNESS INJURIES

For the following questions, please indicate how strongly you agree or disagree with each statement. THERE ARE NO RIGHT OR WRONG ANSWERS. Everyone's personal experiences and circumstances are different, and I would like to know about YOUR thoughts.

20. Please indicate your level of agreement with the following statements about injuries and illness in remote areas:

		Strongly agree	*Agree*	*Neither agree nor disagree*	*Disagree*	*Strongly disagree*
A)	Additional first aid training helps me prepare for wilderness injuries and illness.	❑	❑	❑	❑	❑
B)	The result of most wilderness injuries and illnesses will be the same no matter what additional training I have.	❑	❑	❑	❑	❑
C)	Hearing about experiences of other guides or outfitters has influenced my first aid training.	❑	❑	❑	❑	❑
D)	On an average trip in the wilderness, a life-threatening event could happen at any time.	❑	❑	❑	❑	❑
E)	It is too expensive to get additional training.	❑	❑	❑	❑	❑
F)	The wilderness injuries I've seen or heard about are not severe.	❑	❑	❑	❑	❑
G)	The chance of a client suffering from a wilderness injury is great.	❑	❑	❑	❑	❑
H)	If I had additional first aid training I could help injured and ill clients.	❑	❑	❑	❑	❑
I)	I do not know where to find additional wilderness first aid training classes.	❑	❑	❑	❑	❑
J)	Most of the time, I am so far away from emergency healthcare services that I have to rely on myself to help injured and sick clients.	❑	❑	❑	❑	❑
K)	I am too busy with my life and my job to get additional training.	❑	❑	❑	❑	❑
L)	Emergency and rescue workers are close enough to provide aid in the wilderness for my clients should an injury occur.	❑	❑	❑	❑	❑
M)	I have helped injured or sick clients because of my advanced first aid skills.	❑	❑	❑	❑	❑
N)	The thought of handling a serious injury or illness in the wilderness scares me.	❑	❑	❑	❑	❑
O)	Personal experience with wilderness injury or illness has influenced my first aid training.	❑	❑	❑	❑	❑

21 How prepared do you feel to care for a sick or injured client in the wilderness?

❑ *Not at all prepared* ❑ *A little prepared* ❑ *Somewhat prepared* ❑ *Moderately prepared* ❑ *Fairly Well Prepared* ❑ *Very well prepared*

Continued on the next page…

Part E BACKGROUND INFORMATION:
For the following questions, please provide information about your self.

22. How old are you?
___ *Years*

23. Are you male or female?
❑ *Male* ❑ *Female*

24. Which of the following describes your marital status? Please check the one best response.
❑ *Single* ❑ *Married* ❑ *Divorced*
❑ *Living with partner* ❑ *Widowed* ❑ *Separated*

25. What is your racial background? Please check the one best response.
❑ *Asian or Pacific Islander* ❑ *Hispanic* ❑ *White/Caucasian*
❑ *Black/African American* ❑ *Native American*
Other, Please specify.... _____

26. What is your HIGHEST level of education? Please check the one best response.
❑ *Some High School* ❑ *Some College* ❑ *Graduate School*
❑ *High School Graduate* ❑ *College Graduate* ❑ *Professional Degree (Physician, Lawyer, etc.)*

27. Is Outfitting your primary occupation providing your primary source of income?
❑ *Yes* ❑ *No*

If "No", please write in your primary occupation _____

28. What was your individual total gross income last year (from all sources)? Please check one response.
❑ *Less than $10,000* ❑ *$40,000 - 50,000*
❑ *$10,000 - 20,000* ❑ *$50,000 - 60,000*
❑ *$20,000 - 30,000* ❑ *More than $60,000*
❑ *$30,000 - 40,000*

YOU HAVE COMPLETED THE SURVEY! Thanks for your time and effort!

I welcome your comments about first aid or injuries in the wilderness.
If you have anything to add or stories to share please write below:

APPENDIX B

IRB APPROVAL

MONTANA STATE UNIVERSITY
BOZEMAN

INSTITUTIONAL REVIEW BOARD

For the Protection of Human Subjects

308 Leon Johnson Hall
P.O. Box 173080
Montana State University
Bozeman, MT 59717-3080
Telephone: 406-994-4411
FAX: 406-994-4398
E-mail: wwami@montana.edu

Chair: Mark Quinn
406-994-5721
mquinn@montana.edu
Administrator:
Stephen Guggenheim
406-994-4411
awmsg@montana.edu

MEMORANDUM

TO: Linda Sobeck

FROM: Mark Quinn, Ph.D. Chair Mark Quinn
Institutional Review Board for the Protection of Human Subjects

DATE: November 3, 2004

SUBJECT: *Wilderness Injury: Factors that Predict Preparedness of Montana Outfitters*

The above research, described in your submission of November 1, 2004 is exempt from the requirement of review by the Institutional Review Board in accordance with the Code of Federal Regulations, Part 46, section 101. The specific paragraph which applies to your research is

___ (b)(1) Research conducted in established or commonly accepted educational settings, involving normal educational practices.

_X_ (b)(2) Research involving the use of educational tests, survey procedures, interview procedures or observation of public behavior.

___ (b)(4) Research involving the collection or study of existing data, documents, records, pathological specimens, or diagnostic specimens, if these specimens are publicly available, or if the information is recorded by the investigator in such a manner that the subjects cannot be identified.

___ Other

Although review by the Institutional Review Board is not required for the above research, the Committee will be glad to review it. If you wish a review and committee approval, please submit 3 copies of the usual application form and it will be processed by expedited review.