UNDERSTANDING BACKCOUNTRY BEHAVIORS AFTER PARTICIPATION IN A RECREATIONAL AVALANCHE COURSE

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ABSTRACT: A growing number of people are venturing into the backcountry each year. Many of these individuals are participating in avalanche training. However, little is known about the impact of avalanche education on participants' post-course behaviors. The purpose of the study was to gain an understanding of participants' perceptions of behaviors before and after taking a recreational avalanche course. During the 2021-22 season, a 29-question retrospective pretest-posttest survey was used to gather individuals' perceptions of their behaviors during three time periods. The survey was distributed via email to all students who had taken the course during different time intervals; 6 weeks (winter 2022-2023), 1 year (winter 2021-2022), and 2 years (winter 2020-2021). The majority of students have spent 2 to 5 winters in the backcountry (44.89%). The sample is composed of mostly males (64.21%) and used skis as their mode of travel (62.21%). Most participants (40-60%) practiced avalanche rescue 1–2 times after the course. Participants in each of the time frames reported a statistically significant increase in perception of frequency in all categories of behaviors; trip planning, before leaving a trailhead, and during backcountry travel ($p < 0.001$). Results from the study help to understand participant behaviors 6 weeks, 1 year, and 2 years after completion of a course. This understanding can enable educators, forecasters, practitioners, and researchers to gain insight into the backcountry behaviors of avalanche course participants and improve risk management curricula and interventions in response.

KEYWORDS: Avalanche education, behaviors, backcountry travel

1. INTRODUCTION

Engaging in winter recreation in avalanche terrain carries inherent risks and poses a threat to individuals venturing into the backcountry. Over the period from 2013 to 2022, a total of 322 avalanche-related fatalities were documented in North America, as reported by Avalanche Canada (2022) and the Colorado Avalanche Information Center (CAIC) (2022). The popularity of winter backcountry travel has been growing, leading to an increased number of people recreating in avalanche terrain. Although it is difficult to quantify the exact number of winter backcountry travelers, Birkeland et al. (2017) noted an increase in the number of winter recreationists in the western US between 1995 and 2017. Moreover, Valle et al. (2022) found that backcountry travelers noticed more people in the backcountry during and after the COVID-19 pandemic and that those who were already backcountry travelers have increased the time they spent in the backcountry during that time. The same study also found that those new to backcountry travel had lower levels of avalanche education and less confidence in evaluating terrain (Valle et al., 2022). The statistics highlight the importance of understanding and mitigating the dangers associated with traveling in avalanche terrain.

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1.1. Avalanche Education

Avalanche education courses aimed at recreational travelers are the primary means for increasing knowledge related to avalanche hazards and traveling in avalanche terrain in order to promote safe behavior in the backcountry. Courses aim to enhance individuals' knowledge, awareness, and skills in order to better equip participants to assess risk, make informed decisions, and minimize the likelihood of being caught in an avalanche. In addition to noting an increase in the number of winter recreationists in the Western US between 1995 and 2017, Birkeland et al. (2017) noted a proportional increase in the number of avalanche accidents. The researchers go on to note that

this could be due to increased access and availability of avalanche education. Limited research has been done specifically addressing the impact of avalanche education on post-avalanche-course behaviors to understand if this could be the case

Studies have been conducted to assess differences between those who have formal avalanche training and those who do not and to identify different population characteristics, behaviors, and beliefs (Jekich et al. 2016; Mannberg et al., 2018; Michaelsen et al., 2022; Ng et al., 2017; Nichols et al., 2018; Silverton et al., 2007). In 2022, Greene, Hendrikx, and Johnson used a pretest-posttest survey to examine participants' change in knowledge, and how the course influenced risk perception, confidence, and decision-making. The study found that avalanche education had a positive impact on participants' risk perception, confidence, and decision-making for winter backcountry travel (Greene, K., Hendrikx, J., & Johnson, J. 2022). Currently, to our knowledge, no research has assessed specific changes in behaviors of winter backcountry travelers who participated in formal avalanche training.

1.2. Study Aims

The current study aimed to understand the influence of avalanche education on behaviors when preparing for and during backcountry travel on snow. The aim of this study was to assess winter backcountry travel behaviors at 6 weeks, 1 year, and 2 years after the completion of a Recreational Level 1 Avalanche Course.

This study's primary aim was to identify participants' perceptions of their own behaviors before and after their recreational courses, with a particular focus on behaviors during trip planning, before leaving a trailhead, and during backcountry travel. The study also provided an understanding of who is participating in backcountry winter education and how often they travel in the backcountry after their avalanche courses.

2. METHODS

2.1 Instrumentation

A retrospective pretest-posttest design, employing an electronic format, was implemented to gather individuals' perceptions of their behaviors before and after participating in the program. Following program completion, participants were asked to reflect on the impact of the program on their behaviors, as well as their behaviors prior to the program (Allen & Nimon, 2007). A retrospective pretest-posttest evaluation design proves valuable when attempting to assess perceived changes resulting from program participation without collecting baseline data prior to program commencement. The 29-question survey consisted of 6 sections: 1) demographics, 2) group dynamics, 3) backcountry behaviors before and after the course (before leaving the trailhead, when planning a backcountry trip, during travel in the backcountry), 4) use of the avalanche forecast after the course, 5) incidents and near-misses, and 6) beliefs about the course. A two-step process was used to establish the face validity of the survey. Two separate parties reviewed the survey questions to ensure they captured specific topics and behaviors, as well as to correct common survey errors. The survey was pilot-tested with the intended survey participants. Principal components analysis (PCA) was used to assess factor loading for the seven survey questions examining backcountry behaviors and the use of avalanche forecasting. A significant Bartlett's test determined strong loading of each item in the survey question. This was found for all seven survey questions across survey groups. Internal consistency of survey question items was determined using Cronbach's alpha for each of the seven survey questions. A Cronbach's alpha of >0.70 was established as strong internal consistency. This was found for all seven survey questions across groups with a range of α = 0.70 - 0.92. This paper will describe the demographics and backcountry behaviors before and after the course.

2.2 Participants

The American Institute for Avalanche Research and Education (AIARE) develops avalanche education curriculum and disseminates the curriculum to avalanche education providers in the US. In addition to supporting recreational education, AIARE provides professional level

training. During the 2022–23 winter, surveys were sent to all AIARE Recreational Level 1 students from the current and past two seasons. Participants were sent surveys at 6 weeks (took course in winter 2022–23), 1 year (took course winter 2021–22), and 2 years (took course winter 2020–21) after their course participation. Respondents were categorized into three groups. Group 1 comprises AIARE students who completed the course approximately 6-weeks prior. Group 2 comprises AIARE students who completed the course approximately 1-year prior. Group 3 comprises AIARE students who completed the course approximately 2-years prior *(see Table 1)*.

Table 1: Categorization of responses into groups.

	Group 1	Group 2	Group 3
Time post course	6 weeks	1 year	2 year
Winter	2022-2023	2021-2022	2020-2021

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2.3 Data Collection

From December 2022 to June 2023, surveys were distributed via email to all students who had completed a recreational avalanche course either 6 weeks (mean duration of 6.18 weeks), 1 year (equivalent to 58.16 weeks), or 2 years (mean duration of 109.99 weeks) prior (*see Table 1*). The survey was distributed using AIARE's email marketing platform, Mailchimp. Surveys were sent out weekly; on a given Monday, a staff member sent a pre-written email invitation explaining the purpose of the survey to students who had completed a course 6 weeks, 1 year, and 2 years ago that week, along with a link to the corresponding survey. Participant email addresses were obtained from a database, where course providers upload student rosters no more than 6 weeks after a course takes place. Using this email marketing platform allows researchers to monitor the email invitations' open rates and click rates. From December 2022 to June 2023, three follow-up reminder emails were sent to students who had already received the survey link: once in February, March, and again in April.

The survey response rates for Winter 2022-23 were as follows: for the 6-week period, 608 out of 9,753 respondents participated, representing a response rate of 6.23%. For the 1-year interval, 644 out of 10,931 respondents participated, resulting in a response rate of 5.89%. In regards to the 2-year survey, 441 out of 14,013 respondents participated, yielding a response rate of 3.15% *(see Table 2)*. All surveys were anonymous and confidential. Students who only answered demographic questions were excluded from the analysis, as they stopped filling out the survey after Question 13 and provided no responses for questions examining backcountry behaviors and the use of avalanche forecasting.

Table 2: Response rates for participants.

	RESPONSES	WINTER	RESPONSE RATE	MEAN WKS	CLEANED	TOTAL RESPONSE ANALYZED
	N	Year	Total (%)	Weeks	Deleted	N
6-WEEK	608	2022-2023	608/9753 (6.23%)	6.18	112	496
1-YEAR	644	2021-2022	644/10,931 (5.89%)	58.16	94	550
2-YEAR	441	2020-2021	441/14,013 (3.15%)	109.99	63	378

2.4 Analysis

All statistical analyses were performed using SPSS. Descriptive statistics were employed to determine the frequency of survey sample group demographics and group dynamics for the three survey groups, 6 weeks, 1 year, and 2 years. A retrospective pretest-posttest of participant behaviors in the backcountry prior to and following completion of the course for each survey group was conducted using a Mann-Whitney U analysis. Chi-square analyses were employed to examine response rates of incidents and near misses for each survey group. An alpha of 0.05 was set for tests with a $p<0.05$ determining significance.

3. RESULTS

3.1 Demographics

A chi-square Goodness of Fit test was used to examine if survey sample groups were proportionally similar to the total population of AIARE course participants (*see Table 3*). This was determined by the number of people who responded to the demographic survey in the pre-course online learning portion of their courses during Winter 2022–23. No significant differences in population demographics (Mode of

Travel and Gender Identity) were found for Group 1 (p>0.05), Group 2 (p>0.05), or Group 3 (p>0.05) when compared to the total population. The mean age of all student participants is 42 years old, with the majority of students having spent 2 to 5 winters in the backcountry (all students = 44.89%, Group 1 = 48.99%, Group 2 = 67.45%, Group 3 = 75.40%). The sample is composed of mostly males (all students = 64.21%, Group 1 = 67.03%, Group 2 = 67.03%, Group 3 = 66.40%). The majority of participants used skis as their mode of travel (all students = 62.21%, Group 1 = 65.38%, Group 2 = 64.91%, Group 3 = 71.96%).

Table 3: Demographic information of all AIARE Level 1 students for Winter 2022–23 and for all three survey sample groups.

	All Students (n=8222)		*Group 1 (n=496)*		*Group 2 (n=550)*		*Group 3 (n=378)*	
	Total	%	Total	%	Total	%	Total	%
Mode of Travel								
Ski	5279	64.21%	325	65.52%	357	64.91%	272	71.96%
Snowboard	1700	20.68%	96	19.35%	125	22.73%	69	18.25%
Ice climb/Alpine climb	153	1.86%	0	0.00%	0	0.00%	0	0.00%
Nordic/Cross Country Ski	68	0.83%	3	0.61%	1	0.00%	1	0.26%
Snowshoe/hiking	615	7.48%	49	9.88%	42	7.64%	20	5.29%
Snowmobile	319	3.88%	22	4.44%	21	3.82%	15	3.97%
Snow bike	10	0.00%	0	0.00%	0	0.00%	0	0.00%
Winters in the backcountry								
First winter	2401	29.20%	142	28.62%	68	12.36%	9	2.38%
2-5 winters	3691	44.89%	243	48.99%	371	67.45%	286	75.40%
6-10 winters	825	10.03%	37	7.46%	60	10.91%	41	10.85%
11-20 winters	629	7.65%	33	6.65%	25	4.55%	19	5.03%
20+ winters	549	6.68%	40	8.06%	26	4.73%	23	6.08%
Days per Winter								
0 days	-	-	22	4.40%	8	1.50%	3	0.80%
1-5 days	3099	37.69%	183	36.90%	165	30.00%	109	28.80%
6-10 days	1985	24.14%	146	29.40%	167	30.40%	104	27.50%
11-20 days	1347	16.38%	93	18.80%	123	22.30%	90	23.90%
20+ days	1559	18.96%	51	10.30%	86	15.60%	72	19%
Gender Identity								
Woman	2642	32.13%	155	31.25%	172	31.33%	119	31.48%
Man	5258	63.95%	330	66.53%	368	67.03%	251	66.40%
Non-binary	48	0.58%	4	8.06%	2	0.36%	4	1.06%
I prefer not to answer	107	1.30%	7	1.42%	6	1.09%	3	0.79%
I prefer to self-describe	0	0.00%	-	-	1	0.18%	0	0.00%
Age								
Under 18	-	-	9	1.80%	10	1.80%	1	0.30%
18-24	-	-	49	9.90%	54	9.80%	15	4%
25-34	-	-	215	43.30%	240	43.60%	173	45.80%
35-44	-	-	116	23.40%	124	22.50%	82	21.70%
45-54	-	-	59	11.90%	64	11.60%	65	17.20%
55-64	-	-	40	8.10%	46	8.40%	32	8.50%
65+	-	-	8	1.60%	12	2.20%	8	2.10%

3.2 Avalanche Rescue Practice

The majority of participants practiced rescue 1–2 times post course with essential avalanche rescue gear (Group 1 = 47.58%, Group 2 = 61.09%, Group 3 = 57.67%*; See Figure 1*), ran through a scenario (Group 1 = 43.95%, Group 2 = 50.73%%, Group 3 = 49.21%; *See Figure 2*) and practiced with backcountry (Group 1 = 47.56%, Group 2 = 57.64%, Group 3 = 54.23%; *See Figure 3*). Most students reported they did not time any of their rescue practice (Group 1 = 59.68%, Group 2 =60.00%, Group 3 = 52.91%; *See Figure 4*) The majority of all participants either practiced rescue not at all or 1-2 times post course regardless of how long it had been since the course. Most participants do not time avalanche practice.

Figure 1: Post-course avalanche rescue practice with essential rescue gear

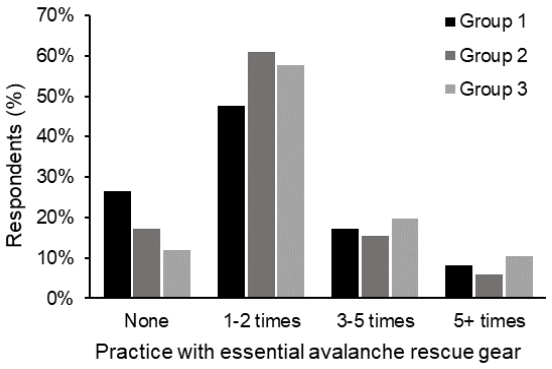


Figure 2: Post-course avalanche rescue practice run through a scenario

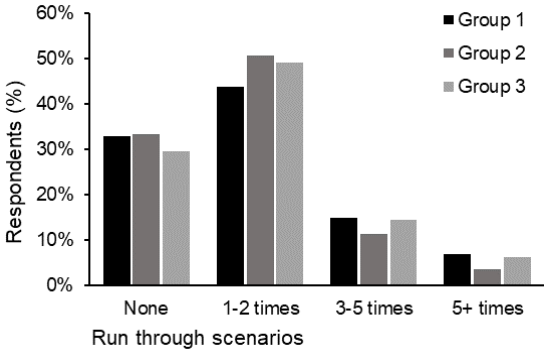


Figure 3: Post-course avalanche rescue practice with partners

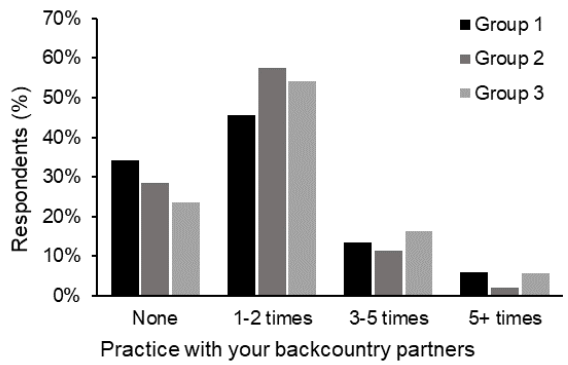
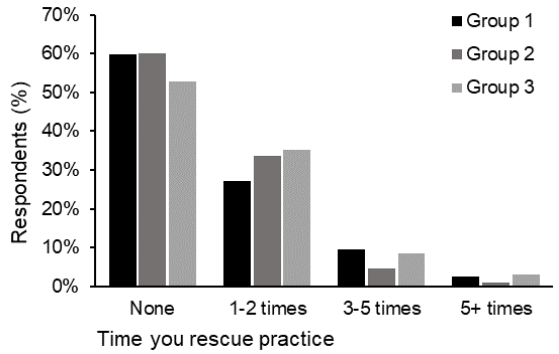


Figure 4: Post-course avalanche rescue timed practice



3.3 Backcountry Behaviors

Participants were asked to report their perceptions of their own behaviors before and after their recreational courses, with a particular focus on before leaving a trailhead, planning a backcountry trip and during backcountry travel.

3.3.1 Behaviors before and after leaving the trailhead

A 5-point Likert scale of never (1), rarely (2), before most trips (3), before every trip (4), and before every trip and sometimes in between (5) was used to assess frequency. Participants in each of the survey groups reported a statistically significant increase in perception of frequency in all categories of behaviors at $p < 0.001$ (see *Table 4).* Participants perceived they checked transmit mode and search mode with the transceiver more often after the course than before. They also reported they checked to make sure everyone had a shovel and probe and that they were in working order more often after the course. Checking for communication gear (cell phones, satellite communication devices), reviewing an emergency plan and telling someone where you were going were all reported as more frequent after the course than before.

Table 4: Behaviors before leaving the trailhead, before and after taking a recreation avalanche course

Before leaving the trailhead		*Before*			*After*		
		N	Mean (Std)	Mean Rank	N	Mean (Std)	Mean Rank
Check transmit mode of transceivers	Group 1	482	3.09(1.38)	389.21	485	4.05(0.73)	578.2*
	Group 2	535	3.07(1.35)	437.22	543	4(0.83)	640.27*
	Group 3	364	2.95(1.32)	285.65	375	3.99(0.68)	451.88*
Check search mode of transceivers	Group 1	480	2.96(1.4)	383.7	484	3.99(0.77)	580.49*
	Group 2	534	2.91(1.36)	432.3	543	3.88(0.87)	643.93*
	Group 3	363	2.84(1.34)	284.51	375	3.91(0.73)	451.77*
Check probe and shovel	Group 1	481	2.65(1.32)	384.39	484	3.62(0.96)	581*
	Group 2	536	2.58(1.28)	426.6	544	3.54(0.95)	652.72*
	Group 3	365	2.44(1.24)	292.91	376	3.38(1.04)	446.8*
Check communication gear	Group 1	479	2.7(1.29)	393.7	483	3.54(1.08)	568.58*
	Group 2	534	2.63(1.33)	442.43	540	3.46(1.01)	631.51*
	Group 3	364	2.59(1.22)	305.91	376	3.34(1.11)	433.03*
Review emergency plan	Group 1	482	2.41(1.22)	359.56	485	3.55(0.96)	607.67*
	Group 2	536	2.41(1.14)	406.54	542	3.44(0.97)	670.99*
	Group 3	365	2.33(1.06)	282.36	376	3.26(0.96)	457.05*
Tell someone where you are going	Group 1	484	3.55(0.98)	437.43	488	3.9(0.73)	535.17*
	Group 2	538	3.47(1.01)	476.93	545	3.89(0.75)	606.24*
	Group 3	366	3.38(0.99)	332.04	376	3.76(0.77)	409.91*

*significant difference (p<0.001) in behaviors before to after taking the course

3.3.2 Behaviors before and after when planning a backcountry trip

A 5-point Likert scale of never (1), rarely (2), ahead of most trips (3), ahead of every trip (4), ahead of every trip and sometimes in between (5), and every day during the winter (6) was used to assess the perceived frequency of behaviors. Participants in each of the time frames reported a statistically significant increase in perception of frequency in all categories of behaviors at $p < 0.001$ (*see Table 5).* Participants perceived they checked the weather and checked the avalanche forecast more often after they took an avalanche course than before. They also reported they developed a plan and used maps more frequently post-course than before.

Table 5: Behaviors when planning a backcountry trip, before and after taking a recreation avalanche course

Planning Backcountry trip		*Before*			*After*		
		N	Mean (Std)	Mean Rank	N	Mean (Std)	Mean Rank
Check the weather	Group 1	487	4.18(1.17)	389.56	490	5(0.85)	587.84*
	Group 2	539	4.08(1.29)	417.04	545	5.1(0.84)	666.58*
	Group 3	367	4.04(1.27)	284.63	374	5.05(0.89)	455.76*
Check the avalanche forecast	Group 1	484	3.39(1.5)	340.26	490	4.95(0.82)	632.93*
	Group 2	537	3.36(1.56)	377.9	546	5(0.87)	703.39*
	Group 3	365	3.5(1.51)	260.93	374	5.04(0.9)	476.45*
Develop a travel plan	Group 1	486	3.23(1.34)	357.08	488	4.45(0.82)	617.39*
	Group 2	534	3.2(1.31)	395.19	542	4.39(0.92)	679.7*
	Group 3	365	3.17(1.28)	268.4	375	4.38(0.87)	469.88*
Use maps	Group 1	485	3.03(1.37)	365.04	488	4.21(0.92)	608.21*
	Group 2	535	2.94(1.4)	408.33	542	4.11(1.05)	667.98*
	Group 3	366	3.05(1.36)	282.33	374	4.16(1.03)	456.78*

*significant difference (p<0.001) in behaviors before to after taking the course

3.3.3 Behaviors before and after when traveling in the backcountry

A 5-point Likert scale of never (1), rarely (2), during most trips (3), during every trip (4), during every trip and sometimes in between (5), and every day of the winter (6) was used to assess the perceived frequency of behaviors. Participants in each of the time frames reported a statistically significant increase in perception of frequency in all categories of behaviors at $p < 0.001$. (*See Table 6.*) Participants perceived they ruled out specific routes and zones when traveling in the backcountry post course. They also reported they chose travel techniques to reduce avalanche exposure, noticed signs of unstable conditions, and were more likely to review decisions at the end of the day than they were before the course.

Table 6: Behaviors when traveling in the backcountry, before and after taking a recreation avalanche course.

Traveling in Backcountry		*Before*			*After*		
		N	Mean (Std)	Mean Rank	N	Mean (Std)	Mean Rank
Rule out specific routes or zones	Group 1	479	3.01(1.3)	343.22	481	4.31(0.84)	617.21*
	Group 2	532	2.99(1.35)	387.54	541	4.26(0.81)	683.98*
	Group 3	364	2.97(1.26)	259.23	373	428(0.9)	476.12*
Chose travel techniques to reduce avalanche exposure	Group 1	478	3.03(1.27)	338.32	481	4.33(0.79)	620.8*
	Group 2	531	2.94(1.33)	379.58	541	4.25(0.8)	690.52*
	Group 3	362	2.92(1.22)	252.15	372	4.26(0.86)	479.75*
Notice signs of unstable conditions	Group 1	478	2.53(1.19)	319.87	480	4.07(0.97)	638.47*
	Group 2	532	2.43(1.14)	349.87	540	4.03(1.03)	720.36*
	Group 3	363	2.37(1.07)	232.32	372	4.08(1.08)	500.4*
Review decisions at the end of the day	Group 1	479	2.26(1.21)	318	479	3.82(0.97)	641*
	Group 2	528	2.17(1.15)	352.27	536	3.64(0.99)	710.04*
	Group 3	362	2.15(1.16)	248.45	371	3.55(1.11)	482.67*

*significant difference (p<0.001) in behaviors before to after taking the course

4. DISCUSSION

The current study assessed winter backcountry travel behaviors at 6 weeks, 1 year, and 2 years after the completion of a recreational avalanche course. The majority of participants taking a recreational avalanche have spent 2–5 winters in the backcountry. This holds true for all groups at different timeframes. This could indicate that the majority of those taking the course are doing so as they are getting into the activity. Most of the individuals taking recreation avalanche courses are males and use skis as their mode of travel. The information helps to understand who is taking a course and can help guide avalanche educators to develop outreach to different user groups and genders.

The majority of participants reported that they practiced with essential avalanche gear, ran through scenarios and practiced with backcountry partners 1-2 times after the course. However, there was still a number (20-30%) of participants who reported never doing those behaviors after the course. Those 1-2 years after the course still reported only practicing 1-2 times since the course. This is an area in which educators could focus marketing and education efforts to emphasize the importance of maintaining avalanche rescue skills through practice after the course.

Through the use of a retrospective pre-post survey, the study found that participants in each of the time frames reported an increase in perception of frequency in all categories of behaviors; trip planning, before leaving a trailhead, and during backcountry travel. Participants in recreation avalanche courses perceive they are more frequently performing specific behaviors that have been identified as important in backcountry travel. The information helps us to evaluate what students are taking away from the avalanche course and how it is affecting their perceived behaviors.

The study provides information that contributes to the understanding of the effectiveness of avalanche programming. The results indicate it is possible to understand an educational experience's impact on participants based on their perceived behaviors before and after a recreational course. The data acquired provides a baseline for understanding the impact of a 24-hour recreational avalanche course. This

presents opportunities to modify delivery methods or time frames in order to better understand how course structure can impact behavior change (for example, through greater adoption of behaviors or accessibility of courses).

4.1 Limitations

The study employed a retrospective pre-post test design that attempts to assess perceived changes resulting from program participation without collecting baseline data prior to program commencement. The research designs rely on recall of the behaviors or knowledge before and after the intervention. Researchers must try to minimize the effort on the participant for memory-related problems (Pratt et al., 2000). The students in the course were asked about specific behaviors, not changes in knowledge using a defined event and time period.

Retrospective pre-post designs are self-reported and are based on the participant's perceptions of their behaviors before and after the course. No objective measure of behaviors is observed with this study design, only the participants' perceptions.

Participants may exhibit a subject bias since they signed up for an avalanche course and are actively trying to improve their skills (Pratt et al., 2000). The advantage of the retrospective design is that it provides a measure of the participant's behavior prior to the start of the course; it can help refocus the participant by providing a point of reference (Ary, Jacobs, Razavieh, & Sorensen, 2006). By comparing current behaviors to behaviors before the course, the design can offer a more accurate measure of change than solely inquiring about participants' perceptions of change after the course.

The survey was sent out to all participants who had taken a recreation avalanche course. The study had a low response rate. Those who were more interested and may have had a more positive experience with the avalanche course may have been more likely to fill out the survey.

Collecting more data over time will help to understand what participants retain over a longer time period, as well as what factors might influence behavior retention (such as the number of years since the last time a participant received formal education or the format and length of that educational experience).

The results of this study also prompt further questions about the effectiveness of recreational avalanche education. For example, which specific topics or lessons within a 24-hour course were the most effective at engendering the perceived changes in behavior? What is the most effective delivery method for those topics or lessons? What level of change, real or perceived, is a realistic target for the 24-hour course format? Little research has been conducted on the efficacy of the three-day format specifically with the unique constraints of avalanche education.

5. CONCLUSIONS

Results from the study help to understand who is taking avalanche education courses, as well as, course participant behaviors 6 weeks, 1 year, and 2 years after completion of a recreation course.

This understanding can enable educators, forecasters, practitioners, and researchers to gain insight into the backcountry behaviors of avalanche course participants and allow us to further develop and improve risk management curricula and interventions in response.

Results from this ongoing study help to understand the demographics of who is taking recreational avalanche education courses, who continues to engage in backcountry travel after a course, and course participant behaviors 6 weeks, 1 year, and 2 years after a course. This understanding helps curriculum and instructional designers, as well as educators, understand which of the behaviors and activities students perceive they are doing more frequently after the course than before. This information impacts the methods the avalanche safety community employs in an attempt to influence safe behavior in the winter backcountry. It can also provide educators, forecasters, practitioners, and researchers with insight into the backcountry behaviors of avalanche course participants, and allow for the development and improvement of

risk-management curricula and interventions in response.

CONFLICT OF INTEREST

This study was funded in part by AIARE.

ACKNOWLEDGEMENTS

We would like to thank AIARE for their support of and contribution to this study. AIARE is a nonprofit organization that is committed to continually evaluating the quality of its curricula and programming, and to collaborating with other avalanche professionals from across the industry as well as those in other disciplines.

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