SURVEY OF MOUNTAIN BEHAVIOR AND PERCEPTION OF AVALANCHE RISK IN ANDORRA (EASTERN PYRENEES)

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ABSTRACT: A survey of people's behaviour in mountain habitats and their perception of avalanche risk, aimed at people who practice winter sports, was carried out in Andorra. It had several objectives in mind: on one hand, it hoped to identify which groups of people practice winter sports in Andorra and, on the other, to compare the behaviour of people who have followed training programmes and those who have not as a means of evaluating the impact of these courses. The survey had a common defined part that was completed by both types of sportspeople, i.e. those who have completed some kind of training course and those who have not. The rest of the survey differed for each group. For those who have carried out no type of training course related to snow or avalanches, special emphasis was placed on their perception of risk. For people who have followed a training program, similar questions were asked in order to compare changes in risk perception between these two groups. This latter group, however, was also asked questions relating to more specific subjects such as their ability to recognise weak layers in the snowpack. In the final section, respondents were asked about their safety habits, including, for example, their reading of avalanche warning bulletins and weather forecasts. In this section, we also compared the safety habits of people with and without specific training formation in snow science, avalanches and rescue.

KEYWORDS: risk perception; training; safety habitudes.

1. INTRODUCTION

In 2009, three Andorran official institutions (the Snow and Mountain Research Center of Andorra, the Rescue Mountain Team of Andorra (GRM) and the Andorran Mountain School) began to collaborate on the creation of a non-profit training space in which snow and weather science, practical mountain knowledge and rescue skills could be merged to provide safety tools for people who practice winter mountain sports. The communication channels between these three institutions work on a number of different levels: three levels of avalanche training courses, a web page with concepts and advice, periodical conferences for all audiences, the publication of brochures and guides, a DVA park, etc.

After nine years of training experiences, we performed a survey in Andorra. The survey was designed in a Google Forms environment and was launched via different social networks and sent out to the mountain clubs and ski clubs of Andorra and the Andorran Mountain Federation.

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The survey had three main sections. The first corresponds to personal data such as gender, age, years of experience in mountain sports, activities practiced, frequency in which they practice winter sports, and level of training in avalanche and winter rescue. The second section corresponds to prevention of avalanche accidents, and the third to risk perception. Although the survey had several questions in each section, we only present here the most significant results.

2. SAMPLE

Of the 218 answers received, 54 were rejected as they were from people who practice snow sports on ski slopes (without going off-piste) or snowshoers who do not enter alpine habitats. Thus, the final sample consisted of 166 people.

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3. RESULTS

3.1 Training

The first separation was based on the training level, which was split into 3 levels: a) People with no specific training on snow or in winter rescue (WT); b) People with basic training on snow and in winter rescue; and c) people with advanced training or professional training in snow and winter rescue.

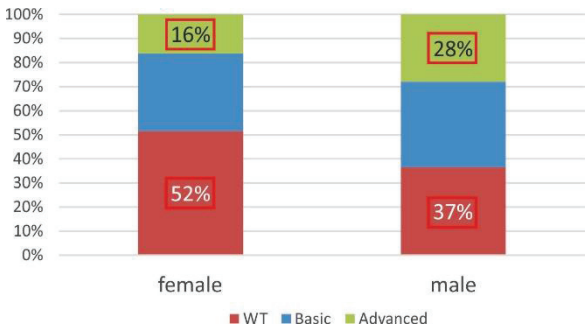

Figure 1. Level of training by gender.

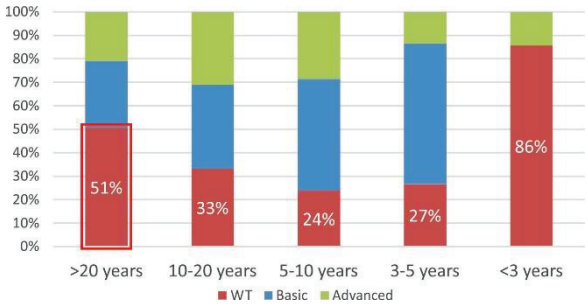

Figure 2. Level of training by years of experience.

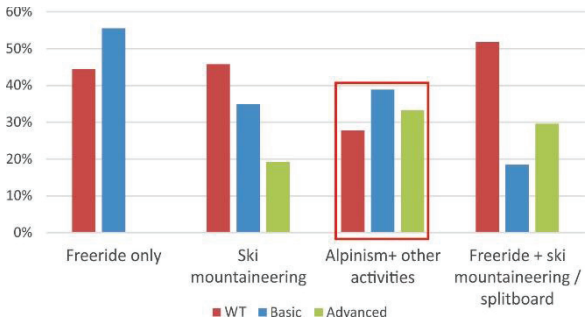

Figure 3. Level of training by activities.

In terms of gender, in general men have more advanced training than women. Half of the women replied that they had no training, 15% more than in men (Fig. 1).

In all, 50% of respondents with more than 20 years of experience in winter sports affirm they have never followed any training course related to snow or winter rescue (Fig. 2).

We observed that people practicing alpinism have a higher level of training than people who do not practice alpine activities (Fig. 3).

We did not observe any relationship between training level, age and the frequency with which respondents practiced winter sports.

3.2 Equipment

The higher the level of training, the greater the percentage of people who have rescue equipment. It should be noted that only 40% of respondents that have not followed any training course carry a transceiver (Fig. 4).

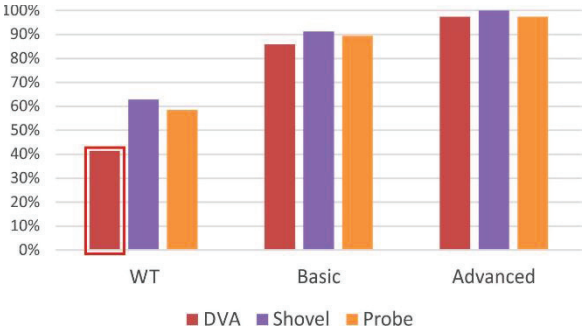

Figure 4. Rescue equipment vs level of training.

Figure 5 shows the percentage of people who purchased rescue material after attending training courses. Thus, 59% of the respondents who did not have a transceiver before a training programme, bought one subsequently, 76% bought a shovel and 70% a probe.

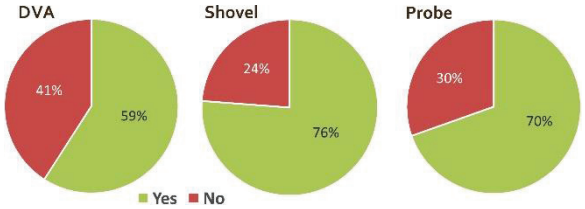

Figure 5. Percentage of people who purchased rescue material after attending training courses.

We did not find any significant relationship between age, frequency or years of mountain experience and the possession of rescue equipment.

3.3 Preparing the trip

One of the goals of our training courses was to raise awareness of the importance of preventing accidents by preparing correctly for an

excursion. Thus, we analyzed the use of cartographic tools such as maps or GPS, and the reading of weather and avalanche forecasts. The most-used cartographic tools in all three collectives were maps and apps. It is noticeable that 23% of the respondents who have not followed a training programme also state that they do not use any cartographic tool. It is also interesting to note that most people use more than one cartographic tool.

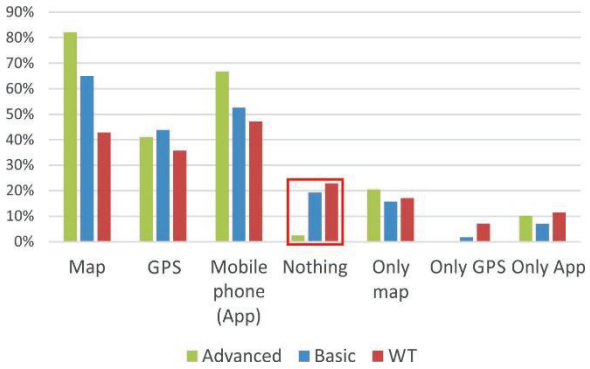

Figure 6. Use of cartographic tools.

We observed an increase in the reading of avalanche bulletins in people who have followed a training programme (Fig. 7). Almost 100% of respondents check the weather forecast, regardless of their level of training.

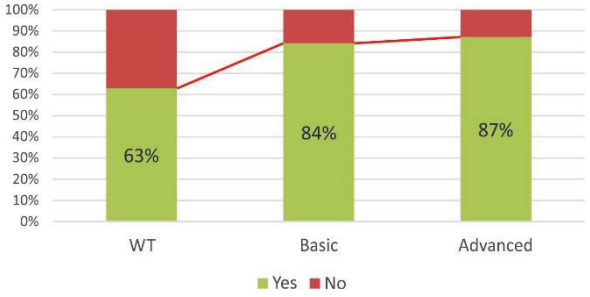

Figure 7. Use of avalanche bulletin.

In terms of rescue material, only 31% of respondents who have not undertaken any training courses affirm they practice using a transceiver during the season; this percentage increases to 69% in people with advanced levels of training (Fig. 8).

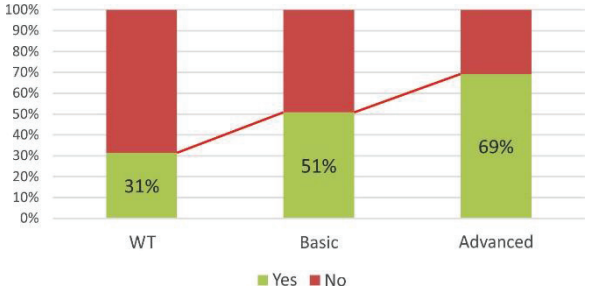

Figure 8. Rescue practices during the season.

To the question “If your group were caught in an avalanche, do you think you could organize the rescue?”, only 49% of respondents without any training answered yes; this number increased to 95% in people with advanced training (Fig. 9).

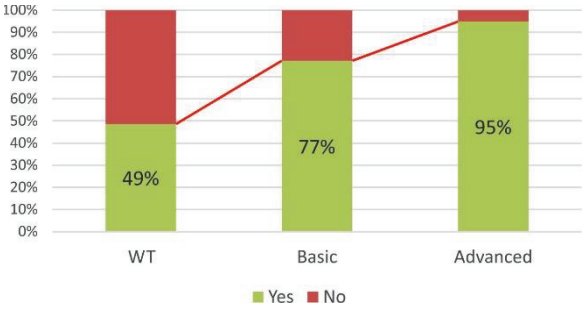

Figure 9. Perception of the ability to organize a rescue.

We did not find any significant relationship between these examples and age, frequency or years of mountain experience.

3.4 Risk perception

We asked respondents to evaluate on a scale of 1 to 5 their level of confidence regarding their knowledge of avalanche risk. We observed that the level of confidence is generally higher in men than in women, and that it also increases in people with higher training levels (Figs. 10, 11).

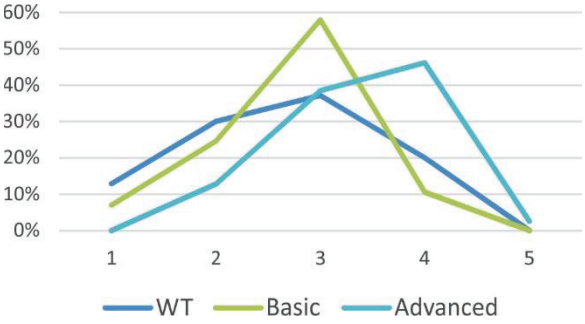

Figure 10. Confidence in knowledge of avalanche risk in terms of training level.

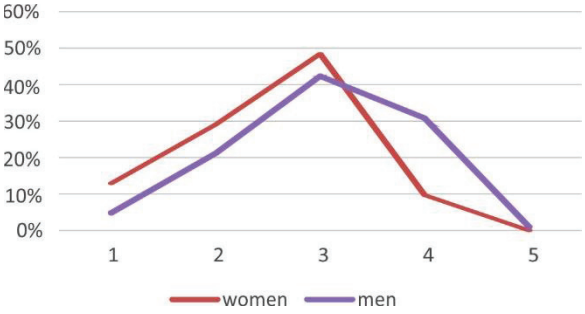

Figure 11. Confidence in knowledge of avalanche risk in terms of gender.

However, when they had to choose a sentence that described their behavior, we did not find any significant relationship between answers and any of the variables analyzed (gender, age, frequency, experience, training level and activity) (Fig. 12).

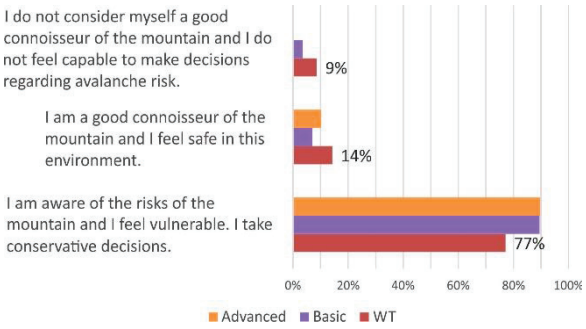

Figure 12. Perception of risk and behaviour in terms of level of training.

Finally, we asked the people who have followed a training programme how their perception of risk changed after the course. Most now feel more vulnerable, while 44% feel safer (Fig. 13).

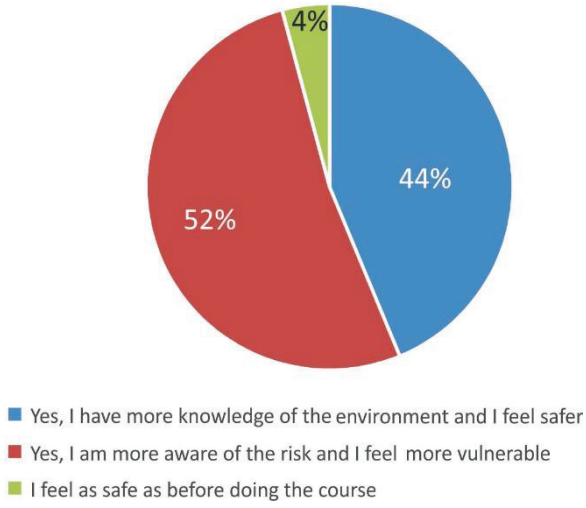

Figure 13. Answers to the question “Did your perception of risk change after the training course?”

4. CONCLUSIONS

The answers obtained in the survey suggest the following:

People with specific training on avalanches and rescue are better prepared when in the mountains: a higher percentage have safety equipment, they are better equipped, make more use of cartographic tools, check the avalanche forecast more often, undertake more rescue practice during the season, and feel better prepared to organize a group rescue. The higher the level of training, the better people prepare their excursions.

There is a significant increase in the acquisition of rescue equipment after attending training courses.

In terms of the perception of risk, the best trained people tend to rely most on their knowledge, although this does not imply that they take riskier choices than those who are not trained.

These data reveal the importance of continuous training in people who practice winter sports. With basic training, people are made more aware (for example, the acquisition of rescue equipment), although it seems that only with advanced training do people feel really capable of taking decisions and acting according to established protocols.

Finally, efforts must be made to involve certain specific groups such as women and people with many years of experience; as well, it is important to offer advanced training to groups of freeriders.

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