# Editor

Dear Editor,

Thank you very much for the positive and very thoughtful review of our manuscript. We appreciate a lot the reviewers’ comments and suggestions to improve our manuscript. We incorporated them in the revised text.

Please find below the point-to-point response to the reviewers’ issues. Since the reviewers requested more information and literature evidence, we also deleted few less important references from the initial submission to keep the bibliography within reasonable limits. Additionally, some minor copyediting was done.

We hope that the manuscript is now be suitable for publication in European Archives of Psychiatry and Clinical Neuroscience.

Thank you,

Katharina Hüfner

# Reviewer 1

## **Point** 1

Three distinct patterns of mental health response following accidents in mountain sports – a follow-up study of individuals treated at a tertiary trauma center

Summary: the study provides the first data on mental healthy consequences of alpine sport accidents. The topic is of high interest specifically of the medical specialists of the alpine region countries. The study design is sound and the methods a highly innovative. Overall I recommend publishing this interesting data.

## **Response 1**

Thank you for the constructive feedback and the overall positive assessment of our study.

## **Point** 2

**Abstract**: The abstract is well structured. Probably it might be better not to make the first sentence about a topic which the study does not cover (positive effects of mountain sports).

## Response 2

We agree that the first sentence of the introduction does not specifically relate to the subject of our research, which concerns primarily negative psycho-pathological burden of mountain sport accidents.

We changed this sentence of **Abstract** attempting to accommodate the reviewer´s concern but did not completely remove it because we feel that especially “mountain sports” are generally believed to bolster mental health. Additionally, individuals performing mountain sports are often portrayed as resilient personalities protected from mental disorders. In our clinical practice, these beliefs are a common source of stigma in members of the mountaineering community. So I hope this makes it more clear why we did not remove the first sentence completely and hopefully the reviewer can understand your intentions.

## Point 3

**Introduction**: The introduction is well written At the end I think it would help to make the hypothesis more clear. I know that with SVM methods a hypothesis free approach is common, however the authors intend to (1) categorise the sample (2) find predictors.

## Response 3

Thank you for this suggestion. In the last paragraph of **Introduction**, we stressed the exploratory character of the study and the general strategy consisting of classification of participants by their mental health state followed by a search for predictors of mental health alterations.

## **Point 4**

Methods The methods are highly interesting and - as far as I can judge - are sound. Sample: The authors clearly state the problem of the low response rate of about 6%. There is a clear bias, however studies indicate that in mental health normally prevalences are under reported not overestimated.

## **Response 4**

We absolutely agree with your comment that the low response rate is a source of bias. Unfortunately this is a challenge observed in many studies tackling with mental disorders such as PTSD, anxiety and depression.

To assess the potential effects of the low response rate on the study outcome we included an extensive comparison of the analysis cohort with invited individuals, and participants excluded due to incomplete psychometric data in the initial submission.

In the revised manuscript we investigated the potential selection bias in even more detail, by comparing characteristic of the mountain sport accident in the study cohort with a nation-wide collective of Austrian mountain accident victims. Results of this analysis are presented in **Supplementary Figure 1** and described in **Results/Characteristic of the study cohort**. They indicate significantly higher frequency of winter sport accidents in the study cohorts than in the Austrian data set. Yet the effect size of the difference was very small (Cramer’s V ≤ 0.069), which lets us conclude that the bias of the study cohort concerning the sport type and accident time profile was still within acceptable range.

Since Reviewer 2 suggests the prevalences might be OVER reported we now specifically address this issue in more detail in the limitations section and cite relevant literature. This will make it possible for the reader to judge for themselves how to interpret the data.

## **Point 5**

Discussion: The discussion is well structured: Probably it would help if you’d point out your own findings at the beginning of each paragraph

## **Point** 4

Thank you for your suggestion. We summarize our most important findings in the beginning of the Discussion (first paragraph) were we have added some information to make this clearer. Were appropriate we have now also added additional summaries at the beginning of the paragraphs in the discussion section.

## **Concern 5**

Line 51: The think the study was performed at the University of Grenoble which is in France not Switzerland

## **Response 5**

How embarrassing, thank you for pointing this mistake out so we could correct it.

## **Concern 6**

Throughout the discussion: Please find a clear terminology of the PTSD: sometimes you talk about manifest PTSD sometimes about PTSD symptoms. As you mostly do refer to symptoms of PTSD I’d stick with that.

## **Response 6**

This is indeed difficult. We speak of “Symptoms of PTSD” when only symptoms were reported (operationalized as at least one positive PCL-5 cluster in our study), we speak of “Diagnosis of PTSD” when all criteria for PTSD were present or a formal clinical diagnosis was made. This was not completely coherent in the text. We appologize. We have double checked the text and remove text passages were the use was incorrect. Also we now clearly state in the Methods and results section how we operationalize Symptoms of PTSD in our cohort. Thank you!

## **Concern 7**

Figures: The figures a very clear and have a nice layout. Congrats

## **Response 7**

Thank you very much.

# Reviewer 2

## Point 8

This paper aims at characterizing mental health in persons after mountain sport accidents. This is an interesting question approached with a very transparent and accessibly documented analysis.

## Response 8

Thank you.

## Point 9

I would almost certainly expect there to be a strong self-selection bias in the obtained responses to your survey (i.e., those still dealing with the consequences of their accident), likely overestimating the prevalence of mental health-related impairment in these individuals. In addition, the supplementary table S4 shows that respondents had more severe injuries requiring hospitalization and surgery compared to non-respondents, also reflecting self-selection of particularly affected individuals among those who experienced a mountaineering accident. Does that change the implication(s) of your results?

## **Response 9**

We absolutely agree that there is a selection bias in this study. This was already pointed out in the limitations section of the first version of the manuscript. Reviewer 1 suggested that symptoms might be underreported due to the selection bias. While we cannot exclude one or the other we take your valid concerns into account and have added more information on this topic in the limitations section and also now cite relevant literature there. In accordance with your comment we alert readers to interpret the results with caution due to the possible selection bias and low response rate.

## **Point 10**

Respondents completed the survey after about 3.5 years (median) after their accident. This seems like a long time, how certain are you that any mental health-related burden is still due to the accident? Did you screen for any events that might have happened in the meantime? The addition of a control group (without a mountain sport accident) may be considered - could you point out how the PTSD symptom rates obtained in this study compare to those in the general population (page 13, lines 4-9?), taking into account the self-selection bias mentioned above? What does this mean for the interpretation of your results?

## **Response 10**

We collected

## **Point 11**

According to your statement on page 13 (lines 4-9), it seems that your sample was especially resilient compared to the general population. Wouldn't this perhaps imply a protective factor of (mountain) sports overall, despite accident risk?

## **Response 11**

absolutely! We make this more clear now in the Discussion section to emphazise this point.

## **Point 12**

Please describe more clearly which results were significant and which were not. Non-significant results should be clearly labelled as such and not paraphrased as "enriched in" or a "tendency". In lines 33-56 (page 10) and lines 4-16 (page 11), it was very difficult to discern which group differences were significant and which were not (see also minor points below)

## Response 12

This was corrected.

## **Concern 13**

What new insights does this study offer? Pre-existing mental disorders and persistent somatic symptoms are well-known risk factors for the development of psychiatric disorders. Indeed, a reliable model identifying at-risk individuals would have been interesting, but this study could not provide one.

## **Response 13**

The main new data of this study concern the specific investigation of individuals performing mountain sports. These individuals are by many regarded as being exceptionally hardened and healthy. In part this is confirmed by our study because we show that participants were quite resilient, on the ot her hand it is important to keep in mind that also very “healthy and heardend” appearing individuals can suffer from PTSD or other mental health consequences of an accident. We have emphasized this in the conclusion to be more clear.

## **Concern 14**

Why was residence in a German-speaking country required, when German-speaking proficiency was already an inclusion criterion?

## **Response 14**

This had to do with the way participants were recruited. We selected the potential participants from a clinical database and in a first step contacted individuals leaving in a German speaking region. However, we then also asked the participants whether they are proficient in German because theoretically a person originally from Spain who does not speak any German could have an address in Munich, Germany but not speak any German.

## **Concern 15**

Why do you think did 20% of respondents not complete the survey? Why did they send back an incomplete battery?

## **Response 15**

from our experience this is the normal “drop out” rate, especially in longer surveys or such covering difficult topics such as mental health, we observe this in other studies as well.

## **Concern 16**

You report that 38% of respondents already had another mountain sport accident in the past. This number seems rather high at first sight- is there any data of the typical accident prevalence in this sport available? Are these high risk-taking individuals?

## Response 16

Rather normal?

## **Concern 17**

Page 10, lines 35-37 "substantially enriched in… […]; these effects were not significant" and page 10, lines 39-41 (frequency of higher traumatic events): I would not point out any apparent differences that are not statistically significant.

## **Response 17**

as stated above, was all rephrased according to your comment.

## **Concern 18**

Page 10, line 43 - 48: Do not describe mean differences as "enriched in" if they are not statistically significant, as this could confuse the reader and possibly convey false information on group differences.

## **Response 18**

ok ;-) done

## **Concern 19**

Will the data be made openly accessible? This would be desirable.

## Response 19

unfortunately our ethics committee did not agree to this.

# References