DIFFICULTIES & METHODS IN EXTREME SPORTS MEDICINE RESEARCH

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1. MOTIVATION

2. METHODS

3. EXTREME ENVIRONMENTS
   ▶ Number of variables

4. EXTREME PERFORMANCE

5. TECHNOLOGY

6. SPORT-SPECIFIC ASPECTS
   ▶ Assessment parameters
   ▶ Terminology
   ▶ Design of the studies
   ▶ Limitations of the studies
   ▶ Possible solutions

7. NON-COLLABORATION
   ▶ Cultural habits
   ▶ Legal implications
   ▶ Solutions

8. CONCLUSIONS
1. MOTIVATION

Extreme sports medical research encounters many difficulties and requires special methods.

• Some measurements may be particularly complex and it may be difficult to acquire data in remote and adverse environments.

• The assessment parameters and methods adopted in traditional sports may not be adequate for many extreme sports due to the many variables involved and the intermittent nature of these sports.

• Participants in extreme sports may be reluctant to take part in medical research because of their cultural conditioning.

2. METHODS

This lecture is a report of my own experience in this field and also includes some examples from existing literature.
Which are the main difficulties in medical research in extreme sports?
The first thing that springs to mind is environment-related problems.

• It may be difficult to acquire data in remote areas due to the difficulties in transporting the equipment.

• Specific problems may be encountered, such as how to protect the equipment in salt water.
• In extreme sports many environment-related variables (e.g. wind and waves) play an important role, they are difficult to measure, hard to predict and they often interact in different ways.

• In the case of wind, for example, it may be useful to measure a mean value, but the wind speed range is also important since the wind changes continuously and a single gust may cause an incident.

• Wind may also affect other parameters such as waves and the relationship between wind and wave height may be influenced by several factors including the depth of the sea, or features of the seabed, etc.

As a consequence all these elements and factors and how they interact must be considered.
 However extreme sports are not only about extreme environments. Measurement-taking may encounter other problems, because of the true nature of these sports.

• Athletes may be under pressure and this could cause bias in the measurements.

• Any interference with the athletes' actions, may affect their performance which may have required a lot of money, time and training.

• Taking measurements could be dangerous: try to imagine the effects of measuring equipment mounted on a wingsuit during proximity flight.
Technology may provide solutions.

Sometimes the required technology is not available and it needs to be developed.

Valsecchi measured whole body vibration in kitesurfing using a purposely designed measurement system; of course, he had to make the devices waterproof.

In their study “How dangerous is BASE jumping?” Soreide et al, reviewed records of 20,850 jumps from 1995 to 2005 at the Kjerag massif in the Lysefjorden (Rogaland county, Stavanger) on the south-western coast of Norway. Soreide K et al, J Trauma, 2007.

However, this location, despite being a world-renowned site for legal BASE jumping, it would not be representative of BASE jumping as a whole. Mei-Dan O, et al. Wilderness Environ Med, 2013.

In fact, the Kjerag jumping zone is relatively forgiving, being a 1,000m high cliff (about 3,300 feet) that allows jumpers to reach high airspeeds, stabilize their body position and move away from the wall before opening the canopy, with a clear landing area. Mei-Dan O. Adventure and Extreme Sports Injuries 2013.
6. SPORT-SPECIFIC ASPECTS

Assessment parameters

- Another aspect is that assessment parameters adopted in traditional sports may not be adequate for many extreme sports.

- For instance, the injury rate appraisal in terms of hours practiced may not be completely accurate since many of these sports are intermittent - the time in the field is not necessarily spent in action.

SUPing in Cape Verde. Surfing is a typical intermittent sport.

(Photo: Claudio Marosa; courtesy of Springer, Feletti F (Ed) Extreme Sports Medicine 2016)
While in traditional sports the injury rate is evaluated in terms of n. of injuries/1,000 hours of sport exposure, in some extreme sports different solutions are required - for example injuries/10,000 skydives or injuries/1,000 BASE jumps.

6. SPORT-SPECIFIC ASPECTS

Terminology

The use of “accident” and “incident”

- In many industries, government agencies, legal and scientific fields, the term "accident" is not used, or its use is debated, because it could imply that the event was unavoidable (i.e. a chance occurrence or an “act of God”) and therefore could not be prevented.

- However, in some extreme sports (e.g. aerial extreme sports, climbing, etc..) “accident” and “incident” are both currently used to mean different feature events with the aim to highlight such aspects that may practically affect risk management:
  - “accident” is often preferred for an event which actually results in unpleasant consequences such as material damages, injuries, illnesses or death;
  - “incident” more generically refers to an event which affects or may affect people’s safety, near misses included

- The possibility of using the term “accident”, should be considered in extreme sports medicine.

Pless and Hagel, J Epidemiol Community Health, 2005.
Pubmed search, April 2016.
We have said that extreme sports are intermittent activities. And in fact many surfers or kite-surfers spend their lives on a beach waiting for enough wind or surf. However a researcher probably can’t do the same.

• This is one of the reasons why studies on injuries in extreme sports are often retrospective or are based on self-reported data, or data collected by non-medical personnel.
6. SPORT-SPECIFIC ASPECTS

Limitations of the studies

- Retrospective studies are mainly prone to recall bias, potentially leading to incorrect conclusions about epidemiology.

- Data collected by non-medical personnel may be inaccurate both in terms of evaluation and classification.

- However, establishing a different system to collect medical data in these sports is particularly problematic due to the large number of intermittent participants, the fact that they practice in many different locations, and again only in specific weather conditions.
6. SPORT-SPECIFIC ASPECTS

Possible solutions

• A thorough understanding of the sports is essential.

• A decision could be taken to study a specific subdiscipline of the sport, a specific setting or a specific event.

Italian Kitebuggying-Championship, Monte Petrano (PU), Italy
7. NON-COLLABORATION

• Sports participants may be reluctant to take part in medical research because of their cultural habits.

• The fact is that some groups of extreme sports athletes don’t like to speak about injuries out of a sort of superstition since they are aware of the dangers of their sport.
7. NON-COLLABORATION

Cultural habits

A common reaction when you try to involve extreme sports participant in medical research is: “Your research is not necessary: I know exactly the risks of this sport, I can tell you them, so you can publish them and save your time!”

• Sometimes this is true.
• This is not evidence-based.
• Sometimes, however, participants are not aware of their sport's pitfalls.
Another reason which makes extreme sports medical research difficult is that some sports have legal implications.

For example BASE jumpers rarely obtain permission to perform their jumps from objects such as: tall buildings, towers, antennas, etc.

Participants may fear that analyzing the dangers of their sport may lead to new legal limitations.
7. NON-COLLABORATION

Solutions

Here, the best solution, is to be directly involved in the sport or to be assisted by somebody who is closely involved in this world such as a highly respected figure.
7. CONCLUSIONS

“Researching extreme sports requires thorough understanding of the activities, preferably from within, which also makes it easier to approach the right population and get their will and approval to collect and analyze unique data”.

Thanks for your attention!
ACKNOWLEDGEMENTS

Special thanks to Michael Clark/Red Bull Content Pool and Springer for allowing me to use their photos.

REFERENCES


