

Handgrip strength of skiers is not an ideal biomarker of a person's fitness

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Dear Editor,

We read with interest the article by Burtcher *et al.* on hand grip strength measured with a hand dynamometer at various locations along Tyrolean ski slopes in 757 recreational skiers compared to 1021 community residents.¹ Most of the male subjects and half of the female subjects had higher grip strength of the dominant hand compared to the control subjects.¹ The grip strength of the skiers decreased with age to a similar extent as that of the reference population. The relative grip strength correlated positively with physical activity and the number of skiing days per year and negatively with body weight.¹ It was concluded that hand grip strength is related to the type, amount and intensity of regular physical activity and that the results support recommendations for training or rehabilitation.¹ The study is noteworthy, but several points should be discussed.

The first point is that grip strength highly depends on the skier's ability and the difficulty of the slopes they are tackling. Variety skiers have to make more of an effort than skiers who only use blue slopes. The grip strength certainly also depends on the quality of the slopes; bumpy slopes are more demanding for the hand than carpet-smooth slopes. As these points were not included in the analysis, the results may be unreliable and could lead to misinterpretations.

The second point is that there may be a difference between recreational skiers who engage in additional recreational sports, physical activity or systematic training and those who only ski. As long as these additional factors that influence grip strength are not included in the analysis, the results remain biased and are not meaningful.

The third point is that the control group (community residents) was not precisely defined. The people forming the control group may have different physical conditions depending on their daily activities, occupation, frequency of leisure activities and hobbies. If the group of community residents includes locksmiths, construction workers and steel workers, the analysis will yield different results than if the control group includes warehouse workers, truck drivers, forklift drivers, or cab driv-

ers. Until the control groups are better defined and selected, the results obtained in comparison to skiers will remain questionable.

The fourth point is that the duration of skiing per year was also not well defined, because skiing is not the same as skiing. One can ski 2 hours per day or the whole day from the opening of the lifts to their closing. It is therefore advisable to include this duration of skiing per day in the analysis.

The fifth point is that grip strength can also depend heavily on a skier's state of health and therefore medical history. Skiers with chronic conditions, such as immunological, endocrinological or malignant diseases, may have different grip strengths depending on their general fitness.

The sixth point is that muscle strength also depends on current medications. Since several medications can be muscle toxic and potentially affect muscle architecture and performance, it would have been imperative to ask all participants about their current medications. How many of the included subjects were taking statins, anti-rheumatic or anti-inflammatory drugs such as D-penicillamine, chloroquine/hydroxychloroquine, colchicine, interferon, cyclosporine, glucocorticoids, Antiretroviral Therapy (ART), recreational drugs such as cocaine, heroin, amphetamine, PCP and ETOH cau, or procainamide, amiodarone or Epsilon-Aminocaproic Acid (EACA)?

The seventh point is that skiing is a sport that mainly involves the legs, so it would have been advisable to examine the lower limbs rather than the upper limbs.

In summary, grip strength depends on so many factors that a definitive conclusion can only be drawn when these factors are taken into account in the analysis.

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Handgrip strength of skiers

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Availability of data and material

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Conflict of interest

The author declares that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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