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Opinion

The Risk of CrossFit® Training: A Comprehensive Analysis

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Opinion

CrossFit® Training is often scrutinized as a type of exercise regimen that may lead to a high incidence of injuries. However, it is known that the factors contributing to injuries in any individual are related to genetic predisposition and are directly influenced by internal risk factors, such as non-modifiable factors (gender, age, and height), prior injuries, and modifiable factors (e.g., muscle strength and aerobic capacity). The application of training overload exposes practitioners to risks, with this overload being either potentiated or mitigated by fatigue (negative effect) and physical conditioning (positive effect). In addition to these factors, the avoidance of injuries is linked to improvements in modifiable factors, namely, enhanced muscle strength and/or aerobic conditioning. Nevertheless, there is a risk of injury in cases of accumulated training overload, especially in individuals with pre-existing injuries [1].

To minimize the risk of injury incidence, controlled training overload is a crucial safety factor. The likelihood of injury can be managed by prescribing and calculating the acute-to-chronic workload ratio. The optimal ratio, known as the "sweet spot," appears to fall between 0.8 and 1.4. Values above the sweet spot can become dangerous. In such cases, trainers can mitigate risks through thoughtful training load prescriptions. A search in the PubMed database at the present date reveals a minimum of 96 research studies related to CrossFit® and injury incidence. This indicates a growing interest in discussions aimed at demystifying and understanding how to work towards minimizing risks. Several authors report injury incidences in CrossFit® ranging from 11.2% to 38.5% [2-6]. These values are comparable to other physical activities such as running and gymnastics. Specifically, gymnastic movements and weightlifting are the ones that elevate injury incidence in CrossFit® [7].

Professional considerations that impact the reduction of these occurrences, in addition to overall training load, involve understanding the most affected body regions and the mechanics involved. It is known that shoulders and the lumbar region, in particular, are the most affected regions, accounting for approximately 42% and 28%, respectively. However, reviews involving practitioners of different experience levels indicate that beginners and intermediates (three studies) are affected in the shoulders and knees [8], whereas advanced practitioners (25 studies) experience issues in the shoulders and spine [9]. Certain movements may exert excessive strain on some practitioners depending on internal factors and acquired capacity. A previous study indicated that combined shoulder flexion, abduction, and internal rotation movements could be a cause of shoulder injuries in CrossFit® practitioners, along with gymnastic movements that involve supporting body weight in explosive motions [10]. Other studies [11,12] found that, in addition to movement position and action, hypermobility, excessive elasticity, and increased instability can contribute to an increased risk of shoulder injuries. Regarding the lumbar spine, it appears that the main factors are related to maximum intensities, near 1RM or personal records in movements with external weight.

Trainers can control this injury risk by managing exposure to external factors. Planning training with high volumes over time can make practitioners more susceptible to injuries. Measures throughout the prescription can be taken to minimize risks. For example, reducing joint range of motion during movements [13,14] and increasing muscle stiffness [15,16] are controllable factors that trainers can address. Considering these findings, recommendations can be made for the greater safety of participants. Encouraging preventive, compensatory, and neuromuscular awareness programs from the early stages is crucial to developing optimal levels of motor control, strength, and flexibility. Additionally, implementing tests of active range of motion is essential [12]. These measures, with the presence of a qualified professional in the specific activity, become fundamental [17].

Conclusion

In conclusion, injury prevention goes beyond controlling workload; an open-minded approach that recognizes limitations and uncertainty can guide professionals toward optimal physical conditioning.

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