



Review Article

Risk Factors for Training-Related Injuries in Army Recruits from Basic Military Training

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Abstract:

Injuries that occur during basic military training for army recruitments are a common problem affecting large populations in terms of operational capacity and cost of medical treatment. This review seeks to provide an overview of risk factors associated with training-related injuries in army recruits and look at measures that can be taken to reduce these risks. Important identified elements include physical preparedness, load, task distribution, and specific interventions, including neuromuscular and resistance training programs. Therefore, by managing these factors, the occurrence and intensity of musculoskeletal injuries (MSIs) can be reduced so the soldier can perform better and have better outcomes in training.

Keywords: Injurie, Army, Musculoskeletal Injuries, RCTs, Military Training

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Introduction:

The regular recruit basic training is aimed to prepare people for the physical and psychological conditions of military service. However, this training is rapidly intensive; the companies brought the recruits close to diverse injuries such as musculoskeletal injuries (MSIs). The present study shows that a sizable portion of the medical consultations and time lost from active duty, and in some cases discharge from service, is attributed to injuries sustained during training activities. The problem, therefore, is to recognize and address these risk factors to protect the occupants' health and the efficiency of the military operations (de

Moya, 1982). Much effort has been used to identify the incurrence of training-related injuries and possible factors that may lead to such incidents. These endogenous factors embrace age, gender, and body form, and exogenous factors embrace training volume, equipment, and climate. Knowledge of their risk factors helps design effective measures for combating the high rates of injuries experienced among recruits.

Background:

MSIs are considered to be one of the most challenging factors affecting the completion of

training in military training. According to Jones, et al, (2010), up to 40% of recruits in some military training programs sustain injuries that warrant medical attention, with stress fracture, sprain, and strain reasons for such injuries being common. Notably, risk factors can be best described as intrinsic and extrinsic risk factors. Intrinsic components include fitness, body fat percentage, and past injuries, whereas extrinsic components include training stress, rest period, and equipment and technique. Assigning preventive measures on intention has targeted these factors, especially by developing and applying exercise intervention that addresses the militaristic requirements. The last few review articles have described the importance of organizing preventive interventions utilizing different neuromuscular resistance. Hence, as implied by the study, the risk associated with military training is high, making it a significant force for improving preventive measures targeting both endogenous and exogenous factors.

Methods:

The review uses data from other randomized controlled trials (RCTs) and observational studies that examine risk factors associated with training-related injuries in army recruits. A literature search for this review was done in PubMed and the Cochrane Library using words such as voiding symptoms, male lower urinary tract symptoms, self-reported, and questionnaires for studies published between 2000 and 2020 (Dijksma et al., 2017). Studies that involved the analysis of military recruits in basic training facilities combined with the assessment of risk factors or prevention programs for MSIs were included in the review. The selected studies were compared according to the size of the sample included, the duration of training the participants received, and the type of injuries they were tested with. Therefore, this systematic review aggregates RCTs and observational studies conducted from 2000 to 2020 on potential risk factors and preventive interventions for musculoskeletal injury among military recruits in basic training and compares the inter-study risk factors about sample size, training time, and types of injuries.

The study assessed the effectiveness of enhancing the level of readiness for different types of injuries in sports, workplaces, and school environments. Injury prevention programs were systematically evaluated to reverse the elevated occurrence of injury and enhance overall preparedness in various settings. Where possible, using both qualitative and quantitative approaches, we combined results from single studies in order to deepen our insight into probable and moderating risks. Furthermore, GRADE [Grade of Recommendations Assessment, Development, and Evaluation] was used to assess the quality of identified studies because of its standard approach to determining the strength and reliability of evidence in health care (Guyatt et al., 2011). The raw data from the individual studies were aggregated wherever possible to extract further meaning and draw even more observable conclusions for application. The GRADE system was used to assess healthcare evidence regarding different prevention interventions.

Results:

The work done on the reviews shows that many factors likely contribute highly to training-related injuries. These are internal risk indicators comprised of low levels of fitness, reduced aerobic fitness, and less muscular endurance. Literature review reveals that first-time recruits, particularly those in poor health, are most likely prone to injuries during drills (Amako, et al, 2003). Other factors of internal origin also exist, including age and gender, because recruits, especially younger ones, and females, are prone to injuries due to genetic factors such as bone density, muscles, and hormonal balances. In addition, the lack of proper measures to ensure adequate rest between the workout sessions also exposed the bone joints to more frequent injury; chronic joint ailment in combination with the wrong form used in exercising was another factor placing the bone joints at risk of being injured. The factors indicate the need for specialized fitness programs and measures to prevent injuries.

Constrictive shoe wear, inadequate cooling, high training volume, and insufficient recovery between exercise sessions have been established as extrinsic

causative agents of injuries, particularly for athletes. Lifting many weights at once or exercising without the proper rest and repair time takes its toll on the body and significantly boosts the likelihood of developing various kinds of injuries, such as stress fractures or muscle strains. An article by Knapik et al. (2012) established that failure to modify exercise intensity or duration progressively often results in more frequent stress fractures and soft tissue injuries. Minimizing these risks is possible by correctly selecting and using the right equipment in railways. Athletes should also be incredibly disciplined regarding their training and the time they dedicate to training because it has to be on the athlete's recovery capacity. Therefore, regarding practical training, the equation for injury prevention includes correct tools, gradual progression, sufficient rest, hydration, nutrition, and overall balance.

The study was confined to strategy and progression from feint to a higher volume and intensity to minimize the risk of producing an injury and for the body tissues to heal and build new ones. Besides, the study revealed that shoes are also used to protect the lower limbs and the body since they relieve part of the body weight and pressure on the feet from the ground. Study findings provide evidence for the integrated model for the positive aspects of performance enhancement and safe approaches to training (Pope, Herbert, & Kirwan, 1998). In addition, a choice of shoes that corresponds to one's biomechanics and that can be used during all typologies of activities is crucial for enhancing support and safeguarding. Due to this, the study stresses the need for individual training programs tailored to an individual's fitness regimes and combining an effective regime that should help achieve these results without infrequent injuries.

Discussion:

Based on the analyzed literature, it is clear that only a model of injury prevention in training must encompass intrinsic and extrinsic risk factors. Fitness was found to be the most modifiable risk factor; recruits who participated in pre-training conditioning programs that included assessments of aerobic power, muscle endurance/flexibility,

and who had low levels of injury (Bullock, et al, 2010). As the case is with any physically and mentally demanding work, diet, water intake, and rest, play a large part in the ability to handle stress. Prevention and early intervention measures include health risk appraisals and personal workouts tailored to initial fitness assessments and analysis of clients' medical histories to minimize hazards (Kaufman, Brodine, & Shaffer, 2000). Thirdly, a well-balanced diet and water retention ensure that muscles remain strong and bone mass is intact; good shoes and equipment prevent over-use injuries and acute events. This approach ensures that training requirements are constructed to match capability level, leaving a shallow risk for injury due to overworking.

Taking a cue from the progressive training programs and the protective measures against injuries, there should be a package for military fitness. It includes physiological fitness, psychological preparation, technical enhancement, and hydration/fuel to meet rigorous physical needs and sustain recovery. Most functional fitness workouts imitate real-life military activities like loaded carries and obstacle course training to improve mission preparedness (Lauersen, Andersen, & Andersen, 2018). Sleeping and taking water are part of the recovery mechanism, which is imperative for fitness and productivity during the event. The training coordinator decides how training is administered: Periodic fitness assessment, development of an overall conditioning program, and incidentals to follow to train for the deficiencies (Cheung, Hume, & Maxwell, 2003). Instructing a recruit in injury prevention strategies, correct biomechanics, and effective body positioning makes the officer responsible for the changes. Prolonged moderate load, strength training, neuromuscular adaptations, and functional training reduce risks of injuries and promote the performance and overall physical fitness of military men and women throughout a lifetime.

Leadership influences access to, engagement with, and receiving targeted injury prevention interventions. Leaders and trainers are responsible for incorporating safe sports efforts. The

researchers have suggested that introducing such practices as a week off for the military personnel, warm-ups, and correct training schedules could probably be pursued to reduce the rates of such injuries among the military forces (Goodall, et al, 2013). Moreover, managing the organization's leadership concerning injury prevention is more than enforcing policies. Supervisors who attend to and support effective measures against injuries and set a good example constitute an organizational safety climate in their units. When capturing injury prevention as a valuable process, the leaders interested in such exercise can easily present it to higher command as a military requirement that will generate more effect in the long run than it costs. As a result, a safety-conscious culture and a focus on not only minimizing people's harm but also the organization's viability are crucial.

Conclusion:

One of the biggest problems is training injuries, especially in military training, are manageable conditions if specific measures are taken. The studies have confirmed that various intrinsic and extrinsic elements can be minimized to prevent injuries and improved to decrease the risk of injuries for participants involved in sports and exercises. Implementing progressive training, strength conditioning, and neuromuscular exercise cut the incidences of injuries. As for further research, special attention should be paid to the contingency of the training regimens based on the baseline fitness values, body fat distribution, and history of injuries. Wearable technology devices and innovative artificial intelligence could formally and effectively improve the prediction and prevention of injuries. Physical therapists, exercise trainers, and doctors should work hand in hand with each other to design a comprehensive measure for preventing the occurrence of an injury. Overall, a collaborative approach utilizing data-driven insights and tailored training regimens is essential for effectively reducing training-related injuries.

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