The Effect of a Structured Neuromuscular Warm-Up on the Risk of Injury in Young Soccer Athletes

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The Topic

Female participation in sports, specifically soccer, has experienced a world-wide upsurge. LaBella et al. (2011) notes a 900% increase in girls’ involvement in high school sports over the past 40 years. The increase in the number of female soccer athletes has led to female injury rates rising to approach those of their male counterparts (Soligard et al., 2008). Female soccer players injure their anterior cruciate ligament (ACL) significantly more often than males, explained by a number of reasons that include neuromuscular differences (Kiani, Hellquist, Ahlqvist, Gedeborg, & Byberg, 2010). Sports related injuries can prevent further involvement in exercise and the health benefits gained from it, can require expensive treatments and surgeries, and can lead to higher risk of osteoarthritis (LaBella et al.). Based on the prevalence of injury in female soccer players and the risks and costs they pose on the athletes, prevention methods need to be used in training for all athletes.

The Research Problem

Over the past recent years, researchers developed multiple, new warm-up routines to test their preventative effects on soccer injuries. Kiani et al. (2010) created a “soccer-specific physical exercise program including education” (p. 43) that lowered noncontact and knee injury in adolescent female soccer players by 90% and 77% respectively. This study demonstrated the success and practicality of a prevention program by the high compliance and decreased injury rate (Kiani et al.). FIFA, the international soccer association, developed “The 11,” an injury prevention program aimed towards reducing the most common soccer injuries such as ankle and knee injuries (Junge et al., 2010). The program was implemented in Switzerland, the first country-wide program of its kind, and reduced practice and game injuries by 25% and 12% respectively (Junge et al.). FIFA revised “The 11” by adding variety and new running exercises to increase compliance, resulting in “The 11+” (Soligarde et al., 2008). Soligarde et al. taught “The 11+” program to 13-17 year old girls’ club soccer teams. The trial “showed that the risk of
injury can be reduced by about one third and severe injuries by as much as one half” (Soligarde et al., Discussion section, para. 1), again demonstrating the success and practicality of an injury prevention program.

All three injury prevention programs described were used as a warm-up routine before practices and modified programs were used before games (Junge et al., 2010; Kiani et al. 2010; Soligarde et al., 2008). Soligarde et al. and Kiani et al. both noted that injuries that did occur in players using a preventative warm-up were often less severe than those using a common warm-up.

Kiani et al. (2010) believes that starting the warm-up at a younger age will lower injury risk because “younger players who have not yet established their motion patterns” (p. 47) will learn proper technique early on preventing future injuries. Olsen, Myklebust, Engebretsen, Holme, & Bahr (2005) and Soligarde et al. (2008) claim that injury prevention programs should be initiated when first starting an organized sport such as soccer. The previously described injury prevention programs proved very successful; however, similar research on this age group has not yet been conducted. A structured neuromuscular warm-up needs to be instituted on club soccer teams of young female athletes to determine its effect on injury risk because such warm-ups are not currently in use at a young age and have proved to be very successful in reducing injury risk in adolescents.

**Deficiencies in the Evidence**

Olsen et al. (2005) and Soligarde et al. (2008) agree that preventative programs need to be tested on young and adult age groups outside of adolescent age group tested, 13-17 years old and 15-17 years old respectively.

More in depth research is needed on the causes of not complying with the warm-up routine. Vague reasons were sometimes provided, but without clear reasons for the lack of compliance, researchers cannot determine a method for increasing compliance.
Definition of Terms

- Exposure: the total number of hours played in games and practice.
- Injury prevention program: an example is a structured neuromuscular warm-up.
- Injury type: acute, overuse, or re-injury as defined by Soligard et al. (2008).
- Player: a female athlete between the ages of 8-11 years old and on a soccer club team roster.
- Reportable injury: an injury that causes an inability to perform in all or a part of a practice or a game that occurred during a practice or a game.
- Severity: slight, minor, moderate, or major as defined by Olsen et al. (2005).
- Structured neuromuscular warm-up: a coach led warm-up routine lasting about 20 minutes and including strength, dexterity, balance, and plyometric exercises focused on proper form.

Purpose of the Study

The purpose of the study is to test the ability of a structured neuromuscular warm-up to lower the risk of injury in young female club soccer players. The primary field of study is preventative medicine and the secondary field of study is sports medicine. The most frequent injury in players include “injuries to the knee and ankle ligament and thigh muscle strains” (Soligard et al., 2008) which can increase the chance of osteoarthritis. When considering the immediate and potential future health impairment of such injuries, the necessity of preventative measures becomes evident. Junge et al. (2010) demonstrates the ability to disseminate a successful injury prevention program throughout Switzerland. The study implies that a similar program could be applied in other regions of the world, but first it needs to be tested on young players which leads to the governing question of this thesis, How will introducing a structured neuromuscular warm-up to young female soccer players affect their risk of injury? The subquestions include:
WARM-UP EFFECT ON INJURY RISK

1) How can compliance to the warm-up be increased?

2) How will current structured neuromuscular warm-ups need to be adjusted to enable younger athletes to complete it?

3) Do participants think they are likely to continue to complete this warm-up?

4) Do participants think that completing the warm-up led to decreased injury rates?

5) How does the effect on injury risk at the 8-11 age group compare to that of older adolescents?

6) Does starting the warm-up at 8-11 years old prevent poor exercise technique from developing?
References


Potential Sources Bibliography


