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SPECIFIC FEATURES OF SLEEP IN THE DAILY ROUTINE OF FEMALE TRACK AND FIELD ATHLETES

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Relevance

Track and field is a sport characterized by a high level of physical activity, in which the bodies of female athletes require not only intensive daytime training loads but also a distinct need for nocturnal recovery. In sports physiology, sleep is regarded as the principal period during which the recovery of muscle tissue, the maintenance of hormonal balance, and the rest of the central nervous system take place. At the same time, contemporary scientific literature emphasizes that the majority of sleep research in sport has historically been oriented toward male athletes, while aspects of female athletes' sleep physiology — including those tied to the menstrual cycle, hormonal fluctuations, and sex-specific stress factors — remain insufficiently studied to this day. This situation creates the need to develop a scientifically grounded, individualized sleep regimen for female track and field athletes and underscores the relevance of the topic.

Aim

The aim of the study is to scientifically analyze the specific physiological and hygienic characteristics of the sleep regimen in the daily routine of female track and field athletes, to identify the principal factors influencing it, and to develop practical recommendations.

Research Objectives

1. To examine the relationship between the physiological characteristics of female track and field athletes and their need for sleep;

2. To identify the principal factors affecting sleep quality and quantity;

3. To analyze the influence of the menstrual cycle and hormonal changes on sleep structure;

4. To study the effect of training and competition schedules on sleep patterns;

5. To develop practical recommendations for improving sleep hygiene.

Materials and Methods

International scientific articles, systematic reviews, and dissertations published between 2009 and 2026 were analyzed as material for the study (10 primary sources in total). The study employed methods of theoretical analysis, systematization of the literature, and comparative analysis. The analysis drew on research published in authoritative journals such as Sleep Science and Practice,

Sports Medicine, Journal of Sleep Research, and Frontiers in Sports and Active Living, as well as research data from the medRxiv and ClinicalTrials.gov platforms.

Results and Discussion

1. The Physiological Significance of Sleep

The analysis found that growth hormone (somatotropin) is secreted at its highest level during deep (slow-wave) sleep, and that this is essential for the recovery of muscle tissue. A decline in cortisol (the stress hormone) during sleep helps prevent excessive fatigue after training. REM sleep, in turn, plays an important role in the recovery of the central nervous system and in the consolidation of motor skills at the level of the brain. A study conducted at Stanford University found that extending basketball players' sleep to as much as 10 hours led to faster sprint times and an improvement of at least 9% in free-throw accuracy; comparable results were observed among female swimmers as well. A large-scale study of elite and sub-elite athletes found poor sleep quality, measured by the overall Pittsburgh Sleep Quality Index (PSQI), in 64–65% of athletes — evidence of how widespread sleep problems are within the athletic population.

2. Sleep Regimen (9:30–10:00 PM)

Quality sleep is essential for female athletes. Specialists recommend that athletes get at least 8–9 hours of sleep per day. Sleep supports the body's recovery and supplies energy for subsequent training. During nighttime sleep, the hormones somatotropin (growth and development) and melatonin (sleep) are produced in large quantities. Full, adequate sleep helps keep the menstrual cycle regular, speeds the healing of injuries, improves training effectiveness, and sharpens attention and reaction speed. When sleep is insufficient, fatigue, weakness, reduced concentration, and lowered immunity result; injuries heal more slowly, and performance declines.

2. Specific Characteristics of Female Athletes' Sleep

The analysis showed that women's sleep is objectively of higher quality than men's, yet young women's sleep is more resilient to external stress factors. At the same time, women tend to rate their own sleep quality lower, subjectively, than men do — a discrepancy between objective and subjective sleep measures. Preliminary data suggest that women may be more prone than men to prolonged wakefulness and circadian-rhythm disruption. Changes in progesterone and estrogen levels across the phases of the menstrual cycle were found to directly affect body temperature, sleep-onset latency, and overall sleep quality. For this reason, contemporary sports-physiology specialists recommend that sleep and recovery programs for female athletes be individualized, taking into account the menstrual cycle, training load, and life stage.

3. Sport-Specific Stress Factors

The analysis identified a number of stress factors specific to female track and field athletes: heavy training loads and their rapid escalation, late-evening competitions and intensive sessions, early-morning workouts, time-zone shifts during travel, the need to balance academic and athletic demands, and the constant connectivity that modern life requires. Among fifty athletes surveyed, sleep disturbance was reported in 50–80% of cases, with severe sleep disruption reported in 22–26% of cases.

4. Effectiveness of Individualized Sleep Hygiene Programs

In one of the studies analyzed, after an individualized, media-based sleep hygiene program was introduced, female athletes showed marked improvement across a number of sleep indicators — including positive results even at mid-season, during the period of peak training load. This confirms the effectiveness of the individualized approach.

Conclusions

The analysis supports the following conclusions:

1. The sleep regimen in the daily routine of female track and field athletes matters not only for preserving general health but also for improving athletic performance and lowering the risk of injury;

2. Female athletes' sleep physiology is tied to hormonal cycles, sport-specific stress factors, and sex-specific characteristics, all of which must be given particular weight when planning the daily routine;

3. The phases of the menstrual cycle noticeably affect sleep structure, so it is advisable that recovery programs be built around these phases;

4. Individualized sleep hygiene programs that account for training load and the menstrual cycle substantially improve recovery in female track and field athletes;

5. Coaches, sports physicians, and athletes themselves are encouraged to monitor sleep quality on an ongoing basis, align training schedules with circadian rhythms, and apply an individualized approach to each athlete.

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