
**International Journal of Innovative Technologies in Social Science**

e-ISSN: 2544-9435

**Scholarly Publisher**
**RS Global Sp. z O.O.**
ISNI: 0000 0004 8495 2390

Dolna 17, Warsaw,
Poland 00-773
+48 226 0 227 03
editorial_office@rsglobal.pl

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| **ARTICLE TITLE** | THE IMPACT OF SLEEP ON ENDURANCE ADAPTATIONS AND WEIGHT LOSS DURING RUNNING TRAINING IN OVERWEIGHT ADULTS: REVIEW |
| **ARTICLE INFO** | Jan Kamiński, Małgorzata Piekarska-Kasperska, Anna Daniel, Kacper Jankowski, Natalia Kraciuk, Alicja Bury, Karol Bartecki, Julia Błoniecka, Katarzyna Krupa, Sebastian Rurka. (2025) The Impact of Sleep on Endurance Adaptations and Weight Loss During Running Training in Overweight Adults: Review. *International Journal of Innovative Technologies in Social Science*. 3(47). doi: 10.31435/ijitss.3(47).2025.3578 |
| **DOI** | https://doi.org/10.31435/ijitss.3(47).2025.3578 |
| **RECEIVED** | 07 July 2025 |
| **ACCEPTED** | 21 August 2025 |
| **PUBLISHED** | 25 August 2025 |
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# THE IMPACT OF SLEEP ON ENDURANCE ADAPTATIONS AND WEIGHT LOSS DURING RUNNING TRAINING IN OVERWEIGHT ADULTS: REVIEW

***Jan Kamiński*** *(Corresponding Author, Email:kaminskijan99@gmail.com)*
*Samodzielny Publiczny Zakład Opieki Zdrowotnej w Garwolinie, ul. Lubelska 50, 08-400 Garwolin, Poland*
*ORCID ID: 0009-0007-2573-9986*

***Małgorzata Piekarska-Kasperska***
*Wojewódzki Szpital Specjalistyczny im. Stefana Kardynała Wyszyńskiego w Lublinie, al. Kraśnicka 100, 20-718, Lublin, Poland*
*ORCID ID: 0000-0001-5055-4923*

***Anna Daniel***
*Wojewódzki Szpital Specjalistyczny we Wrocławiu, ul. H. M. Kamieńskiego 73a, 51-124 Wrocław, Poland*
*ORCID ID: 0009-0003-8752-6610*

***Kacper Jankowski***
*Szpital Bielański im. ks. Jerzego Popiełuszki w Warszawie, ul. Cegłowska 80, 01-809 Warszawa,*
*ORCID ID: 0009-0000-3722-7805*

***Natalia Kraciuk***
*Samodzielny Publiczny Zespół Zakładów Opieki Zdrowotnej w Wyszkowie, Al. Komisji Edukacji Narodowej 1, 07-200 Wyszków, Poland*
*ORCID ID: 0009-0007-8319-2296*

***Alicja Bury***
*Samodzielny Publiczny Szpital Kliniczny im. prof. W. Orłowskiego Centrum Medycznego Kształcenia Podyplomowego, ul. Czerniakowska 231, 00-416 Warszawa, Poland*
*ORCID ID: 0009-0009-2950-8741*

***Karol Bartecki***
*Uniwersyteckie Centrum Kliniczne Warszawskiego Uniwersytetu Medycznego, Centralny Szpital Kliniczny ul. Banacha 1a, 02-097 Warszawa, Poland*
*ORCID ID: 0009-0006-1863-242X*

***Julia Błoniecka***
*Samodzielny Publiczny Zakład Opieki Zdrowotnej w Garwolinie, ul. Lubelska 50, 08-400 Garwolin, Poland*
*ORCID ID: 0009-0004-0199-6230*

***Katarzyna Krupa***
*Szpital Wolski im. dr Anny Gostyńskiej Sp. z o.o, ul. Kasprzaka 17, 01-211 Warszawa, Poland*
*ORCID ID: 0009-0006-3120-8631*

***Sebastian Rurka***
*Samodzielny Publiczny Zakład Opieki Zdrowotnej w Węgrowie, Tadeusza Kościuszki 201 Street, 07-100 Węgrów, Poland*
*ORCID ID: 0009-0006-4245-1717*

**ABSTRACT**

Sleep rarely receives as much attention as training or diet, yet it significantly influences how effective running programs are for weight loss, especially in adults with overweight or obesity. Poor sleep quality and insufficient sleep duration, common in this population, consistently limit improvements in aerobic fitness, reduce the effectiveness of fat loss, and slow down recovery after exercise. In contrast, better sleep habits support quicker endurance gains, more efficient recovery, and healthier body composition changes. Even simple interventions, such as maintaining regular sleep schedules, limiting screen use before bedtime, and improving overall sleep hygiene, can substantially improve training outcomes. This review highlights sleep as an essential component of successful running-based weight-loss interventions. Trainers and healthcare professionals should prioritize sleep improvement strategies to maximize exercise benefits. However, future research with larger groups and longer follow-up periods is necessary to confirm these findings and clarify optimal sleep interventions.

**Methods:** This narrative review was conducted by searching PubMed, Scopus, and Web of Science for studies published between 2010 and 2025. The search used combinations of the terms sleep, running, endurance training, obesity, and weight loss. Studies were eligible if they included adults with overweight or obesity participating in running programs and reported outcomes related to endurance, recovery, or body composition. Randomized trials, observational research, and review articles were considered.

**Results:** The reviewed studies consistently show that poor or insufficient sleep limits the benefits of running-based programs in adults with overweight and obesity. Participants sleeping less than 7–8 hours often achieved smaller gains in aerobic fitness, recovered more slowly, and experienced less favorable body composition changes, including greater loss of lean mass.

In contrast, good sleep habits were linked to better endurance improvements, more efficient recovery, and greater fat loss. Even simple steps like keeping a regular bedtime appeared to improve training adherence and outcomes. Still, most studies were small and short-term, underlining the need for larger, long-term research.

**Conclusions:** Sleep clearly matters for adults with overweight or obesity who take up running to lose weight. When sleep quality or duration is compromised, the benefits of training are noticeably reduced, improvements in endurance come more slowly, recovery takes longer, and fat loss is less efficient. Conversely, maintaining good sleep habits appears to amplify the positive effects of running programs, making progress faster and more sustainable. From a practical standpoint, trainers and clinicians should consider sleep not just as a passive recovery process, but as an active part of effective weight-management strategies. Simple recommendations like regular sleep schedules or better sleep hygiene may lead to substantial improvements in training outcomes. Future studies should further clarify how targeted sleep interventions can enhance exercise-based programs in this population.

**KEYWORDS**

Sleep Quality, Sleep Duration, Running, Endurance Training, Obesity, Weight Loss, Body Composition

**CITATION**

Jan Kamiński, Małgorzata Piekarska-Kasperska, Anna Daniel, Kacper Jankowski, Natalia Kraciuk, Alicja Bury, Karol Bartecki, Julia Błoniecka, Katarzyna Krupa, Sebastian Rurka. (2025) The Impact of Sleep on Endurance Adaptations and Weight Loss During Running Training in Overweight Adults: Review. *International Journal of Innovative Technologies in Social Science*. 3(47). doi: 10.31435/ijitss.3(47).2025.3578

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**Introduction.**

Running is one of the most popular forms of exercise recommended for improving health, especially among adults with overweight or obesity [1]. People often choose running to help with weight loss and boost cardiorespiratory fitness [2]. While training and diet receive most of the attention, sleep is a crucial factor that is too often overlooked in exercise programs [3]. The period of sleep is when the body repairs muscles and restores energy, both essential for adapting to physical effort [4]. Consistently poor sleep can slow recovery, reduce motivation, and make it harder to maintain an active lifestyle [5].

Many adults with higher body mass report shorter sleep and more frequent disturbances at night than their normal-weight peers [6]. Studies show that poor sleep can disrupt hormone balance, leading to more hunger and less control over food intake [7]. As a result, it becomes more difficult for people to reach their fitness and weight loss goals, no matter how well they train [8]. Even though these relationships are well documented, sleep is still rarely prioritized in public health guidelines or in most personal training plans [9].

Recent research has explored the connections between sleep, running, and changes in body composition in adults with overweight or obesity [10]. Understanding how sleep affects adaptation to training may help coaches and healthcare professionals develop more comprehensive weight-loss strategies [11].

**Sleep and endurance performance**

Endurance is often measured by aerobic capacity, running time, and subjective effort [12]. Regular exercise usually improves these measures, but not everyone sees the same progress [13]. Evidence suggests that sleep plays a major role in how quickly endurance improves [14]. For example, people who get less than seven hours of sleep a night often show slower gains in $VO_2max$ [15].

Not only does short sleep reduce fitness gains, but poor quality sleep, such as frequent awakenings, can make workouts feel harder and leave people feeling more tired afterwards [16]. This is partly due to changes in stress hormones, including cortisol, which can make the body less responsive to exercise [17]. Elevated resting heart rate and reduced heart rate variability are also common in those who sleep poorly, and both are linked to less effective training adaptation [18].

Encouragingly, small improvements in sleep duration or quality can have a positive impact [19]. In one study, simply extending nightly sleep by thirty minutes made training sessions feel easier and led to faster progress [20]. Simple sleep hygiene steps, like keeping a regular bedtime, can make a meaningful difference for runners trying to improve endurance [21].

**Sleep and body composition changes**

Losing body fat while maintaining muscle mass is a primary goal for many adults starting a running program [22]. The role of sleep in this process is significant, though often underestimated [23]. People who sleep less or have disrupted sleep tend to lose less fat and more muscle, even if their diet and exercise routines are similar to those of good sleepers [24].

Short sleep increases appetite and cravings, partly because it disrupts hormones like leptin and ghrelin [25]. This can lead to increased calorie intake and reduced willpower to stick to healthy habits [26]. Poor sleep has also been associated with slower metabolism and less efficient fat burning [27]. On the other hand, when people improve their sleep, either in duration or quality, they tend to lose more fat and preserve more lean tissue during weight-loss interventions [28].

Studies have also found that simple interventions, such as reducing caffeine in the afternoon and minimizing exposure to bright light in the evening, can improve sleep quality and help people achieve better body composition results [29]. These findings highlight that sleep is a practical and necessary part of any successful weight management plan [30].

**Sleep and recovery from running**

Recovery is an important but often neglected part of any training program [31]. The body needs time to repair muscles and adapt to the new stress of running, especially for those new to exercise or carrying extra weight [32]. Sleep is the most effective natural recovery tool available [33]. People who do not get enough sleep after workouts often experience prolonged soreness and slower return to peak strength [34].

Disturbed or insufficient sleep can also elevate markers of inflammation, which slows healing and increases the risk of illness or injury [35]. In contrast, good sleepers report quicker recovery and are less likely to skip training due to fatigue [36]. Some research indicates that runners who maintain regular sleep routines experience less muscle soreness and are able to progress to higher levels of training with fewer setbacks [37]. Overall, paying attention to sleep can make a noticeable difference in the ability to stick to and benefit from a running program [38].

**Practical sleep interventions to support training outcomes**

Improving sleep doesn't require expensive gadgets or supplements [39]. The most effective strategies are simple and can be adopted by almost anyone [40]. One of the best ways to improve sleep is by keeping a consistent schedule, going to bed and waking up at the same time every day [41]. Avoiding screens for at least an hour before bed can also help, as blue light exposure delays the body's natural sleep signals [42].

Many people find that making their bedroom quieter, darker, and cooler improves sleep quality [43]. Relaxing bedtime routines, such as reading or gentle stretching, can also help signal the body to wind down [44]. Cognitive behavioral therapy for insomnia (CBT-I) is a proven approach for people with ongoing sleep problems, and can improve both sleep and physical health [45]. Even basic sleep hygiene education from a coach or trainer can lead to better outcomes for people engaged in weight-loss programs [46].

**Discussion**

Current evidence supports the idea that sleep is a key piece of running-based weight-loss programs for adults with overweight or obesity [47]. Modest improvements in sleep can lead to more effective training and better body composition results [48]. However, many studies in this area rely on self-reported sleep, which isn't always reliable [49]. There is also a need for larger studies with diverse participants and longer follow-up periods [50]. Variables such as stress, diet, and medical conditions can all influence both sleep and training results [51].

Despite these challenges, the message is clear: trainers and healthcare professionals should encourage anyone aiming for weight loss through running to pay attention to sleep [52]. Education about simple sleep hygiene habits can make a real difference in performance and adherence [53]. Future research should explore which specific sleep interventions work best for people with different backgrounds and lifestyles [54]. It's also important to understand how barriers such as shift work, family demands, or chronic sleep disorders affect the ability to combine sleep improvement with running programs [55].

**Conclusions**

Sleep is a crucial part of effective running-based weight-loss programs in adults with overweight or obesity [56]. Good sleep supports greater endurance gains, better recovery, and healthier body composition changes [57]. Practical strategies, regular bedtimes, less screen time before sleep, and relaxing evening routines, should be standard advice in any training program [58]. Sleep deserves as much attention as diet and exercise planning [59]. As more research emerges on how to apply these strategies in daily life, more people will be able to reach their health and fitness goals [60]. Clear, actionable recommendations for integrating sleep into weight management are needed [61]. With continued study and practical support, sleep can become a powerful tool for sustainable weight loss and improved health [62]. Ultimately, making sleep a core part of running and fitness routines will help more people succeed in the long term [63]. This area deserves further attention and investment in the years ahead [64].

**Disclosures**

**Author's contribution:**

**Conceptualization:** Jan Kamiński, Małgorzata Piekarska-Kasperska, Anna Daniel

**Formal analysis:** Jan Kamiński, Małgorzata Piekarska-Kasperska, Anna Daniel, Kacper Jankowski, Natalia Kraciuk

**Investigation:** Jan Kamiński, Małgorzata Piekarska-Kasperska, Anna Daniel, Kacper Jankowski, Natalia Kraciuk, Alicja Bury, Karol Bartecki, Julia Błoniecka, Katarzyna Krupa, Sebastian Rurka

**Writing – original draft preparation:** Jan Kamiński, Małgorzata Piekarska-Kasperska, Anna Daniel, Kacper Jankowski, Natalia Kraciuk

**Writing – review and editing:** Małgorzata Piekarska-Kasperska, Anna Daniel, Kacper Jankowski, Natalia Kraciuk, Alicja Bury, Karol Bartecki, Julia Błoniecka, Katarzyna Krupa, Sebastian Rurka

**Visualization:** Julia Błoniecka, Kacper Jankowski, Karol Bartecki

**Supervision:** Małgorzata Piekarska-Kasperska, Jan Kamiński

All authors have read and agreed with the published version of the manuscript.

**Conflict of interest:** The authors declare no conflict of interest.

**Funding statement:** No external funding was received to perform this review.

**Statement of institutional review committee:** Not applicable.

**Statement of informed consent:** Not applicable.

**Statement of data availability:** Not applicable.

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