

Walk for a Better Night of Sleep!

Is more walking the solution to getting high-quality sleep? If so, does walking help increase sleep duration, sleep quality, or both? These questions were asked by researchers Sullivan Bisson et al, and the findings were published in the journal *Sleep Health* in 2019 (3).

It is well-known that many adults have difficulty sleeping. A large percentage of Americans don't get enough sleep, and many take various pharmacological sleep aids in an effort to solve the problem. Poor sleep can lead to serious public health problems, such as car and truck accidents resulting from a fuzzy mind state. Decreased work productivity, depression, and various diseases have been linked to a lack of high-quality sleep. What can be done?

Researchers are increasingly curious about the effects of physical activity on sleep. In the study by Sullivan Bisson and colleagues, 59 participants with an average age of 49.43 years were recruited; 72% of those were female. Participants were randomly divided into either an intervention or a control group for the 4-week study period. All were given a Fitbit Zip to measure number of steps per day and number of active minutes per day. Since the Fitbit Zip only counted active minutes in bouts of 10 minutes or longer, continuous activity duration was easier to quantify. In contrast, steps were recorded constantly, even when simply walking from one side of the room to another and sitting down again. For the first week, participants in the intervention group were asked to take 2,000 more steps per day than they had taken in the baseline week; 2,000 more steps/day were added for each succeeding week. The intervention group was provided with support in terms of goal setting, scheduling, walking maps, and other physical activity tips. Although the control group also wore the Fitbit Zip, they were not provided with any support for increasing step number or duration. Sleep was measured in both groups using the Pittsburgh Sleep Quality Index, which included questions regarding quality (how rested a person feels on the following day) and quantity of sleep. Data were collected nightly over 4 weeks during the study.

Results showed that the intervention group achieved a significantly greater number of steps from baseline—a 27.77% increase, with an average of 7,260 steps per day over the course of the study, and averaging 184 active minutes per day. The intervention group also happened to be significantly younger (46.3 years old vs 52.5 years old for the control group). Overall, statistical analysis showed that daily active minutes were correlated with improved sleep quality, and this effect was greater for women than for men. The authors suggest that the results may have been somewhat different if more men had been included in the study. Since the manipulated variable was walking—presumably at a relatively low-intensity, the findings suggest that high-intensity exercise isn't necessary to promote better sleep. Lower-intensity, low-impact, longer-

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duration activity may be sufficient for a good night's sleep, which is happy news for middle-aged and older adults for whom high-impact activities are problematic. Since most Americans can track their steps with either a smartphone or an activity tracker, this is practical information that is relatively easy to recommend.

In conclusion, the authors write that low-impact physical activity and sleep are positively related. When a person is more active than average, they report sleeping better and longer than when they're less active. It's possible that step counts and daily active time can predict sleep quality and perhaps even sleep duration in healthy middle-aged and older adults, so let's keep moving!

The Relationship between Stress and Unhealthy Eating Behaviors in Overweight and Obese Youth

A recently published study by Ajibewa and colleagues in the journal *Appetite* (1) aimed to explore whether increased stress was associated with increased dieting behavior among adolescents with overweight and obesity challenges. The authors were also interested in whether there were any differences in dieting behavior between adolescent males and females, and between adolescent non-Hispanic blacks and non-Hispanic whites.

What was meant by increased dieting behavior? Dysfunctional attitudes toward food and heightened body dissatisfaction are potential precursors to disordered eating, which can lead to extreme caloric restriction, skipped meals, binge eating, laxative abuse, and self-induced vomiting. One model of eating pathology suggests that stress can lead to body image problems, which leads to unhealthy dieting and caloric reduction practices, leading to negative mood states, which in turn can increase the tendency to binge-eat as a way to temporarily feel better (2).

Ajibewa et al collected data on 161 participants with an average age of 16.7 years. Participants were 65% female, 53% non-Hispanic black, and 47% non-Hispanic white. A 13-item Eating Attitudes Test was given, in addition to the 14-item Perceived Stress Scale questionnaire. Height, weight, BMI, body fat (using DEXA), and pubertal development were assessed; participants self-reported their race and gender. Multivariate linear regression models were performed in order to examine the relationship between stress, dieting behavior, and other variables such as gender and race.

What were the findings? As might be expected, psychological stress was significantly linked to unhealthy dieting behaviors. And the greater the stress, the more the participants struggled with disordered eating patterns. This was true no matter the participants' gender or race. Increasing (or decreasing) food appears to be a popular way for many overweight and

obese youth to combat stress. Obviously however, this short-term perceived benefit increases the risk of long-term health problems.

To best help adolescents struggling with psychological stress, health/fitness practitioners can provide appropriate physical activity programs, and encourage other stress management techniques such as mindfulness practice, yoga, meditation, and tai chi. Adolescents can also learn strategies for anger management and improved communication skills, and may benefit from additional evidence-based stress prevention practices such as writing in a gratitude journal, deep breathing, and repeating a daily positive self-affirmation. These and other similar stress management techniques may help to prevent negative thinking and excessive stress in overweight and obese adolescents, and thereby reduce the possibility of more serious eating disorders.

Love Battling Ropes? What is the Metabolic Cost?

Battling ropes have become popular in many fitness settings, and provide yet another modality for the improvement of cardiovascular fitness and localized muscle endurance. Utilizing battling ropes, researchers Brewer et al (4) decided to compare levels of oxygen consumption, heart rate (HR) response, and rate of perceived exertion (RPE) with those achieved on a treadmill and a stationary bike. Brewer and colleagues were particularly curious about metabolic differences between standing and seated positions.

The study design consisted of randomly assigning 40 healthy participants (24 females and 16 males with an average age of 24.8 years) to either seated exercise or standing exercise. Those performing a seated battling ropes protocol were also asked to perform a seated bike VO_{2max} test. Those performing a standing battling ropes protocol were asked to perform a treadmill VO_{2max} test. The battling ropes protocols were performed on separate days from the VO_{2max} tests. A ramped Bruce protocol was used for the treadmill test, while the YMCA protocol was used for the ramped cycle ergometer test. The battling rope protocol utilized 50-foot long ropes that were 1.5 inches in diameter. Double-arm swings were performed at a cadence of 100 beats/minute for 15 seconds (work bout), followed by 45 seconds of rest, for 10 bouts.

A major finding was the fact that metabolic responses (VO_2 , HR, RPE) were significantly lower for the sitting and standing battling ropes protocols as compared to the values achieved on the cycle ergometer and the treadmill. Questions remain regarding whether the lower values were due to the interval-type protocol used with the battling ropes as compared to the more continuous protocols used for the cycle and treadmill tests. That said, it was found that battling ropes, whether standing or seated, nevertheless produce acute metabolic responses that may improve aerobic fitness. When seated, battling ropes produced a VO_{2peak} that was 71.87% of that

on the cycle; when standing, battling ropes elicited a VO_{2peak} that was 68.37% of that on the treadmill.

Another relevant finding was that peak heart rates were not significantly different between the standing and seated positions when using the battling ropes. The authors write that this finding is important for those with lower-body impairments, or for those who have trouble with balance and rhythmic leg movements. Battling ropes can provide yet another effective modality for sub-clinical populations.

Battling ropes are affordable and reasonably accessible; they may be used indoors or out, and by those who can stand and by those who must sit. Progressions are possible by varying the rope thickness and length, the type of swing used, the speed, and the work/rest ratios. Give them a try!

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3. Sullivan Bisson AN, Robinson SA, Lachman ME. Walk to a better night of sleep: testing the relationship between physical activity and sleep. *Sleep Health*, 2019; 5(5): 487-494,
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