Use of an Innerspring Mattress Improves Deep Sleep and WASO

Holly M. Rus, PhD, Sharon Danoff-Burg, PhD, Colin Burke, PhD, Shaddy K. Saba, MA, Morgan A. Weaver, BA, Kiara C. Carmon, BA, Duvia Lara Ledesma, MA, & Devanshi Upadhyaya, BA

Introduction

- This study compared sleep on an innerspring mattress to participants' prior sleep on their original mattress (no more than 8 years old).
- Previous research has shown that comfort, including comfort of the sleep surface, is essential to sleep quality.
- More empirical research is needed to establish the impact of mattresses on both objective and self-reported measures of sleep.

Materials & Method

Sample & Design

- 18 healthy adults (68% female, ages 23-69).
- 10-week field study, within subjects, pre-post.

Intervention & Measures

- Sleepy's by Sealy mattress used for 6 weeks, including a 2-week adjustment period.
- SleepScore Max (RF tech, based on full motion and respiratory signals; validated against PSG) used nightly.
- Pre-post self-report.

Analyses

- Multilevel regression accounting for nested data (nights within subjects) and paired *t*-tests.

Conclusion

- Objectively-measured sleep (WASO, deep sleep) and perceived sleep improved on the innerspring mattress compared to healthy adults' original mattresses.
- Qualitative and quantitative self-report results suggested that the intervention was perceived as comfortable.

Results

Objective Results (*n* = 757 nights)

	Observed		Estimated		
	Original Mattress	Innerspring Mattress	Constant	*beta*	*p*-value
SleepScore (0-100)	73.61	76.50	74.65	1.11	0.290
BodyScore (0-100)	79.17	82.71	79.11	1.35	0.112
MindScore (0-100)	70.07	72.89	71.87	0.33	0.792
Total Sleep Time (min)	343.37	355.66	354.20	6.52	0.303
Sleep Onset Latency (min)	23.62	20.36	20.62	-0.13	0.929
Number of Awakenings	4.76	3.80	4.81	-0.27	0.096
Wake After Sleep Onset (min)	**46.02**	**33.29**	**44.31**	**-4.82**	**0.024**
Time in Bed (min)	417.59	413.39	423.85	1.61	0.813
Sleep Efficiency	0.82	0.86	0.83	0.01	0.105
Sleep Maintenance	0.89	0.91	0.89	0.01	0.061
Light (min)	212.52	208.57	218.49	2.43	0.607
Deep (min)	**69.62**	**81.90**	**71.25**	**4.30**	**0.040**
REM (min)	61.24	65.19	64.63	0.02	0.994
% Light Sleep	54%	53%	54%	0.52	0.386
% Deep Sleep	20%	21%	20%	0.59	0.299
% REM Sleep	15%	17%	16%	-0.06	0.887
% Wake After Sleep Onset	**11%**	**9%**	**10%**	**-1.07**	**0.025**

Objective results showed that participants spent more minutes in deep sleep. They also spent fewer minutes and a lower proportion of the night awake after initially falling asleep.

Self Report Results (*n* = 990 nights)

	Observed		Estimated		
	Original Mattress	Innerspring Mattress	Constant	*beta*	*p*-value
Comfort in Bed (0-100)	54.56	80.31	54.15	29.21	<0.001
Perceived Time to Fall Asleep (min)	24.47	21.14	24.38	-4.01	0.023
Perceived # Times Woke Up	2.26	2.02	2.25	-0.32	0.003
Perceived Time Awake After Falling Asleep (min)	25.36	19.04	25.32	-8.25	<0.001
Perceived Sleep Quality (0-100)	52.84	76.95	52.49	27.71	<0.001
Feeling Well-Rested in the Morning	52.66	76.39	52.22	28.66	<0.001

Daily self-report showed greater comfort, as well as improvement in a variety of perceived sleep outcomes including falling asleep faster, waking up less often, spending less time awake after initially falling asleep, better sleep quality, and feeling more rested in the morning. Pre-post self-report also showed longer perceived duration of sleep.