

ORIGINAL ARTICLE

The Role of Balanced Diets in Promoting Sleep Efficiency: A Policy and Health Education Perspective

Sagar Ashok Bayaskar^{1*} 

Full list of author information is available at the end of the article.

ABSTRACT

Background: Balanced dietary habits are increasingly recognized as a modifiable factor influencing sleep efficiency, yet their connection to sleep quality often receives limited attention in public health contexts compared to other sleep hygiene factors such as light exposure and screen time.

Aim and Objective(s): This study aimed to explore the relationship between balanced diets, meal timing, specific food components, and sleep efficiency through qualitative insights from diverse participants, and to identify opportunities for targeted public health education and policy interventions to improve sleep outcomes and overall well-being.

Methods: A qualitative descriptive study was conducted between April and July 2025 involving in-depth semi-structured interviews with 35 participants (18 males, 17 females) aged 18–45 years from varied educational and professional backgrounds. Participants were recruited via purposive sampling to ensure diversity in education and occupation. Interviews (30–45 minutes) explored dietary habits, meal timing, food preferences, and perceived effects on sleep. Data were audio-recorded, transcribed verbatim, and analyzed using content analysis to identify patterns and variations in responses. Ethical clearance was obtained, and informed consent was secured from all participants.

Results: Participants adhering to balanced, nutrient-rich diets (adequate macronutrients and micronutrients) reported improved sleep latency, fewer nocturnal awakenings, and better subjective sleep quality, with 68% noting more restorative sleep on such days. Proper meal timing (final meal 2–3 hours before bedtime) was linked to better sleep onset and reduced restlessness, while late-night heavy, high-sugar, or processed meals caused digestive discomfort and disrupted sleep. Foods rich in tryptophan (e.g., dairy, nuts), magnesium-containing vegetables, and complex carbohydrates were perceived as beneficial; high-sugar snacks, caffeine, and processed foods near bedtime were detrimental. Only 40% of participants recognized the direct diet-sleep link, indicating low awareness.

Conclusion: Balanced diets and appropriate meal timing positively influence sleep efficiency by supporting hormonal regulation and circadian alignment. There is a clear need to integrate nutrition-based recommendations into public health education, community programs, and policy initiatives to enhance sleep health at the population level.

Keywords: Balanced diet, sleep efficiency, public health, nutrition education, meal timing, sleep quality.

Introduction

Sleep efficiency, defined as the ratio of total sleep time to time spent in bed, is a key determinant of health, productivity, cognitive function, emotional regulation, and physical restoration [1]. While factors such as light exposure and screen time have been widely studied in sleep hygiene guidelines, the role of

Correspondence to: Sagar Ashok Bayaskar

*Independent Researcher, Public Health,
Maharashtra, India.

Email: sabayaskar@gmail.com

Received: 06 September 2025 | **Revised:** 3 December 2025 |

Accepted: 12 December 2025



Table 1. Participant demographics (N = 35).

Variable	N	%
Male	18	51.4
Female	17	48.6
Age 18-25	12	34.3
Age 26-35	14	40.0
Age 36-45	9	25.7

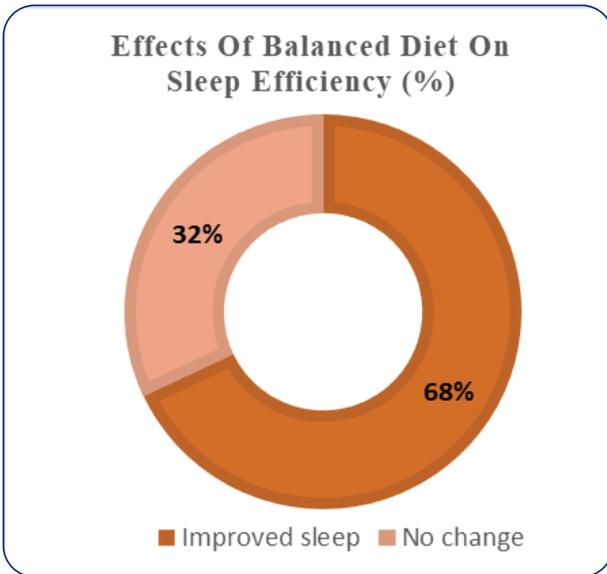


Figure 1. Reported effects of balanced diet on sleep efficiency.

nutrition has received less attention in public health messaging. Balanced diets, providing adequate macronutrients (carbohydrates, proteins, healthy fats) and micronutrients (vitamins and minerals), influence neurotransmitter production (e.g., serotonin via tryptophan), hormonal balance (e.g., melatonin), and circadian rhythm regulation—all critical for high-quality sleep [1,2].

Research indicates that nutrient composition directly affects sleep onset latency, duration, and quality. For instance, high-glycemic-index carbohydrates before bedtime can shorten sleep onset by facilitating tryptophan transport to the brain [3], while diets high in saturated fat and low in fiber are linked to lighter, less restorative sleep [4]. Micronutrients like magnesium, calcium, vitamin B6, and amino acids such as tryptophan support sleep-promoting pathways [2]. Poor habits—low vegetable intake, excessive processed sugars, and irregular eating—correlate with reduced sleep quality [5,6]. In vulnerable groups, such as the elderly, tryptophan-enriched foods improve melatonin production, serotonin synthesis, and antioxidant capacity, enhancing nocturnal sleep [7].



Figure 2. Meal timing and reported sleep quality.

The diet-sleep relationship is bidirectional: poor sleep can drive preferences for calorie-dense, nutrient-poor foods [8], and circadian disruptions from late-night eating impair metabolic and hormonal regulation [8]. Despite this evidence, the diet-sleep connection is often overlooked in favor of chronic disease prevention messaging. This study addresses this gap by examining how dietary practices influence sleep patterns among diverse adults and highlights opportunities for policy-driven nutrition education to promote better sleep health.

Methodology

This qualitative descriptive study was conducted between April and July 2025, involving 35 participants (18 males, 17 females) aged 18-45 years. Participants were recruited through purposive sampling to ensure diversity in education and occupation, including healthcare professionals, engineers, educators, and students. In-depth semi-structured interviews explored dietary habits, meal timing, food preferences, and perceived effects on sleep. Interviews lasted 30-45 minutes, were audio-recorded, and transcribed verbatim. Data were analyzed using content analysis, focusing on patterns and variations in responses without thematic coding. Ethical clearance was obtained, and informed consent was secured from all participants.

Results

Participant characteristics

A total of 35 participants (18 male, 17 female) aged between 18 and 45 years participated in the in-depth interviews. The participants represented diverse educational and professional backgrounds, including



Balanced diets and sleep efficiency

healthcare, engineering, management, science, law, education, and skilled trades. All participants were engaged in either professional employment or higher education, reflecting a range of socioeconomic contexts relevant to public health policy and education initiatives (Table 1).

Dietary patterns and sleep efficiency

Analysis of interview data revealed that participants who reported adherence to a balanced diet—defined as a daily intake comprising adequate macronutrients (carbohydrates, proteins, and healthy fats) and micronutrients (vitamins and minerals)—consistently described improved sleep latency, fewer nocturnal awakenings, and higher subjective sleep quality. Approximately 68% of participants reported experiencing more restorative sleep on days when meals were nutrient-rich, while 32% reported no significant association between dietary quality and sleep patterns (Figure 1).

Meal timing and sleep outcomes

Meal timing emerged as a critical factor influencing sleep efficiency. Participants who consumed their final meal at least 2-3 hours before bedtime reported better sleep onset and reduced episodes of night-time restlessness. In contrast, late-night heavy meals were associated with digestive discomfort, difficulty falling asleep, and increased frequency of light sleep stages, as described by 11 participants (Figure 2).

Impact of dietary components

Several participants highlighted the role of specific dietary components in enhancing or disrupting sleep quality. Foods rich in tryptophan (e.g., dairy, nuts, and turkey), complex carbohydrates, and magnesium-containing vegetables were perceived as beneficial for sleep initiation and continuity. Conversely, high-sugar snacks, caffeinated beverages, and processed fast foods consumed close to bedtime were consistently linked to delayed sleep onset and reduced deep sleep phases.

Public health awareness gaps

While most participants understood the general importance of diet for physical health, only 40% recognized its direct role in regulating sleep efficiency. Many reported a lack of targeted health education messages linking balanced diets to sleep, suggesting a gap in public health communication strategies.

Discussion

This study reinforces existing evidence that balanced diets positively influence sleep efficiency, particularly when paired with proper meal timing [1,2]. Nutrient-rich foods support hormonal and circadian mechanisms, while high-sugar, processed, and late-night heavy meals disrupt sleep cycles through digestive issues and altered neurotransmitter activity [3,4,5,8]. The perceived benefits of tryptophan-rich, magnesium-

containing, and complex carbohydrate foods align with prior findings on sleep-promoting nutrients [2,7]. The bidirectional nature of diet and sleep—where poor sleep exacerbates unhealthy eating, and irregular timing impairs regulation—further underscores the value of integrated approaches [8].

Critically, low awareness (only 40% recognized the link) highlights a major gap in public health communication. Nutrition-focused sleep hygiene education remains underutilized. Incorporating dietary guidance into workplace, school, and community programs could offer cost-effective, sustainable improvements in population-level sleep health and well-being.

Limitations

The study relied on self-reported sleep patterns, which may be subject to recall bias. The sample size was limited to a single geographic area, potentially restricting generalizability. No objective sleep measures (e.g., polysomnography) were used.

Future Implications

Future studies should use longitudinal designs and objective sleep measurements to establish causality. Research on community-based nutrition-sleep education programs could assess policy impact.

Conflicts of interest

The author declares that there is no conflict of interest regarding the publication of this article.

Funding

None declared.

Consent to participate

Informed consent was obtained from all the participants.

Ethical approval

Ethical clearance was obtained from the Institutional Ethics Committee of the Datta Meghe Institute of Higher Education and Research, Wardha (Reference no. DMIHER(DU)/IEC/2025/795). Informed consent was obtained from all participants.

Disclaimer

The views expressed in this manuscript are those of the author and do not represent an official position of any institution or funder.

Author contributions

Sagar Ashok Bayaskar: Conceptualization, methodology, data collection, analysis, writing – original draft, writing – review and editing.



Author detail

Sagar Ashok Bayaskar¹

1. Independent Researcher, Public Health, Maharashtra, India.

References

1. St-Onge MP, Mikic A, Pietrolungo CE. Effects of diet on sleep quality. *Adv Nutr.* 2016;7(5):938–49. <https://doi.org/10.3945/an.116.012336>
2. Peuhkuri K, Sihvola N, Korpela R. Diet promotes sleep duration and quality. *Nutr Res.* 2012;32(5):309–19. <https://doi.org/10.1016/j.nutres.2012.03.009>
3. Afaghi A, O'Connor H, Chow CM. High-glycemic-index carbohydrate meals shorten sleep onset. *Am J Clin Nutr.* 2007;85(2):426–30. <https://doi.org/10.1093/ajcn/85.2.426>
4. Grandner MA, Jackson N, Gerstner JR, Knutson KL. Sleep symptoms associated with intake of specific dietary nutrients. *J Sleep Res.* 2014;23(1):22–34. <https://doi.org/10.1111/jsr.12084>
5. Bravo R, Matito S, Cubero J, Paredes SD, Franco L, Rivero M, et al. Tryptophan-enriched cereal intake improves nocturnal sleep, melatonin, serotonin, and total antioxidant capacity in elderly humans. *Age (Dordr).* 2013;35(4):1277–85. <https://doi.org/10.1007/s11357-012-9419-5>
6. Katagiri R, Asakura K, Kobayashi S, Suga H, Sasaki S. Low intake of vegetables, high intake of confectionery, and unhealthy eating habits are associated with poor sleep quality among middle-aged female Japanese workers. *J Occup Health.* 2014;56(5):359–68. <https://doi.org/10.1539/joh.14-0081-OA>
7. Frank S, Gonzalez K, Lee-Ang L, Young MC, Tamez M, Mattei J. Diet and sleep physiology: public health and clinical implications. *Front Neurol.* 2017;8:393. <https://doi.org/10.3389/fneur.2017.00393>
8. Gonnissen HK, Rutters F, Mazuy C, Martens EA, Adam TC, Westerterp-Plantenga MS. Effect of a phase advance and phase delay of the 24-h cycle on energy metabolism, appetite, and related hormones. *Am J Clin Nutr.* 2013;96(3):689–97. <https://doi.org/10.3945/ajcn.111.018143>

