

# Factors that Affect Sleep in Undergraduate Nursing Students

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*Nursing students are at increased risk for sleep deprivation and adverse sleep outcomes, and this can pose negative health consequences for students and safety risks for patients. To better understand where to place time, energy, and resources to improve sleep outcomes for prelicensure undergraduate nursing students, a scoping literature review was conducted to study the research question: What are the major contributing factors to adverse sleep outcomes in undergraduate nursing students? Eight articles met inclusion criteria and were organized into four themes of contributing factors: 1) Stress and Mental Health, 2) Technology Use, 3) Health Behaviors, and 4) Obligations to Work and School. Sleep is increasingly recognized as important to health across the lifespan, and findings indicate coping strategies, digital addiction, lifestyle behaviors, and burnout as major areas for improvement among prelicensure undergraduate nursing students. These findings are relevant and timely for academic advisors, faculty, administrators, staff, and institutions seeking evidence-based strategies to improve sleep, success, and safety for students and their patients. It is essential to explore these contributing factors as part of a larger effort to discover the most effective strategies for improving nursing students' health and well-being as they prepare for the demanding field of nursing.*

## Introduction

Professional nurses face significant physical, psychological, and emotional demands in the workplace. Promoting the health of nurses is crucial because their well-being directly impacts patient progress, healthcare costs, and the overall sustainability of the healthcare system. A healthy nurse is more effective in providing high-quality care, reducing medical errors, and promoting positive patient outcomes. Specifically, nursing students are at a critical point in development as they learn how to best mediate stress and maintain healthy habits. Sleep is an essential part of healthy living as well as growth and development, and yet 89.1% of prelicensure baccalaureate nursing students identify themselves as poor sleepers (1). Such findings are alarming, with the lack of sleep contributing to poor physical and mental health outcomes for nurses and potential safety risks for patients. Thus, the purpose of this literature review is to describe the major contributing factors to reduced sleep outcomes in prelicensure undergraduate nursing students in the United States. It is essential to explore these contributing factors in order to unveil the most effective strategies for improving nursing student health and well-being as they prepare for the demanding field of nursing.

Sleep is a fundamental human need, crucial for both physical and mental well-being. Several components, including sleep quality, daytime sleepiness, sleep hygiene, and sleep disturbance, are essential to measuring and understanding the complex nature of sleep health. Sleep quality is defined as “an objective concept associated with

factors such as sleep duration, sleeping and waking times, time to fall asleep, feeling rested when waking up, sleep fragmentation, frequency of nightmares, and daytime sleep” (2-4). Daytime sleepiness “leads to uncontrolled falling asleep during the day, inability to maintain alertness, involuntary drowsiness, and inability to be attentive while performing daily activities” (4, 5). Meanwhile, the Health Measures PROMIS Sleep Disturbance tool defines sleep disturbance as “self-reported perceptions of sleep quality, sleep depth, and restoration associated with sleep rather than specific sleep disorders” (3). Lastly, sleep hygiene is the “routine of practicing habits that promote good sleep quality leading to daytime alertness” (1, 6). Preserving sleep quality, minimizing daytime sleepiness and sleep disturbance, and improving sleep hygiene is vital to maintaining holistic health and preventing workplace injury or motor vehicle collisions. In practice, nurses require an extra level of alertness, attentiveness, and critical thinking due to the high-impact nature of their job. If these are compromised due to inadequate sleep, they may be more likely to make medical errors that can severely jeopardize patient safety.

Nursing students are at increased risk of suffering complications related to sleep disturbances, sleep quality, and daytime sleepiness due to the restraints and burdens of the college environment. The National Sleep Foundation recommends 7-9 hours of sleep per night for adults (7), in contrast to nursing students who sleep less than 7 hours and have poor sleep quality (1). In addition to the challenges faced by all college students, including the rigors of classroom education, extracurricular requirements,

social pressures, and professional expectations, nursing students also experience the stress of skills labs, weekly patient care clinicals, frequent evaluations of professional behaviors, written plans, and examinations. During patient care labs, nursing students are asked to assess living standardized patients, work on learning mannequins, and interface with technology, all while being video recorded by instructors in order to debrief delivery of care. Frequently, these lab sessions are graded for content of professional behavior, timeliness of assessment, prioritization of patient problems, interaction with standardized patients, skill acquisition, and delivery of safe care. Nursing student labs can include childbirth, infants with respiratory distress, aggressive family members, patients experiencing hallucinations, or resuscitation codes.

During weekly clinicals in healthcare settings, students may wake up before 5am to drive their peers to unfamiliar hospitals. The stress of transportation and parking, anxiety of adjusting to different expectations of clinical instructors, and concern for patient safety during hospital shifts may inhibit their mental and physical health. An additional concern is that these experiences take place in an environment of heightened social media use on college campuses. According to Charlton and Wofford, the literature reveals many maladaptive coping behaviors in undergraduate nursing students, including depression, anxiety, and sleep disturbances (8). Sleep disturbances are correlated with impaired psychological health, as well as substance use, self-harm, and reduced academic performance (8). Thus, it is necessary to explore the relationships between sleep disturbance, sleep quality, and daytime sleepiness in order to improve sleep hygiene and positive coping behaviors in nursing students. The research question this literature review aims to answer is: What are the major contributing factors to adverse sleep outcomes in undergraduate nursing students? In the study, sleep outcomes include impaired sleep quality, daytime sleepiness, and sleep disturbance, and hypothesized contributing factors include competing stressors and obligations, anxiety or depression, technology, and health routines. Analysis of these factors may reveal the major areas of growth that warrant focused effort in research, policies, education, and wellness to improve the sleep of future nurses.

### Methods

A scoping literature review was conducted in January and February of 2023 through the Cumulative Index to Nursing and Allied Health Literature (CINAHL) database. Additional articles were identified through other sources, such as grey literature and article reference lists. All articles obtained through the search terms were reviewed by title and abstract by the author for eligibility.

Studies were included if they met the following criteria: (1) the study focused on sleep, (2) included nursing students, and (3) was published in a peer-reviewed journal. Eligible articles were screened using the abstract and the full text. Any uncertainty was resolved through discussion with the faculty mentor.

There were 114 articles found using a combination of keywords (“nursing students,” “sleep deprivation,” “sleep hygiene,” “sleep behavior,” and “reduced sleep”). Articles were removed if not written in the last 5 years, yielding 70 remaining articles. When the search terms were refined to undergraduate nursing students rather than students in other degree programs and written in English, the number of articles decreased to 10 records. Studies that were duplicates or did not provide a narrowed focus to the factors influencing the sleep of nursing students were removed, leaving a final sample of 8 articles that were analyzed for this paper (Figure 1 - PRISMA). Secondary references from these articles provided added value and broadened context for this review.

### Results

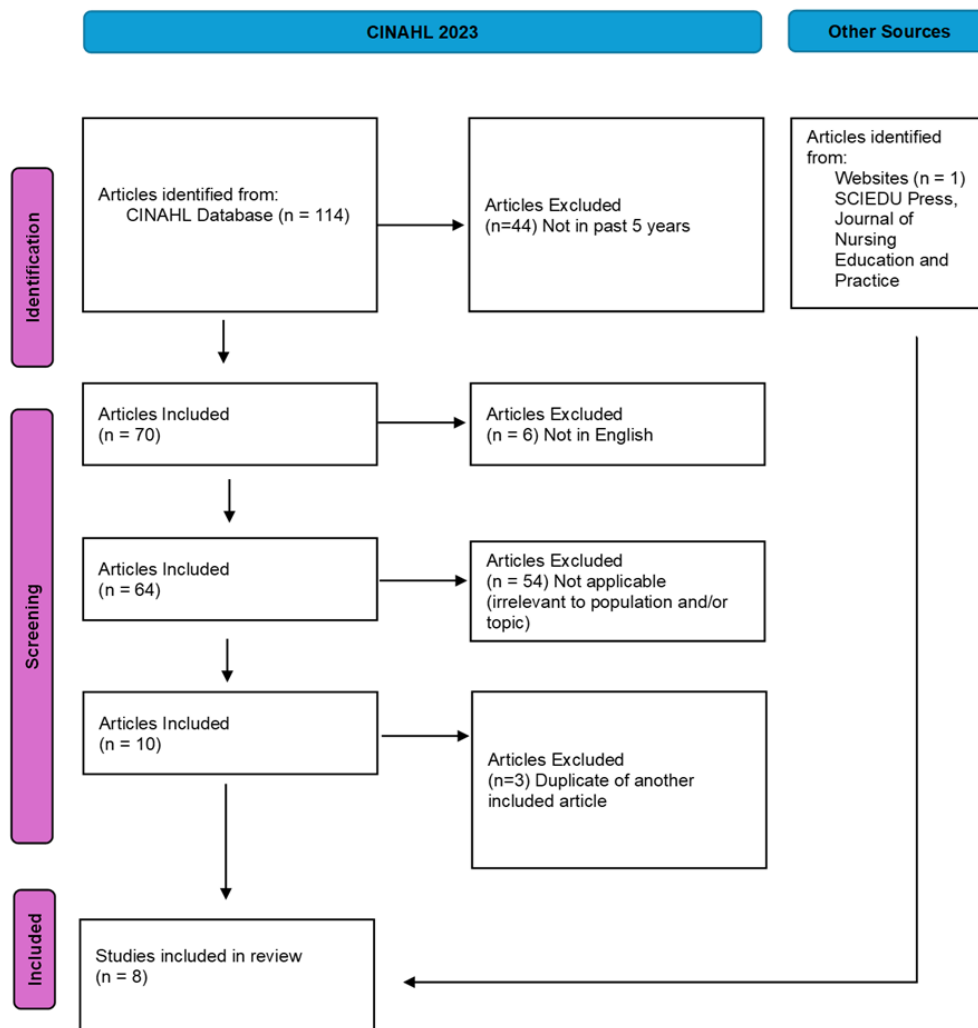
Most of the studies included in the final analysis were quantitative, cross-sectional, and non-experimental (6, 8). One study (10) included a longitudinal repeated measures design with wrist monitors and sleep diaries, and another was descriptive, addressing quantitative data from Likert scores in addition to open-ended questions (11). There were no randomized controlled trials in the sample.

In the following articles, sleep quality is typically measured using the Pittsburgh Sleep Quality Index (PSQI), daytime sleepiness with the Epworth Sleepiness Scale (ESS), and sleep hygiene with the Sleep Hygiene Index (SHI). However, additional data collection methods, including the Digital Addiction Scale, Insomnia Severity Index, Maslach Burnout Inventory, and student-based scales or open-ended questions, are also used and can be found in the Table of Evidence.

In reviewing the literature to explore major contributing factors, four themes were discovered: 1) mental health, 2) technology use, 3) health behaviors, and 4) obligations to work, family, and school. Each theme will be analyzed individually for its effect on sleep in undergraduate nursing students.

#### **Theme 1: Stress & Mental Health**

The majority of studies in this review (n=6) included a focus on how the mental health status of undergraduate nursing students not only influences academic performance but plays a significant role in sleep. Blome and colleagues found that although over 50% of students rated their own sleep quality as fairly good, the



**Figure 1. PRISMA Diagram.**

From: Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. *BMJ* 2021;372:n71. doi: 10.1136/bmj.n71  
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mean sleep duration was less than seven hours and total PSQI scores indicated poor sleep quality (1). Given the National Sleep Foundation recommendation of 7-9 hours of sleep per night, this highlights a potential knowledge gap in what defines good sleep quality and quantity. It also demonstrates the need to investigate how sleep hygiene may contribute to these reduced scores (7). Accordingly, one of the highest reported scores on the Sleep Hygiene Index was thinking, planning, or worrying while in bed (30.7% frequently, 31.5% always; 1, Figure 3). Therefore, it is essential to consider how the mental status of nursing students, whether that be chronic stress and anxiety or simply continued thoughts and plans from the day, may diminish the state of rest needed for a quality night's sleep.

Furthermore, it is not only mental health status itself, but the coping strategies that accompany stress and anxiety that affect sleep outcomes. Evidence suggests that

problem avoidance, self-criticism, and social withdrawal during times of peak stress may reduce sleep quality, contribute to depression, and pose a risk to nursing students' self-efficacy (12, 10, Figure 3). As depicted in Figure 2, negative coping strategies' impact on sleep may cause a positive feedback loop in which negative coping strategies impair sleep quality, thereby increasing stress and continuing the negative cycle. Meanwhile, when students exhibit problem engagement (problem solving and cognitive restructuring), they exhibit reduced depressive symptoms (12).

### **Theme 2: Technology Use**

In responding to the reduced sleep outcomes of nursing students in an increasingly digital age, it is vital to address the contributing factor of screen time exposure.

Blome and colleagues found that technology use, along with work and classes, significantly influences sleep hygiene (13). As depicted in Figure 3, previous research emphasizes that 31.9% of undergraduate nursing students report the use of electronics into the night as a reason for losing sleep (1).

Additionally, technology-associated reduced sleep outcomes may also be related to addictive behaviors to electronic devices. Research reveals a significant and positive relationship between the mean Sleep Disturbance (SD) T-scores and Digital Addiction (DAS) scores (14). The authors also reported that most students use their digital devices over three hours a day, with a 42.4% prevalence of smartphone addiction in undergraduate nursing students and a majority with poor sleep quality (14, Figure 3). Not only does light exposure affect sleep, but the sheer number of hours that undergraduates spend on their phones may correspond to addiction and thus reduced sleep outcomes (4,14). Phone addiction may also be an example of problem avoidance within negative coping, and this may compound the mental health consequences that inhibit quality sleep.

### Theme 3: Health Behaviors

In addition to stress and technology use, the literature reveals that daily health habits related to sleep hygiene have significant ramifications for undergraduate nursing students. For example, in addition to technology use, caffeine and alcohol consumption were the most significant factors related to sleep hygiene (13). Blome and colleagues state that the more caffeine and energy drinks undergraduate nursing students consume, the greater their reduction in sleep quality (1). Interestingly, these behaviors were not significantly related to daytime sleepiness, which may be accounted for through the stimulants throughout the day (1, 11). However, the Thomas et al. study, which includes students from across the United States, found an overall negative impact of sleep/wake aids on personal and patient safety (11). If nursing students continue to rely on caffeine and alcohol in excess post-graduation, this can threaten their ability to safely care for patients. Furthermore, Blome et al. found that the highest reported



**Figure 2. Negative Coping Feedback Loop.** This figure depicts the cyclical relationship of stress, coping skills, and sleep outcomes within the Stress & Mental Health theme.

scores for the Sleep Hygiene Index were using the bed for activities other than sleeping, such as studying (1). Both substance use and the physical environment can play a major role in students' ability to achieve a quality night's rest and are highlighted in Figure 3.

Meanwhile, James and colleagues indicated that throughout the trajectory of a clinical rotation, "sleep quality did not vary, yet self-reported sleepiness increased over the semester and predicted lower self-efficacy scores" (10). These findings may reveal that caffeine use tends to diminish sleep quality, while clinical

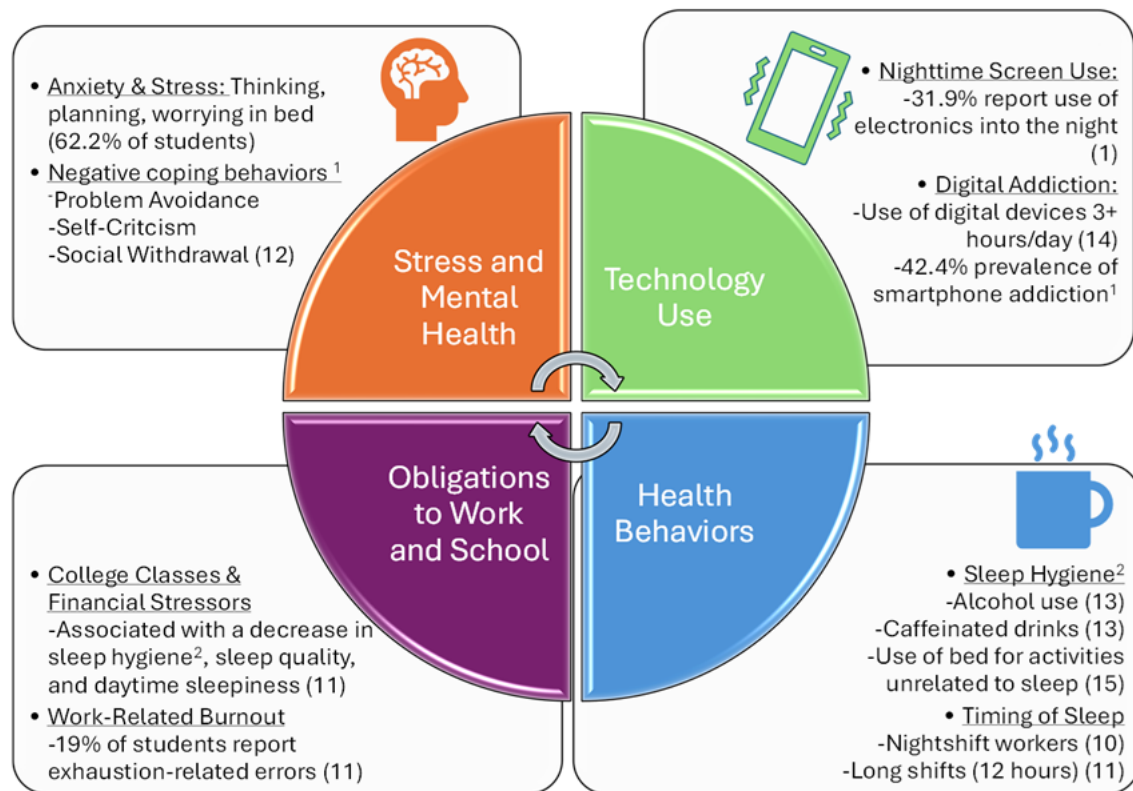
stressors tend to increase daytime sleepiness. These stressors often begin before the shift and persist after the shift, and are likely only heightened by the use of caffeine.

Moreover, the absence of regular bedtimes is a major factor in the severity of insomnia (15). James and colleagues add that the timing of sleep may be related to sleepiness, which points to a need for additional interventions for nursing students who work the night shift (10, p. 550, Figure 3). Additionally, in the Thomas et al. study, over half of the respondents disagreed with the statement, "I believe 12-hour shifts pose no risk of patient or personal safety issues for my clinical nursing experiences," which highlights a potential safety risk associated with working long shifts (11). This risk is likely related to deficient rest needed for adequate physical and mental functioning of student nurses.

### Theme 4: Obligations to Work, Family, and School

Curricular and extracurricular commitments comprise the fourth theme of contributing factors that lead to negative sleep outcomes in nursing students. As identified in Figure 3, student obligations to college classes and finances for food were inversely correlated with all three desired sleep outcomes for sleep hygiene, sleep quality, and daytime sleepiness (13). Although limited in its generalizability due to the use of a convenience sample, this finding reveals the extensive impact that college classes and financial stressors may have on sleep and illuminates a need for holistic stress reduction strategies.

Specifically, the study by Thomas et al. reveals a



**Figure 3. Overview of Results from 4 Themes.** This figure depicts the major findings regarding factors affecting sleep in nursing students, sorted by color into themes

relationship between student obligations and burnout, which negatively impacts sleep (11). In this research, over half of nursing student respondents replied “sometimes,” “often,” or “always,” to the statement, “I have worked more than 8-hours in a 24-hour period at my job prior to a didactic class or nursing clinical experience” (11). Not only is student health a concern, but so is patient safety, as around 19% of students also indicated that they made an error related to being exhausted during clinical (11). Additionally, Atkan and colleagues found a moderate level of burnout in undergraduate nursing students, with a positive correlation between exhaustion/cynicism and sleep quality and the severity of insomnia (15). Although conducted in Turkey and therefore limited in its generalizability to the United States, these findings add to previous research by underscoring the idea that undergraduate nursing students feel burdened by the extent of their obligations (11, 13, 15). Importantly though, the exhaustion they experience actually decreases, rather than increases, their sleep outcomes. The burden of responsibilities and the related exhaustion and cynicism must be targeted when addressing the best solutions to insomnia and sleep disturbances.

### Discussion

Research articles from this literature review

provide extensive evidence to uphold the complex problem of reduced sleep outcomes in undergraduate nursing students. The studies exhibit many strengths, including the consideration of confidentiality and the notation of Institutional Review Board approval. Many of the sources also indicate the reliability and validity of instruments such as the PSQI or ESS questionnaires. Since the study completed by James and colleagues uses longitudinal design and biometric data, it may provide more robust evidence than other descriptive studies (10). However, none of the sources provide evidence higher than Level IV and many involve the use of a convenience sample. Therefore, causal relationships cannot be drawn, and the representation of the samples may be limited. This is especially true for the Turkish studies which are limited in generalizability (4, 14, 15). Uzuncakmak et al. found that students in rural areas have reduced sleep quality, so the role of location on sleep should certainly be investigated further, especially within the United States (1, 4, 13). To increase generalizability, more researchers should follow the example of Thomas et al. in assessing nursing students from across the United States rather than one specific region (10, 11). The use of random selection and control groups may also be useful to move toward causation rather than mere correlation between factors related to sleep in undergraduate nursing students.

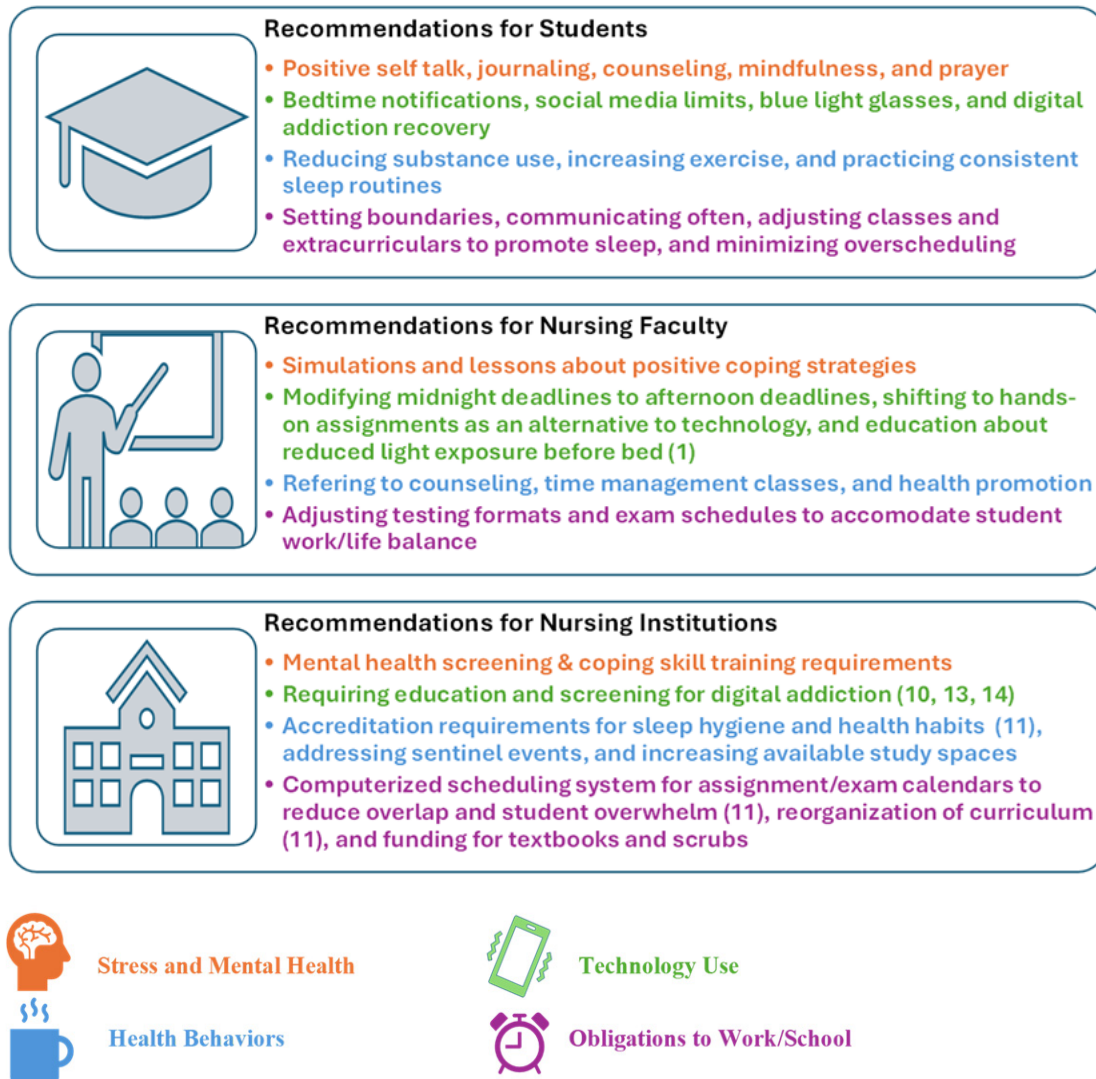
Recommendations for each sleep factor should address various levels of influence to include students, nursing faculty, and nursing institutions. These recommendations are summarized visually in Figure 4. Within the domain of mental health, students may benefit from mindfulness and mediation as example strategies to regulate emotions (12). Other strategies may include positive self-talk, journaling, counseling, cognitive behavioral therapy, and prayer. Nursing faculty may support student resilience through simulations in skills labs about positive coping strategies, time management, and stress reduction techniques (1). Since insomnia may frequently be heightened the day before a clinical rotation (13), it may be beneficial for faculty to reduce the number of assignments such as care plans due the morning of clinical, or include calming group exercises as part of the morning briefing (11). Before embarking on significant changes, though, it is essential to prioritize the need to learn from students about what aspects of nursing school can be modified so solutions are personalized to students' unique needs. To best support students who may have more complex mental health needs, institutions should standardize screenings for depression, anxiety, OCD, and other psychological conditions and refer to the appropriate services.

In the realm of technology use, students may improve their sleep by reducing light exposure before bed (1) through interventions such as bedtime notifications, social media limits, or blue light glasses (Figure 4). Adjustable phone settings may shut off certain apps or change the color of the screen to support a wind-down period before bed. Other students may find it helpful to keep the bed as a phone-free zone and elect to read or write in a journal before sleep. Faculty can promote these goals through the use of guest lecturers, professional development opportunities, or a curriculum that includes an emphasis on holistic health and sleep hygiene. Additionally, shifting deadlines to the afternoons rather than midnight may help students budget time so that they are not using computers late into the night (Figure 4). With technology being an increasingly favored medium for academic and clinical preparation, it is necessary not only to educate but also to further study technology's effects on sleep and promote culturally appropriate strategies for success (10, 13, 14). Since over one-third of nursing students in the Atkas et al. study experience digital addiction, it is crucial that counseling and addiction recovery resources are promoted throughout nursing schools (14). Just as with any addiction, primary, secondary, and tertiary prevention should be used to address digital addiction from its earliest to most severe forms.

In regard to health habits, students may improve their sleep outcomes through simple changes such as reducing use of substances such as alcohol and caffeine or practicing consistent sleep routines. Nursing students

should not only ensure they are beneath the max safe dose of 400 milligrams of caffeine per day, but should also stop drinking caffeinated drinks such as soda, tea, coffee, or energy drinks within 8 hours before bedtime (14). The National Sleep Foundation also emphasizes that morning light exposure is essential to promoting the body's natural circadian rhythm, and regular exercise can increase the body's ability to sleep. If naps are needed, limiting nap times to 20 minutes may increase energy without impairing sleep (14). Other sleep hygiene recommendations include dimming lights, lowering the thermostat to around 65 degrees Fahrenheit, using 30 minutes before bed for music, stretching, reading, or relaxation, and avoiding heavy or spicy meals immediately before sleep (15). If insomnia is experienced after 20 minutes, it is important to get out of the bed and continue a calming activity in another location (15). Faculty can promote these health behaviors through referring students to coaching within the health center or health promotion for topics related to sleep, exercise, nutrition, or substance use. They may also choose to incorporate lessons on sleep hygiene, caffeine management, or other health topics into their curriculum, while nursing advisors may support students in structuring personalized schedules that meet their wellness needs (1). This being said, over 70% of nursing student participants already acknowledge that their nursing faculty are addressing the need for sufficient sleep, but the education was found to be ineffective (11). Thus, more holistic strategies that encompass physical exercise, massage, or counseling may be needed (11). Surveys and conversations with nursing students may reveal which of these teaching strategies are most successful and help to foster a stronger culture of health and wellness in the nursing school community. On a broader scale, institutions should address sentinel events related to sleep impairment in the clinical and academic settings, and require nursing students to submit personal schedules that support adequate sleep (11). Furthermore, given that Thomas and colleagues critique the lack of consistency among nursing schools in addressing the chronic use of sleep-related substances, building sleep hygiene into a national accreditation process may be an important next step (11, Figure 4). More available study spaces within residence halls and nursing buildings may be necessary to support nursing students with studying outside of their bedrooms, thus promoting sleep (Figure 4).

Finally, the burden of obligations and their negative impact on sleep can be mitigated with essential skills such as setting boundaries and communicating effectively with peers, faculty, extracurriculars, managers, families and friends. Students may benefit from coaching sessions on how to minimize overscheduling and practice prioritization in their personal, academic, and professional lives. Academic advisors should refer students to counseling



**Figure 4. Recommendations.** This figure organizes recommendations for students, faculty, and institutions by theme.

centers, student health, or time management classes, and should mentor students to prepare academic and personal schedules that best accommodate consistency and holistic wellness. Faculty may also reduce student stressors by decreasing the number of group projects or multiple assignments due within the same time period, or increasing hands-on, non-graded assignments that allow students to remain focused and engaged without feeling overly weighed down when they leave class (Figure 4). Thomas and colleagues also suggest coordination with faculty to decrease incidences of multiple exams on the same day, as this may help students to balance their studying rather than sacrifice their sleep for a good grade (11). For instance, a computerized scheduling system in which professors input their assignment/testing calendars ahead of time may benefit both professors and students by synchronizing topics, reducing stress, and improving retention (Figure 4).

Other examples of systemic interventions may include setting limits on how many credits nursing students can take at a time or reorganizing the nursing school curriculum, so the most difficult courses are spread out across semesters (11). To reduce financial stress on students, institutions can provide scholarships and funding for textbooks, scrubs, and other required items (Figure 4). More research is needed in each of these areas to determine whether such solutions are effective nationwide or whether they need to be personalized to individual students or institutions.

In conclusion, it is important to emphasize that the stress undergraduate pre-licensure nursing students undergo is likely to permeate into the nursing profession. Equipping students during their education with the tools of self-awareness and mindfulness may help them to respond appropriately when facing mental health difficulties, digital addiction, unhealthy lifestyle behaviors, or burnout in

their academic settings and nursing careers. Students, professors, advisors, and institutions can proactively work together to communicate needs, establish goals, and develop courses of action that optimize sleep within the larger context of mental, social, technological, physical, and spiritual health as well as academic success. After all, continuous team-based interventions ensure students do not feel they must choose between health and competing obligations to work and school. Creative strategies are essential not only to supporting successful sleep but to improving the overall well-being of America's most trusted profession and ensuring the safety of the patients served. There is no better time to awaken the public to the urgency and risk of sleep-impaired student nurses—the nation's future caregivers.

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