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Research Article

Development and Preliminary Psychometric Properties of the Adolescent Sleep Health Belief Scale

Hasret Dikici[1], Hasibe Kadıoğlu[2]

[1]Department of Public Health Nursing, Marmara University Institute of Health Sciences, İstanbul, Türkiye
[2]Department of Nursing, Fenerbahçe University Faculty of Health Sciences, İstanbul, Türkiye

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What is already known on this topic?

- *Sleep problems are associated with numerous negative outcomes.*
- *Accurately and comprehensively evaluating the conditions and behaviors affecting health beliefs to meet the need for quality and adequate sleep can guide the planning of effective interventions.*
- *There is no sleep scale developed based on the health belief model in the literature.*

What this study adds on this topic?

- *A new scale, called the Adolescent Sleep Health Belief Scale, has been developed to evaluate adolescents' beliefs about sleep.*
- *The scale comprises 46 items across six sub-factors and has demonstrated good validity and reliability in adolescents.*
- *This scale can be used in both practical and research settings to assess adolescents' beliefs about sleep.*

Abstract

AIM: This study aimed to develop a scale based on the Health Belief Model that can reliably and validly evaluate adolescents' beliefs toward sleep.

METHODS: This study was conducted using a methodological design with 494 adolescents between September and October 2022 in Antalya, Türkiye . Eighty-one items about sleep were created according to the Health Belief Model. Validity was assessed in terms of content and construct validity, and reliability was assessed through internal consistency. Content validity was evaluated by ten expert opinions. The scale was tested for construct validity with exploratory factor analysis, after which the scale's reliability was evaluated by examining item-total correlations using Pearson's correlation analysis and assessing internal consistency with Cronbach's Alpha.

RESULTS: Item-level content validity index scores ranged between 0.80 and 1. The scale-level content validity index value was found to be 0.94. In the exploratory factor analysis of the 46-item scale, six factors were found with an eigenvalue greater than 1, explaining 57.7% of the total variance. The scale's item-total correlations ranged from 0.26 to 0.79. Cronbach's alpha coefficients for the subscales were 0.92 for perceived susceptibility, 0.90 for perceived severity, 0.90 for perceived benefits, 0.81 for self-efficacy, 0.79 for motivation, and 0.69 for perceived barriers.

CONCLUSION: The Adolescent Sleep Health Belief Scale demonstrated good validity and reliability in adolescents. Its cross-cultural adaptation for use with adolescents in other countries is recommended.

Keywords: Adolescents, health belief model, sleep

Introduction

Adolescence is a critical period characterized by rapid biological, psychological, and social changes. During this phase, the development and maintenance of healthy living habits are of paramount importance. Among the fundamental needs in Maslow's hierarchy and a core concept in all nursing theories, sleep is a crucial necessity for the physical and mental health of adolescents. However, adolescents often experience short sleep durations and poor sleep quality, leading to significant risks to their physical and emotional health, academic performance, and safety (Owens et al., 2014). Research has shown that sleep problems are associated with numerous negative outcomes (Sletten et al., 2023). For instance, sleep problems are linked to increased body fat mass (Bailey et al., 2014), obesity (Häusler et al., 2020; Nicholson et al., 2021), lower cognitive performance (Lim et al., 2012), poorer academic performance (Okano et al., 2019), reduced visual attention performance (Zhang et al., 2020), disrupted eating patterns (Lotfi et al., 2015), insulin resistance (Taylor et al., 2016), anxiety (Kim et al., 2022), and suicide (Liu, 2004; Bernert et al., 2017). To prevent these problems, schools should be viewed as opportunity areas for promoting sleep health, and effective preventive interventions should be implemented (Sağlan &

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Corresponding author: Hasibe Kadıoğu,
E-mail: hkadioglu@marmara.edu.tr

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Bilge, 2018; Inhulsen et al., 2023). Preventive interventions involve changing or improving behavior. Various models have been used for many years to promote and develop health behaviors. The Health Belief Model (HBM) is one of the widely used models in understanding and changing health behaviors. This model posits that individuals' health-related attitudes and beliefs influence their health behaviors. According to HBM, individuals' health behaviors are guided by components such as perceived susceptibility, perceived severity, perceived benefits, and perceived barriers (Glanz et al., 2015). In this context, the success of interventions aimed at improving sleep habits may depend on understanding and changing adolescents' beliefs and attitudes toward sleep (Gao et al., 2023). A study examining the relationship between health beliefs and sleep quality found that health beliefs could enhance the sleep quality of university students. In this relationship, physical activity was identified as a mediating factor; that is, health beliefs improve sleep quality by increasing students' physical activity levels. Moreover, as cell phone addiction decreases, the positive effects of health beliefs and physical activity on sleep quality become more pronounced (Gao et al., 2023). Accurately and comprehensively evaluating the conditions and behaviors affecting health beliefs to meet the need for quality and adequate sleep can guide the planning of effective interventions. In this regard, developing scales based on the HBM will enable a better understanding of adolescents' attitudes and beliefs towards sleep health and enhance the success of interventions in this area.

The aim of this study is to develop a reliable and valid scale to evaluate adolescents' beliefs about sleep within the framework of the Health Belief Model. This scale can be an important tool in understanding adolescents' sleep behaviors and implementing interventions to improve sleep quality.

Methods

Study Design

This is a methodological study

Sample

The scale was administreted to 509 tenth-grade students at a high school in Antalya, Türkiye for psychometric evaluation. It is generaly recommended to include between 5 and 10 participants per item for factor analysis (Kyriazos, 2018). The initial version of the scale consisted of 81 items, and thus, the required sample size was estimated to be between 405 and 810 participants. A total of 509 participants were included in the study, which meets the recommended criteria for scale development and validation.

Data Collection

The scale was applied in the classroom environment using the self-report method.

Stage 1: Development of the Scale Items

Since the early 1950s, the HBM has been one of the most widely used models in health behavior research, both to explain the change and maintenance of health-related behaviors and as a guiding framework for health behavior interventions. Additionally, there are many HBM-based scale development studies (Çiftci & Kadioğlu, 2020). In this study, 83 scale items were created in accordance with the structure of the health belief model. Initially, the sub-dimensions of the model, including perceived susceptibility, perceived severity, perceived benefits, perceived barriers, self-efficacy, and motivation, were thoroughly examined. Items were created to represent each of these sub-dimensions, with new statements developed according to the conceptual framework of the model. In this way, a comprehensive item pool was formed to effectively and evenly measure participants' health beliefs. During the item development process, clear and understandable expressions were prioritized, considering the conceptual structure of each component (Figure 1)

Twenty items were created for perceived susceptibility, 13 for perceived severity, 15 for perceived benefits, 15 for perceived barriers, 12 for motivation, and 8 for self-efficacy. The scoring of items was determined as a 5-point Likert scale: Strongly agree (5), agree (4), undecided (3), disagree (2), and strongly disagree (1). The perceived barrier items were reverse-coded.

Stage 2: Content Validity

For content validity, expert opinions were gathered from a total of 10 individuals, including 3 professors, 1 associate professor, and 3 assistant professors in the field of Public Health Nursing, as well as 3 nurses with a master's degree in Public Health Nursing. According to Lynn (1986), a minimum of 6–10 experts is considered adequate for assessing content validity. Therefore, the number of experts consulted in the study is within the acceptable range. Both the Item-Level Content Validity Index (I-CVI) and the Scale-Level CVI (S-CVI) were calculated based on their evaluations. The experts were asked to evaluate each item on the scale both qualitatively and quantitatively. Quantitatively, the experts rated each item on a scale from 1 to 4, where 1 indicated "not suitable," 2 "needs to be made suitable," 3 "suitable but needs minor changes," and 4 "very suitable."

Stage 3: Psychometric Assessment

, (Kyriazos, 2018 At this stage, the validity of the scale was evaluated through exploratory factor analysis (EFA), while its reliability was assessed using internal consistency (Cronbach's alpha), item-total correlation, and split-half reliability analyses.

Statistical Analysis

The data were analyzed using IBM SPSS version 21.0 (IBM SPSS Corp.; Armonk, NY, USA) software. For content validity, the CVI was used; for internal consistency, Cronbach's Alpha Coefficient was used; for item analysis, Pearson Correlation Analysis was employed; and for construct validity, EFA was utilized. The EFA was conducted using principal components analysis with oblique rotation. The CVI was calculated at both the item level and the scale level. At the item level, CVI was obtained by dividing the number of experts who rated an item as three or four by the total number of experts. At the scale level, the CVI was the arithmetic mean of the item-level CVIs. An I-CVI value of 0.78 or higher is generally considered acceptable, indicating adequate content validity for that item. An S-CVI/Ave value of 0.90 or above is typically regarded as demonstrating excellent content validity for the whole scale (Lynn, 1986).

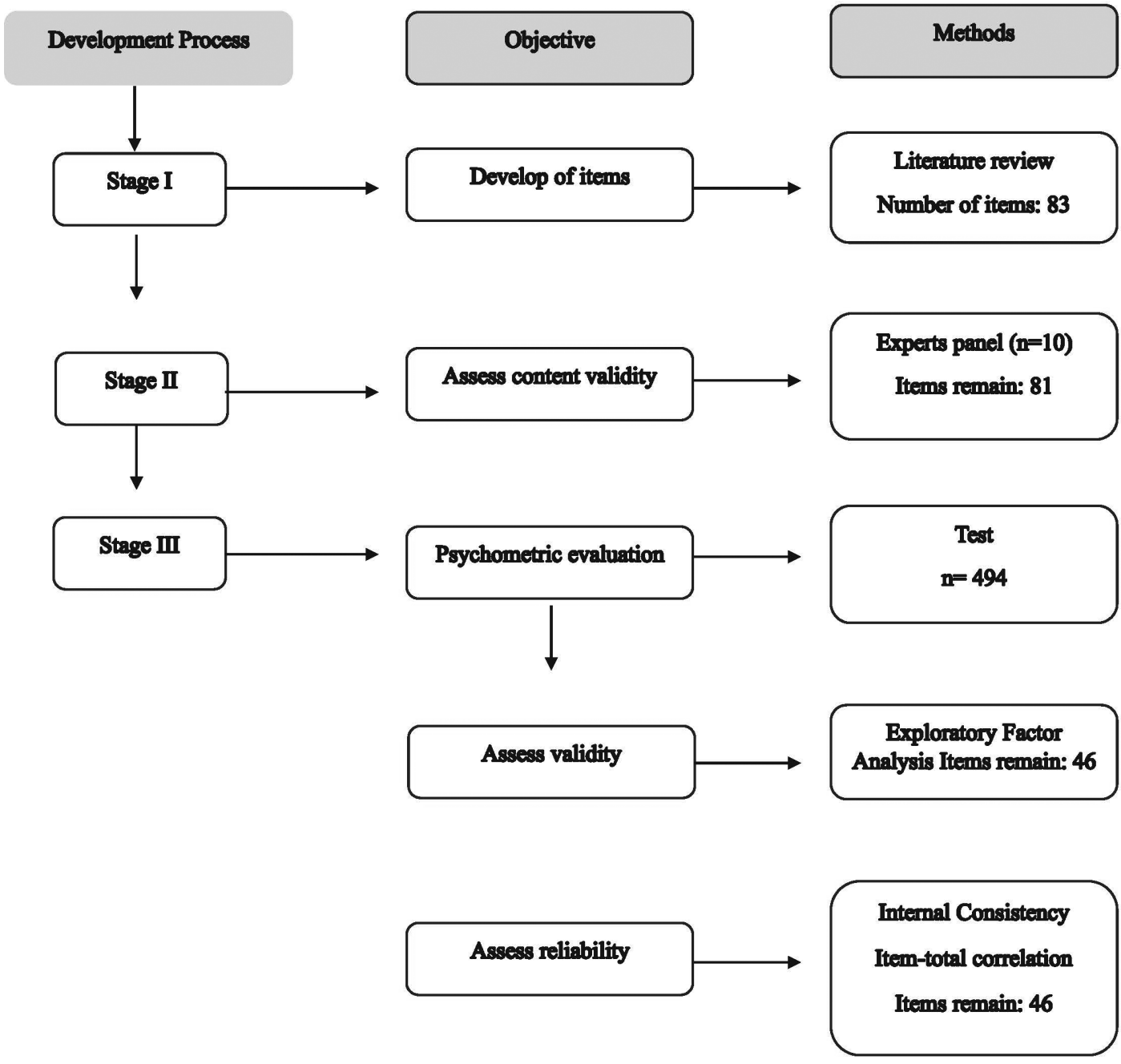

Figure 1.
Stage of Scale Development Process.

Ethical Considerations

Ethical approval was obtained from the Ethics Committee of the Institute of Health Sciences at Marmara University (approval date and number: February 21.02.2022—19). Written permission was also obtained from the Antalya District National Education Directorate. Before starting the research, information about the study was provided to the students and their parents, and their written consent was obtained.

Results

A total of 509 ninth and tenth-grade high school students participated in this study. After excluding 15 participants who had incomplete survey responses, the study was completed with 494 students.

Validity

In the content validity analysis, I-CVI scores ranged between 0.80 and 1, except for two items. The two items with an I-CVI

value below 0.80 were excluded from the scale at this stage. The S-CVI value was found to be 0.94.

The EFA was started with 81 items. The Kaiser–Meyer–Olkin value was found to be 0.92 (Table 1), indicating that the sample was adequate for factor analysis. The result of Bartlett's test was also statistically significant ($p < .001$), which demonstrated that the structure of the scale was multifactorial.

Initially, anti-image correlations were examined. Since the anti-image correlation for all items was above 0.70, no items were removed from the scale at this stage. The first factor analysis conducted with 81 items revealed a 16-factor structure with eigenvalues above 1, explaining 63.80% of the total variance. Items with a factor loading below 0.32 and items loading on multiple factors with a difference less than 0.10 were individually removed, and the factor analyses were repeated. As a result of these analyses, 35 items were excluded from the scale. The final version of the scale, consisting of 46 items, was found to be grouped into six sub-factors (Table 1). In the final factor analysis, the factor loadings ranged from 0.42 to 0.80. The total variance explained by the six factors of the remaining items was found to be 57.7%. The explained variance was found to be 15% for the perceived susceptibility subscale, 9.9% for perceived severity, 9.8% for perceived benefits, 7.6% for self-efficacy, 6.2% for motivation, and 9% for perceived barriers (Table 2).

Reliability

The scale's item-total correlations ranged between 0.26 and 0.79. Cronbach's coefficient alpha of subscales was found to be 0.92 for perceived susceptibility, 0.90 for perceived severity, 0.90 for perceived benefits, 0.81 for self-efficacy, 0.79 for motivation, and 0.69 for perceived barriers. To further examine the reliability of the scale, a split-half reliability analysis was conducted. The items were divided into two halves. The Cronbach's alpha coefficient for the first half was 0.92, and for the second half, it was 0.78. These results indicate a high level of internal consistency for both parts, further supporting the reliability of the scale. As a result of the reliability analysis, no items were removed from the scale.

Discussion

In this study, a scale based on the HBM was developed to evaluate adolescents' beliefs about sleep. This scale is the first of its kind to assess adolescent health beliefs regarding sleep. The scale consists of 46 items and 6 sub-factors. The scoring of items was determined as a 5-point Likert scale: Strongly agree (5), agree (4), undecided (3), disagree (2), and strongly disagree (1). The perceived barrier items were reverse-coded.

Table 1.
KMO and Bartlett's Test Results of the Scale

Kaiser–Meyer–Olkin	**0.92**
Bartlett's Test of Sphericity	
Chi-square	23501.14
Degree of freedom	3240
p	.000

Content validity is an important type of validity used to determine whether a measurement tool adequately covers all relevant content areas for its intended purpose. The high values of the CVI at both the item level and the scale level indicate that this scale sufficiently represents the concepts intended to be measured and is a strong indication of its validity.

The six sub-factors obtained through EFA were consistent with the structure of the Health Belief Model. Therefore, the sub-factors were named in accordance with the concepts of the Health Belief Model.

Factor 1: Perceived Susceptibility

Perceived susceptibility defines how individuals perceive a health threat and whether they consider themselves at risk. Among the sub-items of the susceptibility dimension, items Sus1 (I may physically struggle) and Sus2 (I may feel tired) have high factor loadings, making them significant indicators of susceptibility. These findings strongly indicate that sleep deprivation reflects physical fatigue effects. Tetik and Şen (2021) reported that sleep deprivation increases both physical and mental fatigue, negatively affecting individuals' daily lives. Another study highlighted that poor sleep quality is associated with anxiety and general mood disorders (Kim et al., 2022). These studies support that perceived susceptibility plays a role in individuals' responses to sleep deprivation. Item Sus3 (I may have difficulty making new plans and schedules) assesses the impact of sleep deprivation on planning. Owens and Weiss (2017) reported that screen-based media consumption reduces sleep duration, thereby impairing individuals' ability to plan their daily tasks. However, some items have lower factor loadings, such as Sus12 (My eating habits may change). This suggests that the impact of sleep deprivation on eating habits requires further investigation. Some studies have also indicated that sleep can influence food preferences (Lotfi et al., 2015; Baspinar & Yesilkaya, 2021).

Factor 2: Perceived Severity

Perceived severity is a dimension that measures how seriously individuals evaluate sleep deprivation and sleep disorders. Among the scale items, Sev1 (It is important for my health) and Sev2 (It is necessary for my growth) have high factor loadings, strongly reflecting the importance of perceived severity on sleep health. Current literature supports these findings. For example, Owens and Weiss (2017) emphasized that sufficient sleep is critical for physical and mental health. Similarly, Kim et al. (2022) highlighted the negative effects of sleep deprivation on the immune system and overall health. These studies support that the high factor loadings of Sev1 and Sev2 accurately measure the impact of perceived severity on sleep health. Items Sev3 (It is important for my rest) and Sev4 (It is important for my immunity) emphasize the effects of sleep deprivation on rest and immune function. Tetik and Şen (2021) reported that insufficient sleep weakens the immune system and makes individuals more susceptible to illnesses. However, item Sev7 (It is important for my happiness) was found to have a lower factor

Table 2.
Psychometric Properties of Sleep Health Belief Scale

Items and Subscales		Mean ± SD	Corrected Item-total Correlation	Factors Loadings					
				1	2	3	4	5	6
If I do not sleep for at least 7–8 uninterrupted hours every day:									
Perceived susceptibility α = 0.92	Sus1—I may physically struggle	3.7 ± 1.2	0.756	**0.796**	0.080	0.099	0.103	−0.072	0.003
	Sus2—I may feel tired	4.2 ± 0.9	0.728	**0.764**	0.201	0.028	0.004	−0.023	0.065
	Sus3—I may have difficulty making new plans and schedules	3.3 ± 1.3	0.708	**0.750**	0.027	0.183	0.101	0.004	−0.045
	Sus4—I may feel unmotivated	3.8 ± 1.1	0.709	**0.741**	0.143	0.108	−0.085	0.065	−0.013
	Sus5—I may have difficulty executing my plans	3.6 ± 1.2	0.718	**0.736**	0.171	0.175	0.052	−0.049	0.022
	Sus6—I may get tired quickly	3.8 ± 1.1	0.676	**0.711**	0.222	0.040	0.062	−0.039	−0.023
	Sus7—I may experience headaches	3.9 ± 1.1	0.639	**0.699**	0.101	0.013	0.040	−0.057	−0.043
	Sus8—I may not enjoy things that usually make me happy	3.3 ± 1.3	0.643	**0.692**	0.129	0.097	-0.016	0.089	-0.069
	Sus9—My social life may be negatively affected	3.1 ± 1.3	0.638	**0.687**	0.033	0.148	0.073	0.047	−0.021
	Sus10—My concentration may decrease while listening to lessons	4.0 ± 1.0	0.672	**0.686**	0.233	0.128	−0.086	0.009	−0.031
	Sus11—I may feel pain, burning, or stinging in my eyes	3.7 ± 1.2	0.631	**0.669**	0.134	0.074	0.033	−0.065	−0.066
	Sus12—My eating habits may change	3.2 ± 1.3	0.590	**0.656**	0.003	0.033	−0.006	0.052	−0.097
Sleeping for at least 7–8 uninterrupted hours every day:									
Perceived severity α = 0.90	Sev1—It is important for my health	4.2 ± 0.8	0.767	0.179	**0.796**	0.147	0.159	0.137	0.026
	Sev2—It is necessary for my growth	4.2 ± 0.9	0.739	0.155	**0.799**	0.161	0.093	0.145	−0.009
	Sev3—It is important for my rest	4.3 ± 0.8	0.766	0.229	**0.778**	0.220	0.072	0.001	0.098
	Sev4—It is important for my immunity	4.1 ± 0.9	0.728	0.192	**0.754**	0.131	0.127	0.221	−0.006
	Sev5—It is important for staying fit	4.2 ± 0.8	0.795	0.275	**0.759**	0.265	0.133	−0.018	0.096
	Sev6—It is important for starting a new day refreshed	4.1 ± 0.9	0.665	0.283	**0.591**	0.352	0.134	−0.019	−0.004
	Sev7—It is important for my happiness	3.8 ± 1.2	0.624	0.246	**0.552**	0.289	0.139	0.136	0.024

If I sleep for at least 7–8 uninterrupted hours every day;									
Perceived benefits α = 0.90	Ben1—I can plan my daily tasks more easily	3.4 ± 1.1	0.753	0.244	0.173	**0.737**	0.156	0.190	−0.095
	Ben2—I follow my daily schedule	3.4 ± 1.1	0.704	0.161	0.141	**0.729**	0.155	0.174	−0.073
	Ben3—I can concentrate better in class	3.8 ± 1.0	0.708	0.094	0.292	**0.727**	0.140	0.086	0.047
	Ben4—I contribute more to class	3.6 ± 1.1	0.715	0.190	0.236	**0.716**	0.177	0.106	0.031
	Ben5—I can cope more easily with negative situations	3.1 ± 1.2	0.694	0.075	0.190	**0.716**	0.152	0.152	−0.075
	Ben6—I become more creative	3.2 ± 1.1	0.713	0.175	0.190	**0.687**	0.203	0.149	−0.053
	Ben7—I become more willing to take on responsibilities.	3.0 ± 1.1	0.705	0.153	0.149	**0.653**	0.274	0.247	−0.072
Despite all the challenges, to ensure I sleep for at least 7–8 uninterrupted hours every day:									
Self-efficacy α = 0.81	Sef1—I go to bed without missing my sleep schedule	2.6 ± 1.1	0.699	0.016	0.186	0.176	**0.762**	0.129	−0.050
	Sef2—Even if I want to spend time with my friends, I make sure to go to bed when my sleep time comes	2.4 ± 1.2	0.650	0.065	0.111	0.203	**0.747**	0.127	0.009
	Sef3—I ensure that I go to bed by 11:00 pm	2.4 ± 1.3	0.624	0.018	0.092	0.240	**0.720**	0.048	−0.143
	Sef4—I stop using TV, computers, phones, etc., two hours before my sleep time	1.9 ± 1.1	0.513	0.062	−0.023	0.119	**0.579**	0.352	−0.177
	Sef5—I try not to disrupt my sleep routine	3.4 ± 1.1	0.512	0.026	0.334	0.154	**0.558**	0.189	0.038
	Sef6—I avoid caffeinated beverages	2.6 ± 1.4	0.477	0.016	0.069	0.141	**0.551**	0.181	−0.018
In order to get at least 7–8 hours of uninterrupted sleep each day:									

Motivation α = .79	Mot1—I exercise during the day	2.8 ± 1.2	0.475	−0.061	0.105	0.160	0.045	**0.669**	0.003
	Mot2—I eat healthy	3.2 ± 1.1	0.587	−0.119	0.103	0.241	0.203	**0.655**	0.033
	Mot3—I plan my day and follow that plan	2.8 ± 1.2	0.604	0.019	0.028	0.312	0.213	**0.647**	−0.113
	Mot4—I engage in beneficial activities to prevent poor sleep quality	2.9 ± 1.3	0.606	−0.021	0.193	0.129	0.406	**0.584**	−0.054
	Mot5—I inform the people around me about the importance of sleep	2.2 ± 1.2	0.501	−0.013	0.050	0.080	0.359	**0.530**	−0.216
	Mot6—I want to get enough sleep to protect my health	3.6 ± 1.2	0.530	0.135	0.308	0.192	0.295	**0.502**	0.093
Factors that prevent me from getting at least 7–8 hours of uninterrupted sleep each day:									
Perceived barriers α = 0.69	Bar1—Spending excessive time with my friends	3.1 ± 1.2	0.432	−0.084	0.044	−0.009	0.100	−0.050	**0.802**
	Bar2—Not having my own room	4.3 ± 1.0	0.470	−0.079	0.075	−0.053	−0.105	−0.020	**0.760**
	Bar3—The noise level around the home being too high	4.0 ± 1.1	0.397	−0.098	−0.073	−0.096	−0.016	0.162	**0.745**
	Bar4—Excessive use of the internet and social media	2.7 ± 1.2	0.263	−0.189	−0.108	0.008	0.059	0.122	0.**734**
	Bar5—My bed not being comfortable	4.0 ± 1.1	0.439	-0.090	−0.018	−0.003	−0.017	−0.184	**0.661**
	Bar6—Using a nightlight	4.1 ± 1.0	0.365	0.018	0.114	0.047	−0.093	−0.192	**0.569**
	Bar7—My family going to bed very late Bar8-Sleeping/dozing during the day	3.9 ± 1.0 3.0 ± 1.3	0.4240.300	0.023 -0.265	0.070 -0.028	−0.082 -0.166	−0.034 0.037	0.076 0.025	**0.562** 0.422
Eigenvalue				6.9	4.5	4.5	3.5	2.8	2.4
Percentage of the explained variance				15	9.9	9.8	7.6	6.2	9
Cumulative percentage				15	24.9	34.8	42.4	48.6	57.7

loading. Lotfi et al. (2015) indicated that sleep quality has a significant effect on life satisfaction.

Factor 3: Perceived Benefits

Perceived benefits refer to the extent to which individuals recognize the potential advantages of sleep health and value its importance. Among the scale items, Ben1 (I can plan my daily tasks more easily) and Ben2 (I follow my daily schedule) have high factor loadings, highlighting the positive effects of sleep regulation on individuals' daily lives. These items play a crucial role in understanding the functional benefits of improving sleep quality. Recent studies support the findings related to Ben1 and Ben2. Sufficient sleep has been shown to enhance mental and physical performance, making daily activities easier (Tetik & Şen, 2021; Owens & Weiss, 2017). Items Ben3 (I can concentrate better in class) and Ben4 (I contribute more to class) reflect the positive impact of sleep regulation on academic performance. Illingworth (2020) reported that regular and high-quality sleep positively influences academic success. Similarly, Kim et al. (2022) provided data supporting the effects of sleep quality on academic concentration and learning. On the other hand, items Ben5 (I can cope more easily with negative situations) and Ben6 (I become more creative) showed lower factor loadings. Lotfi et al. (2015) emphasized the effects of sleep quality on life satisfaction and stress management but noted that individual perceptions of these effects may vary.

Factor 4: Self-Efficacy
Self-efficacy refers to individuals' perceived ability to maintain and improve their sleep patterns. This construct reflects the degree of confidence individuals have in regulating their sleep habits effectively. Among the scale items, Sef1 (I go to bed without missing my sleep schedule) and Sef2 (Even if I want to spend time with my friends, I make sure to go to bed when my sleep time comes) exhibit high factor loadings, indicating that self-efficacy in maintaining a consistent sleep routine significantly influences individuals' ability to establish and sustain healthy sleep behaviors. Empirical evidence supports the validity of Sef1 and Sef2. Tetik and Şen (2021) demonstrated that individuals' belief in their capacity to follow a structured sleep schedule plays a crucial role in enhancing sleep hygiene. Similarly, Owens and Weiss (2017) emphasized that a strong sense of self-efficacy regarding sleep health is positively associated with adherence to sleep-promoting behaviors. Additionally, Sef3 (I ensure that I go to bed by 11:00 pm) and Sef4 (I stop using TV, computers, phones, etc., two hours before my sleep time) highlight the role of self-efficacy in sustaining a regulated sleep schedule. Kim et al. (2022) found that individuals with higher self-efficacy regarding sleep routines demonstrate greater consistency in maintaining sleep hygiene. Furthermore, Illingworth (2020) reported that a strong belief in one's ability to regulate sleep patterns contributes significantly to improved sleep quality.

Factor 5: Motivation
Motivation refers to individuals' intrinsic and extrinsic incentives in developing and maintaining sleep habits. Items in the scale, such as Mot1 (I exercise during the day) and Mot2 (I eat healthily), have high factor loadings, indicating that individuals' motivation toward healthy living habits affects their sleep habits. Tetik and Şen (2021) and Owens and Weiss (2017) also found that physical activity and healthy eating have positive effects on sleep quality. Items like Mot3 (I plan my day and follow that plan) and Mot4 (I engage in beneficial activities to prevent poor sleep quality) also have significant factor loadings. These items express individuals' motivation to set goals for sleep health and achieve those goals. Knowlden and Sharma (2014) stated that planning and setting goals for sleep routines have positive effects on sleep quality. Kim et al. (2022) emphasized that individuals' motivation to improve sleep health is a determining factor in improving sleep patterns.

Factor 6: Perceived Barriers
Perceived barriers refers to individuals' perceptions of the factors that hinder their ability to improve their sleep habits. Items in the scale, such as Bar2 (Not having my own room), Bar3 (The noise level around the home being too high), and Bar5 (My bed not being comfortable), indicate that these factors significantly impact sleep quality, making it difficult for individuals to maintain sleep habits. Specifically, items Bar2 and Bar3 align with findings emphasizing the effects of the physical environment on sleep quality. Recent literature frequently highlights the significant effects of environmental factors on sleep quality. Studies Kurugodiyavar (2018) have shown that elements like noise and comfort in the sleep environment have marked effects on sleep quality. The scale items support these findings, demonstrating that the physical conditions of the sleep environment directly impact sleep quality.

In the reliability analysis, the item-total correlations of the scale items ranged from 0.26 to 0.79. This variation indicates that some items show a stronger relationship with the overall structure of the scale, while others have a lower correlation. However, the item-total correlations are generally within an acceptable range (most of them being 0.32 and above), which is considered a positive aspect regarding the overall reliability of the scale.

The Cronbach's alpha coefficients of the subscales are also significant findings in terms of reliability. The alpha values for the subscales of perceived susceptibility, perceived severity, and perceived benefits are 0.92, 0.90, and 0.90, respectively, indicating that these subscales have high internal consistency and provide reliable measurements. The alpha values for the subscales of self-efficacy and motivation are 0.81 and 0.79, respectively, generally considered acceptable reliability levels, suggesting that these subscales also offer reliable measurements. However, an alpha value of 0.69 for the perceived barriers subscale indicates that this subscale's internal consistency is somewhat lower but still acceptable for most scientific research. In conclusion, the fact that no items were removed from the scale in the reliability analysis shows that the scale is generally consistent and reliable. The split-half reliability analysis further confirmed the internal consistency of the scale. The high Cronbach's alpha values obtained for both halves (0.92 and 0.78) indicate that the items are consistently measuring the same underlying construct, supporting the overall reliability of the scale.

Study Limitations
As this is a new scale development study, the present article provides only preliminary results. Limitations include the absence of confirmatory factor analysis, test-retest reliability assessment, and the lack of a more diverse sample.

Conclusion and Recommendations

It was developed a scale based on the HBM to evaluate adolescents' beliefs about sleep in this study. The scale, comprising 46 items and 6 sub-factors, demonstrated strong validity and reliability. The high CVI values at both the item and scale levels indicate that the scale adequately represents the intended concepts, providing a robust measure of adolescents' health beliefs regarding sleep. The EFA revealed six sub-factors consistent with the Health Belief Model: perceived susceptibility, perceived severity, perceived benefits, self-efficacy, motivation, and perceived barriers. These sub-factors highlight the multidimensional nature of health beliefs related to sleep and underscore the importance of addressing various aspects to improve sleep health among adolescents.

The reliability analysis of the scale demonstrates that it is a consistent and reliable measurement tool. The item-total correlations indicate that most items exhibit a strong relationship with the overall structure of the scale, reinforcing its internal validity. Additionally, the high Cronbach's alpha values for key subscales, particularly perceived susceptibility, severity, and benefits, confirm their strong internal consistency. While the self-efficacy and motivation subscales also show acceptable reliability, the perceived barriers subscale has a slightly lower but still acceptable internal consistency.

This scale can be effectively used in practical settings to assess the targeted constructs with confidence. It can be used as an assessment tool in studies focused on sleep. In addition, its cross-cultural adaptation for use with adolescents in other countries is recommended.

Data Availability Statement: The data that support the findings of this study are available on request from the corresponding author.

Ethics Committee Approval: Ethical committee approval was received from the Ethics Committee of University of Marmara (Approval no: 19; Date: 21.02.2025).

Informed Consent: Written informed consent was obtained from adelescents and their parents who participated in this study.

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