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RESEARCH PAPER

Perseverative Thinking, Sleep Quality, and Academic Performance in Adolescents

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ABSTRACT

The research study examines perseverative thinking, sleep quality and academic performance among adolescents. The study was delimited to a group of intermediate-level students, aged 15-19. Cognitive and behavioural factors play a key role in educational outcomes during the teenage stage. According to research, repetitive negative thinking and poor sleep patterns affect emotional regulation, concentration and academic success. The data were collected from 150 college students using a standardized instrument, following a quantitative, correlational research design and random sampling. The Perseverative Thinking Questionnaire (PTQ), Sleep Quality Scale (SQS), and Academic Performance Scale (APS) are applied. For Statistical analysis, the Statistical Package for the Social Sciences (SPSS), including regression, correlations, independent-samples t-tests, and mediation analyses. As a result, perseverative thinking negatively predicts academic performance, while sleep quality positively predicts it. While sleep quality partially mediates, significant gender-based differences are also revealed. Thus, educational institutions should support cognitive-behavioural interventions and sleep hygiene to reduce negative thinking patterns and enhance adolescent academic achievement.

KEYWORDS Cognitive Behavior, Perseverative Thinking, Sleep Quality, Academic Performance, Adolescents

Introduction

Young people's behavior undergoes rapid biological and other changes during the teenage years, including physical, emotional and cognitive development, which also occurs swiftly. This is considered a critical phase in a human being's life cycle. External factors, such as socio-economic status, overall lifestyle and well-being, shape the academic and social lives of adolescents. However, in the cognitive pattern, perseverative thinking plays a crucial role, characterized by repetitive, rigid thoughts. Finally, this pattern of thinking causes intellectual challenges such as anxiety, overthinking, depression, and lack of confidence. This type of thinking pattern might be more detrimental, especially during the teenage phase, and can severely affect youth's academic performance. In the context of a defence force, coping mechanisms or countermeasure strategies are not fully developed and are still in an evolving phase (Bacaro, Carpentier, & Crocetti, 2023). Another factor is sleep quality, a fundamental need of the body, which is frequently compromised, particularly during biological changes, increased demands of educational activities, and lifestyle choices. The most vital role of sleep is often neglected, yet it is essential for maintaining physical and mental well-being (Smaldone, Honig, & Byrne, 2007). A complex web of relations exists among these three variables, such as sleep quality, perseverative thinking and academic performance (Gradisar et al., 2020). Emotional regulation and cognitive functions are always severely affected by poor sleep, leading to a harmful negative thought pattern and undermining self-efficacy. Furthermore, it affects overall life performance and, particularly, decreases academic motivation, such as capability, concentration, and the ability to solve problems and cope with challenges, and, by and large, leads to mental health issues among

teenagers (Bacaro et al., 2023). As a result, beyond academic performance, an individual's socio-economic and spiritual relationships are influenced, and their overall well-being (Sumich, 2025).

In this research study, the three variables are investigated in the context of Pakistan to determine their combined impact and the relationship between them. Additionally, in light of past literature reviews and various tests, the data are analyzed, and the results are presented with unique insights and findings. This research study clearly highlights the significance of the topic and its practical impact among young people, who are in a critical developmental phase of the lifecycle. It is imperative to diagnose the deep causes and symptoms of these issues and develop coping mechanisms and countermeasures; thus, they can be addressed effectively by incorporating the recommendations and insights from the research study. Due to the increasing burden of educational activities and societal pressure, the majority of young people are facing considerable academic pressure, which leads to their mental health issues and disturbance of daily life routines. One of the severe and notable factors is the perseverative thinking pattern among adolescents; this concept is a kind of repetitive, uncollroable worry about things. However, it has often been associated with sleep quality and is a key factor in maintaining a person's emotional and cognitive health. As per previous studies and observations, adolescents often experience persistent thinking due to poor sleep quality, which directly leads to poor academic performance. The study examines the relations among variables such as perseverative thinking and sleep quality, and how these variables impact the educational success and achievement of young people and their overall well-being. It also shows how these factors affect adolescents' cognitive abilities, such as information retention, concentration, performance and outcomes.

Literature Review

The multiple sources have been thoroughly searched, as previous scholars have explored these variables and their insights and analyses, demonstrating an increased relationship among them and establishing a price-accurate literature for the research study. Additionally, each concept and construct, such as perseverative thinking, sleep and academic performance patterns, was defined effectively, enabling a comprehensive understanding of each term and its application.

Perseverative Thinking

As per the scholarly definition, perseverative thinking is an intrusive mental engagement with distressing thoughts linked to concern and memories, as a cognitive process that persists throughout. Whenever this thinking pattern is disturbed, it leads to mental preoccupation with negative stimuli, including fear of failure, anxiety about the future, or obsessiveness with some negative thoughts (Ehring and Watkins, 2008). This thinking pattern also leads to emotional suffering and weakened cognitive abilities, which always operate automatically, resistively and involuntarily in each individual's mind (Watkins, 2008). It deos not only affects the psychological well-being but influencing maltificated such as social relationships, and particularly academic performance, which by and large lead to the mental health issues of an individual. Perseverative thinking can severely hinder the academic performance of young people, including problem-solving ability, concentration and information retention, ultimately leading to greater failure (Owens et al., 2012). However, it can lead to several socio-economic and spiritual issues that affect all domains of the adolescent's lifecycle and undermine overall well-being (Andersson et al., 2013).

Sleep Quality

Sleep quality can be measured from various angles, including qualitative and quantitative aspects such as continuity, duration and depth, which vary from person to

person (Buysse et al., 1989). Thus, cognitive performance, physical health, and mental well-being are mostly dependent on sleep quality. Therefore, good sleep quality is defined as minimal awakenings, an efficient sleep cycle, and adequate healing sleep stages, resulting in enhanced daytime functioning of the brain and mind (Krystal, 2012). On the other hand, poor sleep quality has been characterized by insomnia, distraction and disturbance, inadequate sleep duration, and fragmented sleep, which ultimately lead to disturbances in mood regulation, memory turbulences, and impairments in attention (Walker, 2017). However, due to ongoing critical neurodevelopment and increasing demands from academic and social activities, adolescents must get enough sleep (Owens et al., 2014). As per the research studies, poor sleep quality is associated with an increased risk of mental health disorders, which directly leads to academic difficulties and performance, as well as hindering daytime functioning (Wheaton et al., 2016). Thus, it is imperative for maintaining overall health, wellness and optimal functioning of life to prioritise good sleep quality. In this context, it is far more important for educators and teenagers that their educational achievement and success are closely linked to sleep quality, including mental and physical health.

Academic Performance

Academic achievement is broadly measured through various factors, such as the education system, grades, standardized test scores and assessments by educators and teachers (Gentry et al., 2019). As a result, knowledge, skills, and competencies can be demonstrated within students' specific academic context, as reflected in academic achievement measures. Therefore, various elements contribute to this achievement and are influenced by a wide range of factors, such as motivation, access to resources, learning strategies, support networks and cognitive abilities. (Sirin, 2005). Thus, academic achievement and success help students explore opportunities and utilize them for further career success, serving as a vital indicator of students' learning outcomes, preparedness for the future and cognitive growth and leading to professional endeavours. As it varies by country and includes primary, middle, intermediate and higher education, it has a profound impact on future opportunities and career (Hanushek & Woessmann, 2015). Therefore, academic achievement reflects overall performance at all levels of education. Thus, as previous research indicates, perseverative thinking and sleep quality are strongly associated with students' educational routine and success.

The above literature has been thoroughly reviewed, including the conceptual definitions of each term and variable, and discussing their intricate relationships and impact on young people. Therefore, a meaningful, insightful and precise result has been extracted and integrated into the research study's findings. By effectively addressing perseverative thinking and breaking the cycle, sleep quality can be improved, leading to better cognitive functioning. Thus, it ultimately improves academic outcomes and every aspect of life, including daily activities and performance. The literature studies were conducted in the Western context and analyzed the variables in depth. However, its significance remains in the context of Pakistan among young people whose performance is poor, due to perseverative thinking and poor sleep. This research study was intended to fill a gap in the existing literature in the local context and to build on previous literature. This research holds significant implications for various academic domains, such as psychology, education and sociology. Thus, it is a need of the time to address these concerns effectively and incorporate them to fill this gap and enhance students' overall academic performance.

Hypothetical Model

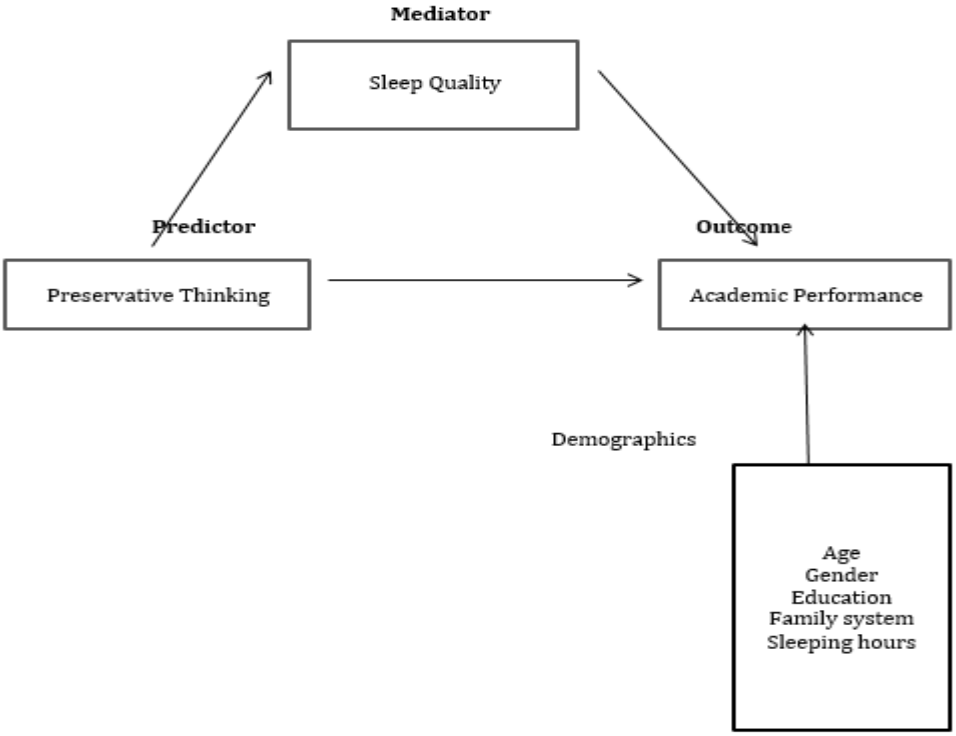

Figure 1 Hypothetical Model

Material and Methods

This research study has been conducted according to the scientific method and procedure, with the application of various techniques and methods. It has been organized in a rational order, including research design, sampling strategy, assessment measures, operational definitions of concepts and terms, and the ethical framework for data collection, including the studies' limitations.

Research Design

A correlational method has been used to study the relationships among variables, such as Perseverative Thinking and sleep quality, and Academic performance in adolescence.

Sampling Strategy

A random sampling method was applied to a sample of 150 students from colleges in the adolescent age group. The age range was 15-19, and individuals with severe sleep disorders or psychiatric conditions were excluded.

Table 1
Demographics Showing Sample Characteristics

Characteristics	M(SD)	F (%)
Age.	2.37(.88)	
15-16 years.		14(9.3)
16-17 years		90(60)
17-18 years		26(17.3)
18-19 years		17(11.3)
Gender.	1.62(.49)	
Male		93(62)
Female		57(38)

Education.	1.65(.48)	
Intermediate		52(34.7)
Undergraduate		98(65.3)
Family Structure.	1.44(.49)	
Nuclear		84(56)
Joint		66(44)
Sleeping Hours.	1.79(.69)	
12-8 hours		54(36)
7-4 hours		73(48.7)
Less than 4 hours		23(15.3)

Note. M=Mean; SD=Standard Deviation; f=frequency; %=percentage

Assessment Measures

The assessment measures were used to collect data from members.

Demographic Information Sheet

A demographic sheet was built to acquire demographic information, such as Age, Gender, Family Structure, education, sleeping hours, and study hours."

Perseverative Thinking Questionnaire.

Perseverative Thinking Questionnaire, consisting of 15 items. The item pool comprised three items for each of the assumed process characteristics of repetitive negative thinking: (1a) repetitive (e.g., "The same thoughts keep going through my mind again and again"), (1b) intrusive (e.g., "Thoughts come to my mind without me wanting them to"), (1c) difficult to disengage from (e.g., "I can't stop dwelling on them"), (2) unproductive (e.g., "I keep asking myself questions without finding an answer"), (3) capturing mental capacity (e.g. "My thought prevent me from focusing on other things") Participants were asked to rate each item on a scale ranging from '0' (never) to '4' (almost always) (Ehring et al.,2011).

Sleep Quality scale.

The Sleep Quality Scale consists of six factors and 28 items, which account for 62.6% of the total variance. The difference in SQS score between insomniacs and normal subjects established the construct validity ($t = -13.8$, $P = 0.000$). Concurrent validity was recognized by the significant correlation between SQS and the Pittsburgh Sleep Quality Index ($r = 0.72$, $P < 0.000$). The Cronbach's alpha coefficient was 0.92 for internal consistency, and the test-retest reliability coefficient was 0.81 at a 2-week interval. Therefore, this scale for reliability and validity was considered an accurate instrument to assess sleep quality ian a authentic way (C. Shin et al., 2006).

Academic performance questionnaire

The Academic Performance Questionnaire consists of 8 items and uses a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). Its reliability and validity were tested, and Cronbach's alpha was 0.89 **(**C Birchmeier et al., 2004).

Statistical Analysis

In the initial stage of analysis, the data's reliability was tested using Cronbach's alphas for the scales. In the second phase, the relationships among the variables were assessed using Pearson's correlation coefficient, including the demographics and the other three variables. Additionally, a linear regression analysis was conducted to predict the impact of the first variable, Preservative thinking and sleep quality, on academic achievement and success among young people. Finally, to examine the differences in academic success scores between males and females, a paired t-test was applied.

Procedure

For data collection, permission was obtained from the scale's authors and the relevant authorities. The target candidates were briefed on the study's purpose and nature before the questionnaire and provided their consent forms. Furthermore, regarding the confidentiality of their responses, they were politely assured, thanked and appreciated.

Ethical Consideration

Ethical deliberations were consistently considered and maintained throughout the research process, from inception to completion, as follows:

- Permission was sought from each author of the questionnaire to administer it in this study.
- An authority letter was requested for permission from the Institute of Applied Psychology.
- Participants' consent was obtained by having them sign their consent forms after being debriefed about the study's purpose.
- Participants have been given the option to participate in the questionnaire at any time and to refuse to provide their data against their will.
- The privacy and confidentiality of data obtained from participants were maintained throughout data collection and beyond.

Results and Discussion

This study presents results exploring the relationships among these three variables, such as perseverative thinking, sleep quality, and academic achievement and success in teenagers. The data analysis process began with reliability and validity, followed by correlation and linear tests.

Reliability Analysis

Table 2
Range

Variables	N	M	SD	potential	Actual	α
Preservative Thinking	15	31.58	10.23	1-5	15-75	.820
Sleep Quality	28	39.82	10.87	1-4	28-112	.76
Academic performance	08	26.31	5.57	1-5	8-40	.70

Note. M=Mean; SD=Standard Deviation; value; α = Cronbach alpha

The table consists of means, standard deviations, the number of items and the following reliabilities. The perseverative thinking and sleep quality scales had high internal reliability, while the academic performance scale had moderate to high internal reliability.

Relationship between Study Variables and Demographics.

The correlations among demographic variables were computed using Pearson's Product-Moment Correlation.

Table 3
Perceived Perseverative Thinking, Sleep quality, and Academic performance in adolescents (N=150)

Variables	1	2	3	4	5	6	7	8
Gender	-	-.237	.498**	-.176*	-.164*	.066	.024	.225**

Age	-	-	-.415**	.226**	.028	-.031	.226**	-.269**
Education	-	-	-	_.077	-.173*	.024	-.139	.318**
Sleeping Hours	-	-	-	-	.052	.116	.182*	-.170*
Family system	-	-	-	-	-	-.075	-137	-.197
Preservative Thinking	-	-	-	-	-	-	.265**	-.071
Sleep Quality	-	-	-	-	-	-	-	.099
Academic performance	-	-	-	-	-	-	-	-

Note. *p< .05, **p< .01, ***p<.0011

The findings of this analysis report demonstrated that Perseverative Thinking had a significant negative relationship with sleep quality and Academic performance in teenagers. Adolescents with higher levels of Perseverative Thinking may experience poorer sleep quality and adverse effects on their educational outcomes. Moreover, a significant positive relationship occurs between sleep quality and Academic performance in young people. This suggests that adolescents with upright sleep quality are more likely to achieve better academic performance. It was also hypothesised that Perseverative Thinking, sleep quality, and demographics would predict academic performance in adolescents. To assess this hypothesis, linear regression analysis was performed. Results are reported in Table 3

Linear Regression

Linear regression analysis aimed to assess and evaluate the predictive value of perseverative thinking and sleep quality for academic achievement and success among young people.

Table 4
Linear Regression Analysis of Demographics, Perseverative Thinking, and Sleep Quality on Educational Outcomes of Students.

Predictors	B	SE	Beta	95%CL		P
				LL	UL	
Gender	.176	1.003	.015	-1.80	2.15	.861
Age	-1.29**	.539	-.204	-2.35	-.228	.018
Education	2.61**	1.07	.224	.480	4.747	.017
Sleeping hours	-1.01	.633	-.125	-2.26	.240	.112
Family system	-2.15**	.858	-.192	-3.84	-.455	.013
Perseverative Thinking	-.084*	.042	-.153	-.167	.000	.051
Sleep Quality	.136**	.042	.265	.054	.281	.001
F	4.80					
R^2	.168					

Note. *p< .05, **p< .01, ***p<.0011 B= unstandardized B, SE=Standardized Error

The purpose of this analysis is to determine whether Perseverative thinking, sleep quality, and demographics predict academic performance in teenagers using linear regression. According to the findings, perseverative thinking is a significant negative predictor of academic performance in young people, whereas sleep quality is a significant positive predictor. Findings also showed that gender, education, family system, and sleep hours are negative predictors of academic performance in adolescents, whereas age is a positive predictor.

Table 5
Hierarchical Regression Analysis for Mediation

Variables	M1(β)	M2(β)	M3(β)
Control Variables			

Gender	.545	.630	.176
Age	-.931*	-.963*	-1.29**
Education	2.34**	2.29**	2.61**
Sleeping Hours	-.857	-.757	-1.01
Family system	-1.62*	-1.699*	-2.151**
R^2	.161		
Independent Variable			
Perseverative Thinking		-.046	-.084*
R^2		.168	
XR^2		0.20	
Mediating variable			
Sleep quality			.136***
R^2			.226
XR^2			0.29

Note*p<.05, **p<.01, ***p<.001, β=Standardized Coefficient

In this portion of the analysis, the sleep quality variable serves as a mediator in the relationship between perseverative thinking and academic performance among teenagers. Here is the three-step hierarchical regression analysis to be followed. In the initial stage, all demographic variables are controlled to better account for their effects; in the second stage, the independent variables are added; and in the third step, a mediating variable is added. Therefore, according to the model, sleep quality mediates the relationship between the other two variables in this study.

Table 6
Independent Sample t-Test Shows Gender Difference in Academic Performance among Adolescents. (N=150)

Variable	Male (n=93)		Female (n=57)			p	95% CI		Cohen'sd
							LL	UL	
	M	SD	M	SD	t(148)				
Academic performance	27.29	5.80	24.71	4.81	148	00.6	-4.3	-.75	0.48

*Note: *p<.05,**p<.01, ***p<.001; CI = Confidence Interval; M = Mean; SD = Standard Deviation; LL = Lower Limit; UL = Upper Limit.*

To determine gender differences, a t-test for independent samples was applied to academic achievement and success. As per the equal variances ($p < .05$), and finding revealed a significant gender difference.

Discussion

The analysis reports show a significant negative correlation between perseverative thinking and academic performance among teenagers. This suggests that higher levels of perseverative thinking are associated with lower academic performance, consistent with the research findings of Ahmed and Rashid (2020), who reported that perseverative thinking harms both academic performance and mental health in Pakistani adolescents. Furthermore, Guastella and Moulds (2007) found that contemplation has an indirect effect on academic stress, which, in turn, can lead to decreased academic performance. This research study also demonstrated that young people experiencing higher levels of perseverative thinking due to poor sleep quality, as indicated by significant negative relations between these two variables. Thus, this finding aligns with the research findings of Schmidt, Harvey, and Van der Linden (2011).

Additionally, the study by Curcio, Ferrara, and De Gennaro (2006) also revealed that sleep quality effectively mediates the relationship between stress and academic performance among adolescents. Dewald et al. (2010) also supported this claim in their

research study, which found that sleep quality significantly affects academic performance, while better sleep quality enhances academic success level. The predictive role of demographic factors has also been examined in this analysis of perseverative thinking and other variables, in which some factors, such as gender and age, significantly predict them. The findings of this research study also aligned with those of Sivertsen et al. (2015), who effectively highlighted the influence of sleep quality and the cognitive-emotional relation on academic performance, as well as the role of demographic factors. The partial mediating role of sleep quality emerged between the first two variables, which supports the hypothesis. Therefore, in this context, perseverative thinking indirectly affects academic performance by influencing sleep quality, as this finding is supported by Siddiqui and Mahmood (2019), who explored and discussed the relationship among these variables and determined their impact.

Conclusion

The study has investigated and analyzed the relationship among three variables: sleep quality as a mediating variable, perseverative thinking as an independent variable, and academic performance as a dependent variable. The targeted population was young people, particularly those aged 15-19 and in under-school training. The correlation between perseverative thinking and academic performance was negative, indicating a strong association with lower academic performance. However, the correlations do not meet the criteria for statistical significance. On the other hand, a significant positive relationship exists between the sleep quality variable and the educational outcome variable. At the same time, indicating that adequate sleep patterns and sufficient hours of sleep are associated with better academic achievement and success. Thus, the perseverative thinking variable may not be a significant predictor of educational outcomes, whereas sufficient and restorative sleep is an essential factor that can impact academic achievement. However, this finding paves the way for future researchers to diversify and generalize their findings more broadly and to integrate other important factors in these domains of the study.

Recommendations

This research analysis revealed significant insights and results, particularly for mental health professionals, policymakers, educators, and parents, who can effectively incorporate them into their work to address these issues. At the academic level, through various techniques and strategies, improvements can be made for students and society, such as conducting awareness programs. This mainly focuses on cognitive-behavioural strategies to cope with negative thought patterns. Improving sleep hygiene and quality shows benefits and potential for healthier sleep among youngsters. Furthermore, comprehensive awareness and training programs should be conducted for parents and caregivers regarding the importance of creating a conducive sleep environment that supports healthy sleep habits. However, this study has several limitations, including data accuracy, bias and compromise due to reliance on self-reported measures to assess perseverative thinking, sleep quality and academic performance. The causal inferences were also limited by the study's correlational design and the ability to draw accurate results. Another limitation was the cultural context, which can hinder the generalizability process to a larger population. To achieve a more accurate assessment of sleep quality, future researchers can use polysomnography or actigraphy as the primary objective of the study to produce better results. Moreover, other factors can also be integrated into future research, such as depression and anxiety, and their relations with these variables. Therefore, in this context, generalizing and expanding the research's results to other cultures is preferable to share its benefits. In contrast, our research was confined to the emotional and cognitive importance for educational performance. Thus, this finding is a better support source for adolescent mental well-being and academic success while coping with psychological and social challenges during the critical phase of mental and physical development.

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