Mediating role of academic competence in the relationship between perceived teaching style and academic resilience among adolescents

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Abstract

Background Academic resilience is crucial for adolescents as it enables them to overcome challenges and achieve educational success, yet the mechanisms underlying its development remain inadequately understood. This study investigated the mediating role of academic competence in the association between perceived teaching style and academic resilience among adolescents.

Methods This descriptive correlational study was conducted between June 2022 and December 2022. The statistical population for this study encompassed all high school students in Tehran. To ensure the representativeness of the sample, a stratified random sampling technique was employed, involving a total of 400 high school students. Data were collected using online questionnaires, including the Academic Resilience Inventory (ARI), Teacher as Social Context (TASC), and Academic Competence Evaluation Scale (ACES). Descriptive statistics (e.g., mean, standard deviation, correlation matrix) and inferential statistics (e.g., path analysis) were used to analyze the data through SPSS-23 and LISREL version 8.7.2.

Results The findings demonstrate significant relationships between teaching styles, academic competence, and academic resilience. Specifically, path analysis reveals that teaching styles, particularly those emphasizing support and involvement, have direct and meaningful effects on academic competence, subsequently influencing academic resilience. The proposed model exhibits a good fit, as evidenced by various fit indices ($p < .05$).

Conclusion This study underscores the pivotal role of supportive and engaging teaching styles in fostering academic resilience among adolescents. By significantly enhancing students' academic competence, these teaching approaches contribute to their overall well-being. These findings offer valuable insights for educators and policymakers to develop strategies that cultivate both academic skills and emotional strength, ultimately leading to improved educational outcomes.

Keywords Academic competence, Teaching style, Resilience, Academic performance, Psychological well-being

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Introduction

Adolescence is a critical developmental period characterized by significant biological, cognitive, and social changes [1]. This phase presents numerous challenges and risk factors, including pubertal changes, educational transitions [2], personal characteristics, living conditions [3], family dynamics, and social resources [4]. These rapid transformations can lead to stress, conflict, and confusion, making adolescence a distinct risk factor for various psychological and social issues [5]. However, resilient students demonstrate the capacity to navigate and overcome these challenges, including poverty, violence, and family dysfunction [6]. Given the numerous stressors inherent to adolescence, developing resilience is crucial for fostering positive outcomes and mitigating the potential negative impacts of these challenges on academic performance.

Resilience is a multifaceted concept encompassing interactions between individuals, their personality traits, experiences, family dynamics, and social resources [7, 8]. Resilience, often conceptualized as a collection of personality traits, involves complex interactions between individuals, their experiences, family dynamics, and social resources [9]. These interactions contribute to positive adaptation in the face of adversity. It refers to specific personality traits that facilitate positive adaptation. Resilience represents the capacity to cope adaptively with challenging circumstances, playing a significant role in the educational process. Students exhibiting higher levels of resilience have demonstrated more positive outcomes in their psychological activities [10]. However, research suggests that students displaying resilience in specific domains may also exhibit vulnerability in other areas. In the domain of educational psychology, scholars and researchers contend that a substantial number of students encounter formidable social and educational challenges throughout their academic journey [11]. These challenges not only manifest within the confines of the classroom but also extend into their homes and communities [12]. Consequently, such difficulties possess the potential to engender a decline in academic performance, presenting future challenges in their lives. It is imperative to recognize the multifaceted nature of these situations, wherein a plethora of factors interplay and impact on students' academic achievements, ultimately resulting in academic underachievement [13]. Notably, among these factors, the concept of academic resilience assumes particular prominence.

Academic resilience is the ability to effectively manage various educational challenges, including exams, assignments, and time management [14]. It enables students to adapt to academic demands, maintain a positive outlook, and persevere through difficulties [15]. Resilient students demonstrate higher class participation, motivation, and academic performance [16], while exhibiting strong self-assessment skills and confidence in their cognitive abilities. A key characteristic of such students is their strong ability for self-assessment, allowing them to gauge their academic progress accurately. They assert control over their own learning process and possess unwavering confidence in their cognitive abilities [17]. The multifaceted nature of academic resilience, encompassing coping mechanisms, perseverance, and a positive mindset, facilitates successful navigation of academic challenges [18]. Nurturing academic resilience enhances educational outcomes and prepares students for future challenges in both academic and professional spheres [19]. Notably, students' perceptions of their teachers' engaging and motivational teaching methods significantly contribute to the development of academic resilience [20], leading to more active involvement in the learning process [21]. This underscores the crucial role of perceived teaching styles in fostering academic resilience among students.

Self-Determination Theory (SDT) and Social Cognitive Theory (SCT) provide complementary frameworks for understanding the mediating role of academic competence [22]. SDT's emphasis on autonomy and competence directly aligns with key components of academic competence, suggesting that students who perceive their learning environment as supportive of choice and skill development are more likely to develop a strong sense of academic efficacy. SCT further illuminates this process by emphasizing the role of self-efficacy in shaping behavior and motivation [23]. By fostering beliefs in students' capabilities through supportive teaching practices, teachers can enhance academic competence, which in turn mediates the positive relationship between perceived teaching style and academic resilience.

Perceived teaching styles are a multidimensional concept encompassing information presentation, student communication, classroom management, and student interactions [20]. These styles play a crucial role in shaping effective teaching approaches and enhancing students' learning capacity. Teaching styles serve as a method for identifying learning objectives and directing the pedagogical process [24]. A key dimension of perceived teaching styles focuses on supporting students' autonomy, which involves granting choices, fostering deeper comprehension, and encouraging critical thinking [25]. Research indicates that such support facilitates positive developmental outcomes in students' learning experiences [26].

Another important dimension is the teaching structure, which significantly influences the effectiveness of the learning process [27]. This involves how teachers organize and present subject matter to create a coherent learning experience. The degree of teacher involvement and interaction with students during educational

activities is a crucial aspect of perceived teaching styles [28], contributing to a supportive and conducive educational environment.

Research has established a significant relationship between teaching style dimensions (involvement, autonomy, and structure) and students' educational and academic engagement [29]. Perceived teaching styles contribute to the development of students' academic competence and fulfill their learning expectations [30]. A supportive and adaptable teaching style fosters a positive learning environment, motivating students to confront challenges and nurturing their academic resilience [31]. Teaching methodologies that promote a growth mindset, student ownership of learning, and emotional support equip students with coping strategies to manage academic stress and setbacks, enhancing their overall academic competence [32]. Academic competence is defined as a comprehensive set of skills, attitudes, and behaviors that influence teachers' evaluations of students' performance and academic progress [33]. It integrates explicit and implicit knowledge, behaviors, and skills, enabling students to fulfill their academic responsibilities effectively. This multifaceted construct encompasses various learner abilities, attitudes, and behaviors that contribute to academic achievements throughout the educational journey [34].

Academic competence is a multifaceted construct encompassing learners' self-assessment of their abilities, beliefs about resource requirements for academic success, and a sense of efficacy in navigating the academic environment [34]. Rooted in previous educational experiences, academic competence significantly influences subsequent academic outcomes [35]. An integral aspect of academic competence is the belief in one's capability to successfully accomplish tasks within a specific academic domain. Drawing upon Self-Determination Theory (SDT), which emphasizes the importance of autonomy, competence, and relatedness for intrinsic motivation, students are more likely to actively engage in school-related activities when they find these activities interesting, relevant to their lives, and affirming of their competence [36]. Positive reinforcement enhances students' academic engagement and performance. Academic competence significantly influences adolescents' future success as adults [37]. Research indicates that low academic competence can lead to decreased motivation, disengagement, and hindered academic progress [33]. Thus, nurturing academic competence is crucial for fostering motivation, engagement, and overall academic success [35]. Understanding and supporting students' self-perceptions and beliefs in academic competence is vital for educators and stakeholders, contributing significantly to students' development and future achievements [38]. This study builds on the literature on academic resilience, perceived teaching styles, and academic competence in adolescence, emphasizing the need for a comprehensive understanding of these constructs to illuminate their complex interplay and influence on student outcomes.

Academic resilience, as a dynamic process, encompasses various factors including, but not limited to, emotional regulation, problem-solving, and goal orientation [Citation]. Previous studies have linked academic resilience to positive outcomes such as enhanced academic performance, increased school engagement [39] and improved mental health [40]. Perceived teaching style, primarily focusing on autonomy-supportive and controlling dimensions, has been shown to influence student motivation, engagement, and academic performance [41–43].A clear understanding of how these teaching styles relate to academic resilience is essential for informing effective pedagogical practices.Academic competence, as defined by the ACES, encompasses a range of academic skills, enablers, and dispositions. Research has consistently linked academic competence to academic achievement and success [44–47]. While factors such as motivation, interpersonal skills, and engagement are components of academic competence, it is essential to differentiate them from broader constructs like mental health and overall well-being. To provide a robust theoretical foundation for this study and to connect these constructs, we will draw on established theories such as Bandura's Social cognitive theory (SCT) and Self-Determination Theory (SDT) of [48]. These theories will help us understand how perceived teaching styles, by fostering students' beliefs in their capabilities (self-efficacy) and providing opportunities for choice and control over learning (self-determination), influence their academic resilience. This research has suggested that an autonomy-supportive teaching style positively influences students' perception of academic competence, thereby contributing to higher levels of perceived autonomy [24, 49].

This study is grounded in several interrelated theoretical perspectives. The SDT provides a foundational framework, emphasizing the importance of satisfying students' basic psychological needs for autonomy, competence, and relatedness to foster intrinsic motivation. Social cognitive theory (SCT) complements SDT by highlighting the role of self-efficacy in shaping academic behavior. SCT posits that individuals' beliefs about their capabilities influence their motivation and performance. Resilience theory offers insights into how individuals cope with adversity, emphasizing the role of protective factors in mitigating the impact of risk factors. By integrating these theories, this study aims to understand how perceived teaching style, through its impact on students' sense of competence and autonomy, contributes to the development of academic resilience.

Previous research has independently examined perceived teaching style, academic competence, and academic resilience, but their interrelationships remain understudied. While potential connections between these variables have been suggested [21, 50], empirical evidence supporting direct links is limited. Based on the SDT, we hypothesize that teaching styles that foster autonomy and competence (e.g., authoritative, democratic) will be positively associated with academic resilience. Moreover, drawing on Social Cognitive Theory (SCT), we expect that perceived teaching style will influence academic competence, which in turn will predict academic resilience. This study aims to fill this gap by empirically testing these hypotheses and investigating the mediating role of academic competence in the relationship between perceived teaching style and academic resilience among adolescents.

Methods

This descriptive correlational study was conducted between June 2022 and December 2022 among high school students in Tehran, Iran.

Sampling method

The statistical population for this study comprised all high school students in Tehran. To ensure a representative sample, a stratified random sampling technique was employed. The population was stratified by grade level (9th, 10th, 11th, and 12th) and gender to account for potential differences in academic experiences and outcomes across these groups. To determine the sample size, G*Power software was utilized based on a medium effect size ($f^2 = 0.15$), an alpha level of 0.05, and a power of 0.80, resulting in a required sample of 400 participants. This sample size was proportionally allocated across the strata to maintain representativeness. Random selection of students within each stratum was conducted using a table of random numbers. Inclusion criteria for participation included being enrolled in a high school in Tehran and providing written informed consent. Exclusion criteria were not applicable in this study. Demographic data collected included age, grade level, gender, parents' educational level, and family income. The mean age of participants was 16.23 years (SD = 1.05). The sample comprised 179 boys (44.8%) and 221 girls (55.2%). Regarding grade level, 103 students were in 9th grade (25.8%), 97 in 10th grade (24.3%), 105 in 11th grade (26.3%), and 95 in 12th grade (23.8%). The majority of participants' parents had completed high school (45%), followed by a bachelor's degree (30%), and a master's or higher degree (25%). Family income was categorized into three levels: low (20%), middle (50%), and high (30%).

Data collection

To enhance the quality of data collection while upholding ethical standards, we implemented several measures. We provided explicit information to participants regarding the study's objectives to promote transparency and written informed consent was obtained from all participants and their parents or legal guardians before data collection, and data were collected electronically using Google Forms to ensure anonymity. All research procedures followed ethical guidelines, with a dedicated email address and phone number included in the written informed consent document and the initial questionnaire to facilitate effective communication and address inquiries promptly. Email served as the primary communication method for questions related to the questionnaire, technical difficulties, and study procedures, while a phone number was provided for immediate assistance if needed. Inquiries were addressed within 24 h to build trust and ensure participant satisfaction. We established a dedicated communication channel where participants could submit questions via email or telephone, and a designated research team member responded within 24 h to accommodate preferences and ensure accessibility. Adequate time was allocated for participants to complete the questionnaires, allowing for careful consideration of responses and minimizing rushed or incomplete answers. Questionnaires were designed to fit participants' schedules and commitments to reduce disruptions and maximize engagement. Finally, we used a secure online platform for questionnaire administration to prevent issues with misplaced or lost physical documents, ensuring the security and integrity of the data collection process, with mandatory response fields to minimize missing data.

Throughout our research, we remained dedicated to upholding ethical guidelines and standards. We prioritized the principles of respect, beneficence, and justice to protect participants' rights and well-being. Adhering to these ethical considerations, we aimed to maintain the integrity and validity of our study.

Measures

The **Academic Resilience Inventory (ARI)**, originally developed and validated by Samuel in 2004, was utilized as the measurement tool for assessing academic resilience in our research study [51]. The ARI consists of 29 items and encompasses three subscales: positivity (items 1, 2, 3, 9, 21, 22), future orientation (items 24, 20, 19, 18, 17, 16, 12, 8, 6, 4), and communication skills (items 26, 25, 23, 15, 14, 13, 11, 10, 7, 5, 29, 28, 27). Participants were asked to rate their academic resilience on a five-point Likert scale ranging from "strongly agree" (5) to "strongly disagree" (1). Notably, within the 29 items, items 4, 5, 7, 10, 11, 14, 15, 23, 27, 28, and 29 were scored inversely.

In the context of Iran, the Academic Resilience Inventory underwent standardization, resulting in a reduction of the item count from 40 to 29. This adjustment was based on the factor loads of the items. Items 4, 10, 11, 15, 18, 19, 20, 32, and 38 were excluded due to their high similarity in factor loads. The items 7 and 21 were removed due to having a factor load of less than 0.30 [52]. In a study [53], total of 29 items were selected for the confirmatory factor analysis. The reliability of the questionnaire was assessed in two separate samples of high school and college students. The reliability of the ARI subscales was assessed using Cronbach's alpha. For the communication skills component, reliability coefficients of 0.77 and 0.76 were observed among high school and college students, respectively. The future orientation component demonstrated reliability coefficients of 0.68 and 0.65 for students, respectively. These coefficients indicate acceptable internal consistency for both subscales. In the current study, the ARI subscales exhibited satisfactory internal consistency, with Cronbach's alpha coefficients of 0.82 for positivity, 0.79 for future orientation, and 0.85 for communication skills. The overall reliability of the ARI, as determined by Cronbach's alpha, was 0.78.

Teacher as Social Context (TASC) [54] was employed in this study. TASC is based on the three fundamental psychological needs framework established by Self-Determination Theory (SDT) [48]. It is a reliable and valid measure used to assess student perceptions of teacher support in the educational context, focusing on the three dimensions of basic psychological needs. The questionnaire comprised 24 items, with eight items each for involvement, structure, and support. Participants responded on a 4-point Likert scale ranging from 1 (completely not true) to 4 (completely true). To ensure linguistic and cultural appropriateness, the Persian version of TASC was utilized following the guidelines of the International Test Commission [55]. The translation and back-translation process involved two educational researchers, one developmental psychologist, and one English lecturer, all proficient in the Persian language. The Persian version of the questionnaire demonstrated satisfactory psychometric properties in Iran, with reported reliability coefficients of 0.84 for involvement, 0.90 for structure, and 0.69 for support [56]. In the current study, Cronbach's alpha was employed to assess the internal consistency reliability of the TASC dimensions. The results indicated satisfactory internal consistency, with Cronbach's alpha values of 0.78 for involvement, 0.81 for structure, and 0.75 for support. The overall Cronbach's alpha for the TASC dimensions was 0.75, demonstrating the overall reliability of the instrument in this context.

The **Academic Competence Evaluation Scale (ACES)** is a comprehensive scale that was designed to evaluate social, behavioral, and academic skills necessary to assess students' readiness for higher education and career success. The ACES was developed in 1999 as a valuable instrument for assessing the academic performance of primary and secondary school students. This tool holds significant importance in evaluating various aspects of academic competence [57]. Comprising a total of 66 items, the ACES questionnaire utilizes a 5-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree), to gather responses. It encompasses various dimensions, including academic skills in areas such as reading, language, mathematics, and critical thinking. While these dimensions might be interpreted as subscales, it is important to clarify that the ACES provides a global score of academic competence, which reflects an overall measure of a student's academic abilities and enablers. These enablers include motivation, interpersonal skills, engagement, and study skills, all of which are critical for students' overall academic success [58]. The ACES provides researchers and educators a comprehensive framework for evaluating students' academic skills and self-efficacy, thereby enabling a deeper understanding of their strengths and areas for improvement. By assessing critical aspects of academic performance, ACES contributes to enhancing educational practices and fostering student success [59]. To ensure the reliability of the scale, Cronbach's Alpha coefficient ($\alpha=0.88$) was employed as a statistical measure [57]. This assessment revealed a high level of internal consistency, indicating the scale's ability to consistently measure the intended constructs. The Persian version of the scale demonstrated satisfactory psychometric properties in Iran, with a reported reliability coefficient of 0.87 [60]. In the current study, Cronbach's alpha was employed to assess the internal consistency reliability of the total ACES score, resulting in a coefficient of 0.78, indicating acceptable reliability. Although the ACES encompasses various dimensions, in the present study, the ACES was considered as a single, global measure of academic competence.

Data analysis
Descriptive statistics (e.g., mean, standard deviation, correlation matrix) and inferential statistics (e.g., path analysis) were used to analyze the data through SPSS-23 and LISREL version 8.7.2.

Results
Descriptive statistics for the study variables are presented in Table 1.

Before conducting the path analysis, the requisite assumptions for this analytical technique were rigorously evaluated. The normality of the data distribution was assessed through an examination of skewness and kurtosis values. Values of skewness and kurtosis less than 2 and 7, respectively, indicate approximate normality [61].
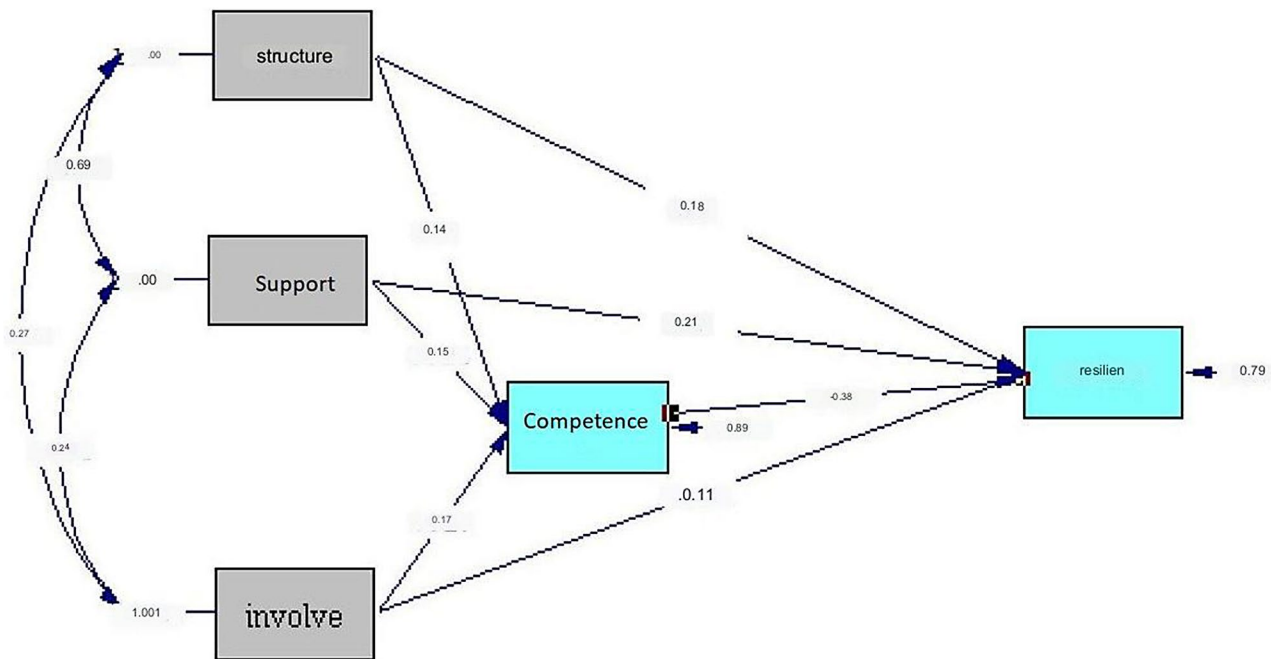
Table 1 Descriptive findings of research variables

Variable	Mean	Standard deviation	Kurtosis	Skewness
Resilience	3.39	2.51	0.61	1.21
Academic Competence	3.10	2.27	0.23	0.87
Involvement	3.87	3.64	0.76	0.98
Structure	3.67	3.92	0.80	1.12
Support	3.54	3.26	0.21	0.56

Table 2 Pearson correlation matrix of research variables

Variables	Involvement	Structure	Support	Academic competence	Resilience
Involvement	1				
	-				
Structure	0.28**	1			
	0.001	-			
Support	0.24**	0.33**	1		
	0.001	0.001	-		
Academic Competence	0.53**	0.44**	-0.41**	1	
	0.001	0.0001	0.001	-	
Academic Resilience	0.59**	0.49**	0.45**	0.55**	1
	0.001	0.0001	0.0001	0.001	-

The results revealed that skewness and kurtosis indices for all variables fell within these prescribed thresholds suggesting that the data exhibited a normal distribution. The homogeneity of variances was subsequently confirmed through the application of Levene's test. These preliminary assessments provided robust support for the suitability of path analysis in the context of the current investigation. Notably, the results of Levene's test were non-significant ($p > .05$), definitively indicating that the assumption of homogeneity of variance was satisfied.

The results of Levene's test confirmed the homogeneity of variances. These preliminary assessments support the suitability of path analysis for the current study.

Based on Table 2, there is a significant relationship between the research variables ($p < .05$). After confirming correlations among the variables, the examination will proceed to the non-standardized and standardized regression coefficients, which represent the path model analysis of resilience based on structural involvement and support with academic competence as the mediator.

To determine the adequacy of fit for the proposed model, a combination of fit indices was used, and results are presented in Table 3.

Table 3 presents the fit indices of the proposed model. The values of these indices indicate that the proposed model has a good fit with the data and effectively accounts for the relationships between the research

Table 3 Fit indices of the proposed model in the research

	CMIN	df	CMIN/df	p	GFI	AGFI	GFI	IFI	TLI	CFI	PCFI	NFI	RMSEA
Fit Indices criteria	-	-	1–5	>0.05	>0.90	>0.90	>0.90	>0.90	>0.90	>0.90	≥0.50	≥0.95	0.6–0.8
Proposed model	325.46	222	1.46	0.23	0.953	0.924		0.955	0.957	0.96	0.714	0.966	0.076
Findings	-	-	+	+	+	+		+	+	+	+	+	+

Fig. 1 Path coefficients of academic resilience model based on structure, involvement and support with academic competence mediation
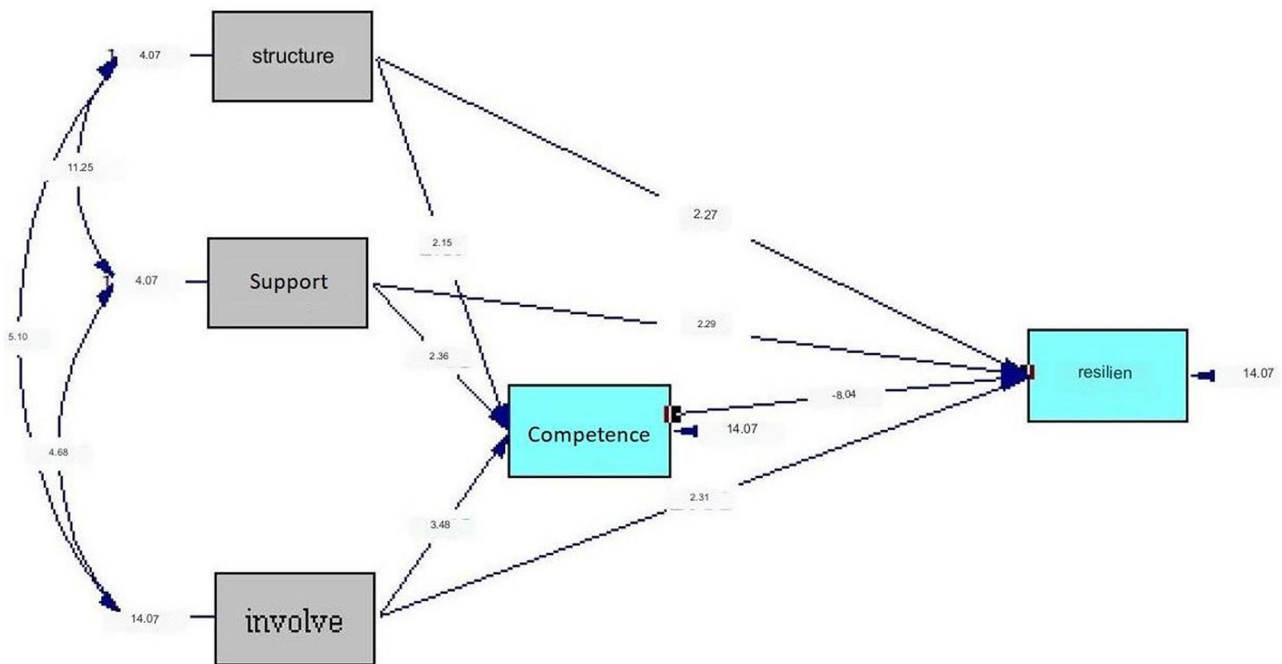

Fig. 2 T-values of academic resilience model based on structure, involvement and support with academic competence mediation

Table 4 Bootstrap analysis for indirect paths

Paths of model	lower bound	Upper bound	Confidence interval	Indirect paths
Involvement→ Resilience	-0.114	-0.99	0.95	0. 053
Structure → Resilience	-0.156	-0.111	0.95	0.057
Support→ Resilience	-0.245	-0.136	0.95	0.064

variables. These criteria are commonly used in path analysis research to assess model fit [62].

The coefficients of variable paths are shown in Fig. 1.

The t-values for the academic resilience model are presented in Fig. 2.

As shown in Figs. 1 and 2, teaching style has a significant direct negative effect on academic resilience (β =

-0.22, t = -3.12, *p*<.01). Support has a significant direct negative effect on academic resilience (β = -0.25, t = -3.56, *p*<.01), while involvement has a significant direct negative effect on academic resilience (β = -0.19, t = -2.71, *p*<.01). Teaching style explains 15% of the variance in academic resilience.

Bootstrapping analysis was employed to examine the mediating role of academic competence in the relationship between teaching styles and resilience.

According to Table 4 and considering that, zero scores are not found in the upper and lower ranges, mediating role of academic competence in the relationship between teaching styles and resilience is confirmed.

Discussion
Studying as a student can be stressful, especially when facing academic challenges [19, 63]. Our findings underscore the pivotal role of academic competence as a mediator in this relationship. By demonstrating that academic competence significantly mediates the influence of perceived teaching style on academic resilience, we contribute to a deeper understanding of the factors shaping students' ability to navigate academic challenges.

This study's findings illuminate the complex interplay between perceived teaching style, academic competence, and academic resilience among adolescents. By demonstrating the mediating role of academic competence, we contribute to a deeper understanding of how teaching practices influence students' ability to navigate academic challenges. These results extend previous research on supportive teaching styles [20, 27, 64–66] by elucidating the underlying mechanism through which teaching style impacts resilience.

Our analysis reveals that the relationship between perceived teaching style and academic resilience is not direct, but rather operates through the development of academic competence. This finding suggests that supportive and engaging teaching practices may enhance students' belief in their academic abilities, which in turn fosters resilience. This mechanism aligns with self-efficacy theory [67], which posits that individuals' beliefs about their capabilities significantly influence their performance and persistence in challenging situations.

The identified mediating role of academic competence corroborates existing research emphasizing the significance of self-beliefs in academic achievement [30, 39, 68, 69]. Our findings suggest that students who perceive themselves as academically competent are more likely to approach academic challenges with determination and perseverance, thereby enhancing their academic resilience. This underscores the importance of cultivating a sense of mastery and self-efficacy in students to bolster their resilience when confronting academic difficulties.

The positive correlation between perceived teaching style and academic resilience, mediated by academic competence, highlights the pivotal role of teachers in creating a supportive learning environment. This finding extends previous work [65, 66] on teacher-student relationships, suggesting that supportive teaching styles may have far-reaching effects beyond immediate academic performance, influencing students' long-term ability to overcome academic setbacks.

Our results have significant implications for educational practice and policy. They suggest that interventions aimed at enhancing students' academic competence, alongside efforts to promote supportive teaching styles, may have a synergistic effect on fostering academic resilience. This dual approach could create a positive feedback loop, where improved academic competence enhances resilience, which in turn supports academic achievement [70]. The study emphasizes the importance of creating a positive and supportive learning environment through effective teaching methods, as this can positively influence students' emotional well-being and self-perception, ultimately contributing to their academic resilience. The mediating role of academic competence highlights the significance of students' self-beliefs and perceptions of their academic abilities in shaping their ability to overcome academic obstacles effectively. The findings support previous literature that emphasizes the positive association between supportive teaching styles and academic resilience, as well as the importance of fostering students' sense of competence and self-efficacy to enhance their resilience. Overall, this research provides valuable insights for educators, policymakers, and researchers in promoting academic resilience among adolescents, which can lead to improved academic outcomes and well-being.

Limitations
This study is subject to several limitations that warrant consideration. The reliance on self-reported data, while economical, may introduce bias and limit the breadth of information. Moreover, the correlational design precludes causal inferences about the relationship between perceived teaching style, academic competence, and academic resilience. The study's generalizability might be constrained by its focus on a specific population and geographic region. The exclusive use of questionnaires may overlook valuable insights obtainable through alternative data collection methods. The study does not account for potential mediating variables or explore differences based on gender, culture, or age. These limitations underscore the need for future research employing mixed methods, larger samples, and a broader range of participants to enhance the understanding of these complex relationships.

Implications and recommendations for future researches

The study's findings underscore the pivotal role of supportive teaching styles and academic competence in cultivating adolescent resilience. Practical implications encompass implementing teacher training to enhance supportive teaching practices and providing comprehensive support to strengthen students' academic self-efficacy. Future research should prioritize experimental and longitudinal designs to establish causality, explore the mediating role of academic resilience, and examine the influence of cultural and contextual factors. Developing and evaluating resilience-focused interventions is essential for practical application. Ultimately, this research contributes to a deeper understanding of the complex interplay between teaching styles, academic competence, and resilience, informing future research and educational policies. It is proposed that academic resilience be investigated as a mediating variable in the relationship between teaching styles and academic competence. An experimental study could be conducted to assess the efficacy of academic resilience interventions in enhancing academic competence.

Conclusion

In conclusion, this original and groundbreaking research sheds valuable light on the crucial interplay between perceived teaching style, academic competence, and academic resilience among adolescents. The meticulously conducted study not only establishes a significant relationship between teaching style and academic resilience but also highlights the mediating role of academic competence, revealing a nuanced understanding of the factors that contribute to students' ability to overcome academic challenges. Given the far-reaching implications of these findings, a compelling call to action emerges for educators, policymakers, and stakeholders in education. By emphasizing the need to prioritize effective teaching methodologies and student-centered approaches, this research underscores the transformative potential of fostering a positive and supportive learning environment. Through the cultivation of academic competence and resilience among adolescents, we possess the capacity to empower the younger generation in confronting adversities and fostering academic excellence, facilitating their holistic personal and intellectual development. Considering these profound insights, it becomes imperative for the education community to proactively embrace and execute the recommendations delineated by this research. By undertaking this crucial endeavor, we can collaboratively lay the groundwork for a more promising and resilient future for our students. The pursuit of further inquiry into these concepts and the continued investigation within this domain will assuredly yield even more invaluable contributions to the field of education.

Abbreviations

ARI	Academic Resilience Inventory
TASC	Teacher as Social Context
ACES	Academic Competence Evaluation Scale
SDT	Self-Determination Theory
SCT	Social Cognitive Theory
SPSS	Statistical Package for the Social Sciences
LISREL	Linear Structural Relations
GFI	Goodness of Fit Index
AGFI	Adjusted Goodness of Fit Index
IFI	Incremental Fit Index
TLI	Tucker-Lewis Index
CFI	Comparative Fit Index
PCFI	Parsimony Comparative Fit Index
NFI	Normed Fit Index
RMSEA	Root Mean Square Error of Approximation
CMIN	Chi-square Minimum (also known as χ^2)
df	Degrees of Freedom
SD	Standard Deviation

Data availability
No datasets were generated or analysed during the current study.

Declarations

Ethics approval and consent to participate
The ethics committee of Alzahra University approved the study procedures (IR/12/11/1400). All aspects of the research involving human participants adhered to the ethical standards set by the National Research Committee, the Helsinki Declaration of 1964, subsequent revisions, or equivalent ethical guidelines.

Consent for publication
Not applicable.

Competing interests
The authors declare no competing interests.

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