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The Role of Teacher Leadership Components in Students' Academic Responsibility and Self-Regulation: The Mediating Role of Self-Directed Learning

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ABSTRACT

Purpose: This study aimed to examine the relationships between teacher leadership components and students' academic responsibility and academic self-regulation, with particular emphasis on the mediating role of self-directed learning among lower-secondary school students.

Methods and Materials: This descriptive-correlational study was conducted among lower-secondary school students in Salah al-Din Governorate, Iraq, and their teachers during the 2025 academic year. Using multistage cluster sampling, 400 students and 400 of their teachers were selected. Data were collected using the Hoveyda et al. Teacher Leadership Scale, Lewis Student Responsibility Questionnaire, Zimmerman and Pons Self-Regulation Scale, and Fisher and King Self-Directed Learning Questionnaire. The hypothesized relationships among the study variables were analyzed using partial least squares structural equation modeling (PLS-SEM), which enabled simultaneous assessment of the direct and indirect effects specified in the proposed conceptual model.

Findings: The inferential results demonstrated significant relationships between teacher leadership and self-directed learning, academic responsibility, and academic self-regulation. Self-directed learning was also significantly related to both academic responsibility and academic self-regulation. Furthermore, the structural model supported significant indirect effects of teacher leadership on academic responsibility and academic self-regulation through self-directed learning, confirming the mediating role of self-directed learning in the proposed relationships. Thus, stronger teacher leadership was associated with enhanced student responsibility and self-regulatory functioning both directly and through the development of self-directed learning.

Conclusion: The findings indicate that teacher leadership represents an important educational factor associated with students' academic responsibility and self-regulation, while self-directed learning serves as a meaningful mechanism through which these relationships operate. Strengthening teacher leadership competencies and simultaneously developing students' self-directed learning skills may therefore provide an effective educational pathway for promoting greater responsibility, autonomous learning, and academic self-regulation among lower-secondary school students, with potential benefits for their broader academic and psychoeducational outcomes.

Keywords: Teacher leadership; self-directed learning; academic responsibility; academic self-regulation; students.

1. Introduction

Contemporary educational systems increasingly emphasize not only the acquisition of disciplinary knowledge but also the development of students' capacity to assume responsibility for their learning, regulate their academic behavior, and function as increasingly autonomous learners. This shift reflects a broader movement from teacher-centered instruction toward learning environments in which students are expected to participate actively in goal setting, planning, monitoring, evaluation, and adjustment of their learning processes. Within this framework, teachers are no longer viewed exclusively as transmitters of knowledge; rather, they are increasingly conceptualized as instructional leaders who shape classroom norms, organize learning opportunities, create motivational conditions, model effective learning behavior, and influence students' willingness to take ownership of their academic development. Teacher leadership has therefore emerged as an important construct linking teachers' professional influence with classroom processes and student outcomes (Wenner & Campbell, 2017). In its broadest sense, teacher leadership includes forms of influence exercised by teachers within and beyond the classroom to improve teaching, learning, collaboration, and educational development, while its classroom manifestation is particularly relevant to students because it is experienced directly through instructional organization, interpersonal interactions, expectations, feedback, and support (Warren, 2021).

The theoretical and empirical literature on teacher leadership suggests that leadership exercised by teachers may affect students through several interconnected mechanisms. Teacher leaders can create a coherent learning environment, communicate clear expectations, demonstrate professional competence, encourage responsibility, promote collaborative participation, and establish a classroom climate that supports both autonomy and achievement. The literature review conducted by Wenner and Campbell emphasizes that teacher leadership is a multidimensional concept grounded in both organizational and instructional processes, with influence extending from professional collaboration to classroom improvement (Wenner & Campbell, 2017). At the classroom level, leadership is expressed through teachers' ability to guide, motivate, organize, and influence students in ways that facilitate active engagement in learning. Erdel and Takkaç similarly conceptualize teacher leadership inside the classroom as a meaningful contributor to effective teaching, emphasizing

the teacher's role in establishing productive learning conditions and directing students toward purposeful participation (Erdel & Takkaç, 2020). Warren also argues that classroom leadership skills are central to effective teaching because teachers must simultaneously manage instruction, relationships, expectations, student behavior, and motivational processes (Warren, 2021). Consequently, teacher leadership may reasonably be expected to influence not only immediate classroom participation but also students' broader academic dispositions, including responsibility, self-directed learning, and self-regulation.

The importance of teacher leadership becomes particularly evident when it is considered in relation to students' psychological and motivational experiences. Teachers' leadership behaviors can shape whether students perceive the classroom as supportive, structured, autonomy-enhancing, and conducive to competence development. Moreno-Casado et al., using a multilevel approach, examined teacher leadership in relation to students' psychological needs, highlighting the relevance of leadership practices to the motivational conditions experienced by students in educational settings (Moreno-Casado et al., 2022). Similarly, Öqvist and Malmström demonstrated the importance of teacher leadership in understanding student motivation and self-efficacy, suggesting that teachers' leadership behaviors may contribute to how students evaluate their own capacity to engage successfully with academic tasks (Öqvist & Malmström, 2018). More recent evidence also links teacher leadership with student self-determination, indicating that the effects of teacher leadership may depend partly on broader contextual factors such as institutional support and classroom climate (Assefa et al., 2025). These findings reinforce the view that teacher leadership is not merely an organizational characteristic of schools but also an interpersonal and instructional force that may influence students' internal motivational resources and learning-related behaviors.

The effects of leadership on students should also be understood within the wider school leadership environment. Although teacher leadership differs from formal administrative leadership, distributed and instructional leadership practices can create conditions that influence classroom instruction and teacher behavior. Bellibaş et al. found that instructional leadership and distributed leadership are associated with teachers' classroom practices and instructional quality, demonstrating that leadership processes within schools may translate into meaningful

differences in the quality of students' learning experiences (Bellibaş et al., 2021). Teacher leadership may therefore represent the proximal classroom-level expression of a broader leadership ecology, in which teachers exercise professional judgment and influence while interacting directly with students. This perspective is especially important in educational systems undergoing organizational, social, or political disruption. In the Iraqi context, teacher leadership and teacher identity have been examined under turbulent conditions, indicating that teachers' leadership roles may become particularly significant when schools operate in uncertain or rapidly changing environments (Altae, 2022). Such contextual considerations suggest the need to examine teacher leadership empirically in Iraqi schools rather than assuming that findings obtained in other educational systems can be generalized directly.

One student outcome that may be particularly sensitive to teacher leadership is academic responsibility. Academic responsibility refers to students' willingness and capacity to accept ownership of their academic behavior, decisions, effort, obligations, and consequences. Responsible students are expected to recognize their role in learning, fulfill academic duties, regulate their conduct, and respond constructively to the demands of the educational environment. Responsibility is not developed in isolation; rather, it is influenced by interactions among individual motivation, family processes, classroom climate, teacher expectations, and opportunities for autonomy. Bodur and Aktan showed that students' personal responsibility is associated with academic motivation and parental attitudes, indicating that responsibility is embedded within a broader network of motivational and social influences (Bodur & Aktan, 2021). Manzano-Sánchez et al. further demonstrated that responsibility is related to students' psychological needs, motivation, school social climate, and future academic expectations, suggesting that the development of responsibility may depend substantially on how students experience their learning environment (Manzano-Sánchez et al., 2021). These findings imply that teacher leadership may be one of the contextual resources through which schools encourage students to become more accountable and personally engaged in their educational progress.

The design of the learning environment can likewise influence whether students assume personal responsibility for learning. Sasson and Yehuda emphasized the importance of redesigning learning environments to enhance student motivation and personal responsibility, demonstrating that instructional arrangements can influence students'

willingness to take ownership of learning (Sasson & Yehuda, 2023). This is particularly relevant to teacher leadership because leadership practices determine, in part, how classroom structures are designed and enacted. Teachers who establish expectations, provide opportunities for participation, communicate meaningful goals, and encourage students to make decisions about their learning may foster a stronger sense of academic responsibility than teachers who rely primarily on externally controlled learning arrangements. At the same time, responsibility is closely connected with students' capacity to regulate their own behavior. Academic responsibility requires more than compliance with external expectations; it requires students to internalize goals, monitor progress, manage effort, and persist when academic difficulties arise. Thus, academic responsibility is conceptually intertwined with academic self-regulation.

Academic self-regulation is a multidimensional process through which students actively manage their cognition, motivation, behavior, and learning environment in pursuit of academic goals. Zimmerman's conceptual framework describes academic self-regulation as involving processes such as goal setting, strategic planning, self-monitoring, self-evaluation, effort regulation, and adaptive responses to feedback (Zimmerman, 2023). Self-regulated students do not merely react to instructional demands; they participate actively in directing their own learning by selecting strategies, evaluating their performance, and modifying their approaches when needed. The educational significance of self-regulation is substantial because it is associated with both immediate academic functioning and longer-term developmental outcomes. Robson et al., in a meta-analytic review, showed that self-regulation in childhood predicts a range of later outcomes, demonstrating that self-regulatory capacities have implications extending beyond single academic tasks or school years (Robson et al., 2020). Accordingly, interventions and educational practices that strengthen students' self-regulation may have enduring academic, psychological, and behavioral benefits.

Self-regulation is also closely related to student well-being. Rodríguez et al., in a systematic review, identified important relationships between self-regulation and students' well-being, suggesting that the ability to manage learning processes may contribute not only to academic performance but also to more adaptive psychological functioning (Rodríguez et al., 2022). This relationship is particularly relevant during adolescence, when students encounter increasingly complex academic expectations

while simultaneously developing greater independence from teachers and parents. Lower-secondary education therefore represents an important developmental period for strengthening self-regulatory competencies. During this stage, students are expected to become increasingly capable of planning their work, sustaining motivation, managing competing demands, and accepting responsibility for educational outcomes. However, the capacity to self-regulate does not emerge automatically. Educators remain important external sources of structure, modeling, feedback, and scaffolding. Winardi emphasizes the evolving role of educators in strengthening students' self-regulated learning, underscoring the importance of teacher practices that gradually support students in assuming greater control over their learning processes (Winardi, 2024).

Teacher support more generally has also been associated with important student engagement outcomes. A systematic review by Prananto et al. highlights the relationship between perceived teacher support and student engagement, indicating that students' perceptions of teachers' academic, emotional, and interpersonal support can influence their involvement in learning (Prananto et al., 2025). Although teacher support and teacher leadership are conceptually distinct, they overlap in important ways. Effective teacher leadership often incorporates encouragement, responsiveness, clear guidance, constructive feedback, and the creation of a psychologically supportive classroom. These practices may promote the motivational and behavioral conditions necessary for students to regulate themselves effectively. Teacher leadership may consequently function as an external regulatory resource that gradually contributes to the development of internal self-regulatory capacities. In this sense, teacher leadership may influence self-regulation both directly and indirectly through learning processes that emphasize greater student autonomy.

Self-directed learning represents one such process and provides a potentially important explanatory mechanism connecting teacher leadership with responsibility and academic self-regulation. Self-directed learning refers to learners' active involvement in identifying learning needs, setting goals, selecting resources and strategies, managing learning activities, monitoring progress, and evaluating outcomes. Although self-directed learning and self-regulated learning are related constructs, they are not identical. Self-directed learning emphasizes the learner's broader initiative and responsibility for directing the learning process, whereas self-regulation focuses more specifically on the cognitive, motivational, and behavioral

processes through which learning activities are controlled and adjusted. The two constructs therefore overlap substantially in their emphasis on autonomy, goal orientation, monitoring, and personal agency. Jasim Imran et al. demonstrated meaningful relationships among self-directed learning, self-regulated learning, and problem solving, supporting the proposition that self-directed learning operates in conjunction with self-regulatory processes rather than as an isolated learning characteristic (Jasim Imran et al., 2024).

The relevance of self-directed learning has increased as educational systems place greater emphasis on continuous learning, learner autonomy, and adaptability. Camacho-Zuñiga et al. discuss movement toward a continuous learning educational model, emphasizing educational experiences that encourage learners to remain actively engaged in developing knowledge and competencies across contexts (Camacho-Zuñiga et al., 2025). Such models require students to move beyond dependence on direct teacher control and to develop the ability to manage learning more independently. Likewise, Almulla's examination of factors influencing students' readiness for and practical use of teaching methods illustrates the importance of learner readiness and active engagement in educational processes (Almulla, 2023). Although that work was conducted in higher education, its underlying implication is relevant across educational levels: learning environments are more effective when students possess the competencies and motivational readiness needed to engage actively rather than passively with instructional opportunities. Developing these competencies during earlier educational stages may therefore be essential for preparing students for increasingly autonomous forms of learning later in their academic trajectories.

Teacher leadership may provide the conditions required for self-directed learning to develop. A teacher who communicates a developmental vision, demonstrates knowledge and competence, creates a positive classroom environment, promotes collaboration, reinforces responsibility, and recognizes student effort can facilitate students' transition from externally managed learning toward greater self-direction. Importantly, self-directed learning does not imply the absence of teacher guidance. Rather, effective self-direction frequently develops through appropriately structured support in which teachers provide clear expectations, model strategies, offer feedback, and progressively transfer responsibility to learners. Assefa et al. provide contemporary evidence that teacher leadership is

related to student self-determination, further supporting the possibility that leadership practices can strengthen students' autonomy-related capacities (Assefa et al., 2025). Similarly, the association between teacher leadership and students' psychological needs identified by Moreno-Casado et al. suggests that leadership may create conditions in which students feel sufficiently competent and autonomous to assume greater responsibility for their learning (Moreno-Casado et al., 2022). Self-directed learning may therefore constitute a mediating mechanism through which teacher leadership is translated into stronger academic responsibility and self-regulation.

From this perspective, a sequential process can be proposed. Teacher leadership may first influence students' perceptions of the learning environment and their willingness to take an active role in academic work. When teachers create structured but autonomy-supportive classrooms, students may become more willing to set goals, manage learning activities, and assume responsibility for their progress. These characteristics are central to self-directed learning. As self-directed learning increases, students may become better equipped to accept responsibility for academic choices and regulate their own learning behavior. This mechanism is consistent with evidence linking learning environments with responsibility (Sasson & Yehuda, 2023), teacher leadership with motivation and self-efficacy (Öqvist & Malmström, 2018), and self-directed learning with self-regulated learning (Jasim Imran et al., 2024). Accordingly, self-directed learning may explain why teacher leadership is associated with academic outcomes that depend on personal agency.

Despite increasing attention to these constructs, several gaps remain. First, much of the literature has examined teacher leadership, student responsibility, self-regulation, or self-directed learning separately or in pairwise relationships, while fewer studies have integrated these constructs within a single explanatory model. Second, research on teacher leadership has often concentrated on teachers' organizational roles, instructional improvement, or higher education populations, whereas relatively less attention has been paid to how teacher leadership is associated with the personal learning competencies of lower-secondary students. Third, although recent research has highlighted teacher leadership in Iraq (Altae, 2022), empirical evidence regarding its relationships with students' self-directed learning, academic responsibility, and academic self-regulation remains limited. This gap is important because contextual conditions can influence both teacher roles and

student learning processes. Educational relationships identified in one national or institutional setting may not necessarily operate identically in another. Therefore, examining these relationships among students in Salah al-Din Governorate can provide context-specific evidence regarding the role of teacher leadership in an Iraqi lower-secondary school environment.

A further methodological consideration concerns the simultaneous examination of direct and indirect relationships among these variables. Mediation analysis is particularly useful when the theoretical question extends beyond whether two variables are associated and instead asks through which mechanism the relationship may operate. Partial least squares structural equation modeling is well suited to prediction-oriented research involving multiple latent constructs and complex structural relationships, particularly when researchers seek to estimate both measurement and structural models simultaneously (Hair & Alamer, 2022). Current methodological guidance also emphasizes systematic assessment of reliability, convergent validity, discriminant validity, collinearity, path coefficients, explained variance, effect sizes, and indirect effects when using PLS-SEM (Hair Jr et al., 2021). Applying this framework allows teacher leadership, self-directed learning, academic responsibility, and academic self-regulation to be analyzed within an integrated model rather than as isolated variables, thereby providing a more comprehensive account of how classroom leadership may relate to student learning processes.

The educational relevance of such a model is substantial. If teacher leadership is directly associated with academic responsibility and self-regulation, strengthening teachers' leadership competencies may offer a practical avenue for improving students' academic functioning. If self-directed learning additionally mediates these relationships, interventions may need to move beyond teacher-focused development alone and incorporate deliberate strategies for increasing students' autonomy, self-management, motivation for learning, and control over learning activities. Such an approach would be consistent with emerging educational models that emphasize continuous learning and increasingly active student participation (Camacho-Zuñiga et al., 2025). It would also align with evidence suggesting that students' personal responsibility and self-regulatory capacities are associated with motivational, psychological, and longer-term developmental outcomes (Manzano-Sánchez et al., 2021; Robson et al., 2020; Rodríguez et al., 2022). Consequently, investigating these relationships may

contribute both to theoretical understanding of teacher leadership and to practical efforts aimed at strengthening students' capacity to become responsible, autonomous, and self-regulating learners.

Accordingly, the aim of this study was to determine the relationships between teacher leadership components and lower-secondary students' academic responsibility and academic self-regulation, with self-directed learning examined as a mediating variable.

2. Methods and Materials

2.1. Study Design and Participants

The statistical population of this study comprised all lower-secondary school students in Salah al-Din Governorate, Iraq, and their teachers in 2025. Based on the Krejcie and Morgan (1970) table, the minimum required sample size was 380; however, in the present study, data were collected from 400 students and 400 of their teachers. Multistage cluster sampling was employed. To collect the data, after coordination with the Directorate of Education of Salah al-Din Governorate, Iraq, and obtaining a list of the districts within the governorate, 10 schools were selected from the three districts of Tikrit, Tuz, and Samarra. Following the necessary coordination, the researchers visited the selected schools in person and administered the questionnaires to 400 students and 400 of their teachers. Of the students, 200 were female and 200 were male.

2.2. Data Collection Tools

Teacher Leadership Scale: The Teacher Leadership Scale developed by Hoveyda et al. (2017) consists of 39 items across eight dimensions: "knowledge and ability," "developmental vision," "ethics," "enhancing student responsibility," "influence," "collaboration," "creating a positive environment," and "appreciation." Responses are rated on a five-point Likert scale ranging from strongly agree to strongly disagree, with a neutral midpoint. The findings of Hoveyda et al. (2017) demonstrated satisfactory content validity, construct validity, and reliability, with a Cronbach's alpha coefficient of .93. The questionnaire was translated into Arabic by an Arabic-language specialist and a graduate student holding a master's degree in educational sciences. After reviewing the translated texts, the two specialists reached agreement on the final version. The face and content validity of the questionnaire were confirmed by two professors of educational sciences at Tikrit University,

Iraq. In the present study, the instrument demonstrated satisfactory internal consistency, with a Cronbach's alpha coefficient of .91.

Academic Responsibility Scale: The Student Responsibility Questionnaire was developed by Lewis (2001) to assess students' responsibility. It consists of 17 items and two dimensions, responsibility for "self" and responsibility for "others," and assesses students' academic responsibility using a six-point Likert scale ranging from always to never. The original developers reported Cronbach's alpha coefficients of .72 for the self-responsibility subscale and .77 for the responsibility-for-others subscale (Lewis, 2001). In the study by Mohammadi (2019), the questionnaire demonstrated satisfactory content, face, and criterion-related validity. The Cronbach's alpha coefficient calculated by Mohammadi (2019) was above .70. The questionnaire was translated into Arabic by an Arabic-language specialist and a graduate student holding a master's degree in educational sciences. Following review of the translated versions and the necessary revisions, the two specialists reached agreement on the final text. The face and content validity of the questionnaire were confirmed by two professors of educational sciences at Tikrit University, Iraq. In the present study, the Cronbach's alpha coefficient for this questionnaire was .82.

Academic Self-Regulation: Zimmerman and Pons (1986), through interviews with high school students, identified 14 self-regulated learning strategies. In this questionnaire, students are asked to rate the extent to which they use these strategies in the relevant context on a four-point Likert scale ranging from very little (score = 1), little (score = 2), sometimes (score = 3), to most of the time (score = 4). Mahmoudi (1998) reported acceptable validity based on expert judgment and reported test-retest reliability and internal consistency, measured using Cronbach's alpha, of .68 and .56, respectively. Hosseini Rad (2013) confirmed the validity of the scale using factor analysis and reported reliability coefficients of .80 and .56 using Cronbach's alpha and the Spearman-Brown split-half method, respectively. Samadi (2004) also reported reliability coefficients of .64 and .62 using the test-retest method and internal consistency, respectively. The questionnaire was translated into Arabic by two specialists, including an Arabic-language specialist and a graduate student holding a master's degree in educational sciences. After the two translated versions were compared, the final version was approved by both specialists. The face and content validity of the questionnaire were confirmed by two professors of educational sciences at

Tikrit University, Iraq. In the present study, the Cronbach's alpha coefficient for this questionnaire was .92.

Self-Directed Learning: Self-directed learning was assessed using the Fisher and King (2010) questionnaire. This instrument contains 29 items rated on a five-point Likert scale ranging from strongly disagree = 1 to strongly agree = 5. The instrument assesses three components of self-directed learning: self-management, self-control, and motivation for learning. Fisher and King (2010) reported a Cronbach's alpha coefficient of .92 for the total scale. Construct validity was reported as satisfactory based on factor analysis (Murray et al., 2001). In the study by Alinadi and Sajadian (2006), the reliability coefficient of the questionnaire was .82. To prepare the Arabic version, the questionnaire was initially translated into Arabic by two specialists, including an Arabic-language specialist and a graduate student holding a master's degree in educational sciences. After comparison of the two versions, the final version was approved by both specialists. Face and content validity were also confirmed by two professors of educational sciences at Tikrit University, Iraq. In the present study, the Cronbach's alpha coefficient for this questionnaire was .88.

2.3. Data Analysis

Given that the study was conducted in a population with limited prior empirical evidence, that the objectives emphasized theory development and prediction, and that the model included a formative construct (self-regulation), partial least squares structural equation modeling (PLS-SEM) was considered an appropriate analytical approach (Hair et al., 2017; Hair & Alamer, 2022). Accordingly, data were analyzed using PLS-SEM with SPSS 27 and SmartPLS 4.

To establish internal consistency for the reflective constructs and to assess convergent and discriminant validity in the PLS-SEM measurement model, recommended criteria include a Cronbach's alpha greater than .70, composite reliability greater than .70, average variance extracted (AVE) greater than .50, a heterotrait-monotrait ratio (HTMT) below .90, and outer loadings greater than .70 (Hair

& Alamer, 2022). For formative constructs, indicator multicollinearity, the magnitude and significance of outer weights, and, where necessary, outer loadings are evaluated. In such cases, a variance inflation factor (VIF) below 3 (or 5), statistically significant outer weights at the .05 or .10 level, and, where applicable, outer loadings greater than .50 are considered acceptable (Hair & Alamer, 2022). For the structural model, the following steps should be undertaken: assessment of multicollinearity using a VIF below 3 (or 5); assessment of in-sample predictive power through the coefficient of determination (R^2), with values ranging from .25 as small to .75 as large; assessment of effect size, from .02 as small to .35 as large; and assessment of statistical significance using 5,000 bootstrap samples (Hair et al., 2021). Mediation effects were evaluated according to the guidelines proposed by Zhao et al. (2010) and Hair et al. (2021). According to these guidelines, significant direct and indirect effects indicate partial mediation, whereas a significant indirect effect accompanied by a nonsignificant direct effect indicates full mediation.

3. Findings and Results

In the first stage of the analysis, the measurement model was assessed. In the present study, self-regulation, with 15 items; self-directed learning, with three subscales; academic responsibility, with two subscales; and teacher leadership, with eight subscales, were modeled. Table 1 presents the reliability coefficients, average variance extracted, and outer factor loadings for each reflective construct, except self-regulation, which was specified as a formative construct. Composite reliability (ρ_C) exceeded .92 for all constructs, while Cronbach's alpha exceeded .82 for the three reflective constructs; both indices were therefore within acceptable ranges. The AVE values for all variables exceeded .50, indicating acceptable convergent validity. Overall, all factor loadings exceeded .75, indicating satisfactory internal consistency and convergent validity. Table 2 presents the discriminant validity of the reflective constructs. All HTMT values were below .90, indicating acceptable discriminant validity for the study constructs.

**Table 1***Cronbach's Alpha, ρA , Composite Reliability, Average Variance Extracted, and Outer Factor Loadings of the Study Constructs*

Construct / Indicator	Factor Loading	Cronbach's Alpha	ρA	Composite Reliability	AVE
Teacher Leadership		.91	.91	.93	.62
Knowledge and Ability	.80				
Developmental Vision	.78				
Ethics	.75				
Enhancing Responsibility	.80				
Influence	.80				
Collaboration	.77				
Positive Environment	.77				
Self-Directed Learning		.88	.88	.93	.85
Self-Management	.90				
Learning Motivation	.90				
Self-Control	.90				
Academic Responsibility		.82	.84	.92	.80
Responsibility for Self	.94				
Responsibility for Others	.91				

Table 2*Discriminant Validity of the Reflective Constructs Using the Heterotrait-Monotrait Ratio*

Construct	Teacher Leadership	Academic Responsibility	Self-Directed Learning
Teacher Leadership	—		
Academic Responsibility	.42	—	
Self-Directed Learning	.45	.50	—

Self-regulation was specified as a formative construct; therefore, Cronbach's alpha, composite reliability, and average variance extracted are not applicable to its evaluation. Accordingly, indicator collinearity, assessed

through outer VIF values, and indicator significance, assessed through outer weights, were examined. Table 3 presents the outer VIF, outer weights, and outer loadings of the self-regulation indicators.

Table 3*Outer Weights and Outer Loadings of the Indicators*

Indicator	Outer VIF	Outer Weight	p -value	Outer Loading	p -value
Item 1	1.64	.03	.79	.60	< .01
Item 2	2.09	.08	.45	.73	< .01
Item 3	1.98	.10	.38	.71	< .01
Item 4	1.97	.29	.01	.81	< .01
Item 5	1.94	.03	.75	.69	< .01
Item 6	2.11	.14	.18	.74	< .01
Item 7	1.76	-.05	.61	.59	< .01
Item 8	2.07	-.01	.93	.66	< .01
Item 9	1.85	.20	.04	.74	< .01
Item 10	1.62	.16	.07	.68	< .01
Item 11	1.89	.13	.23	.69	< .01
Item 12	1.53	.07	.37	.60	< .01
Item 13	1.70	-.11	.23	.54	< .01
Item 14	2.05	.17	.09	.77	< .01
Item 15	1.88	.01	.35	.71	< .01



As shown in Table 3, the outer VIF values for all indicators were well below the conservative threshold of 3.3. This finding indicates the absence of multicollinearity among the self-regulation items. Accordingly, evaluation of the measurement model proceeded to examination of the significance of the outer weights. As shown in Table 3, several of the weights were small, which is common in broad formative composites. Moreover, some p-values exceeded .05, indicating that these indicators did not make a statistically sufficient unique contribution to the measurement of the latent construct. Under such

circumstances, researchers should determine whether to retain or remove these items on the basis of theoretical considerations and the magnitude of their outer loadings, particularly when outer loadings exceed .50 (Hair et al., 2017). Given the theoretical rationale, the absence of multicollinearity, and outer loadings above .54 for all indicators, all 15 items were retained in the present study.

In the second stage, the structural model, or inner model, was evaluated using inner-model multicollinearity estimates, coefficients of determination, effect sizes, and model-fit indices. Table 4 presents the inner VIF values.

Table 4

Assessment of Multicollinearity Among the Constructs

Predictor → Endogenous Construct	Inner VIF
Teacher Leadership → Academic Responsibility	1.20
Self-Directed Learning → Academic Responsibility	1.20
Teacher Leadership → Self-Regulation	1.20
Self-Directed Learning → Self-Regulation	1.20
Teacher Leadership → Self-Directed Learning	1.00

As shown in Table 4, the inner VIF values were low and below 3.3. Therefore, no problematic multicollinearity existed among the latent predictors in the structural model. This indicates that the constructs contributed independently to the model and were not characterized by substantial predictor collinearity. As expected, the inner VIF for the path from teacher leadership to self-directed learning was low ($VIF = 1$), because teacher leadership was the sole predictor of self-directed learning. Overall, the values presented in Table 4 indicate negligible shared variance between teacher leadership and self-directed learning when predicting the respective outcomes; therefore, the path estimates can be interpreted without concern regarding multicollinearity bias. As shown in Figure 1, the model explained 22% of the variance in academic responsibility, 17% of the variance in self-directed learning, and 31% of the variance in academic self-regulation. The adjusted values were approximately equal to the corresponding unadjusted values. In PLS-SEM, an R^2 value of approximately .50 is

generally considered moderate, whereas a value around .25 is considered weak to moderate. Therefore, the model generally explained only a limited proportion of the variance in the endogenous constructs. For self-directed learning, 17% of its variance was explained by the model, indicating relatively weak explanatory power. Nevertheless, given the size and nature of the model, these values are considered acceptable in behavioral and social science research. According to commonly used thresholds for effect size ($f^2 = .02$, small; .15, medium; and .35, large), teacher leadership had a medium effect on self-directed learning, whereas its effects on academic responsibility and academic self-regulation were small. Self-directed learning also had a small-to-medium effect on academic responsibility and a medium effect on academic self-regulation. Overall, these findings indicate that self-directed learning played a more substantial role than teacher leadership in explaining academic self-regulation, while teacher leadership exerted a notable effect on self-directed learning.

Figure 1

Tested Structural Model (Path Coefficients)

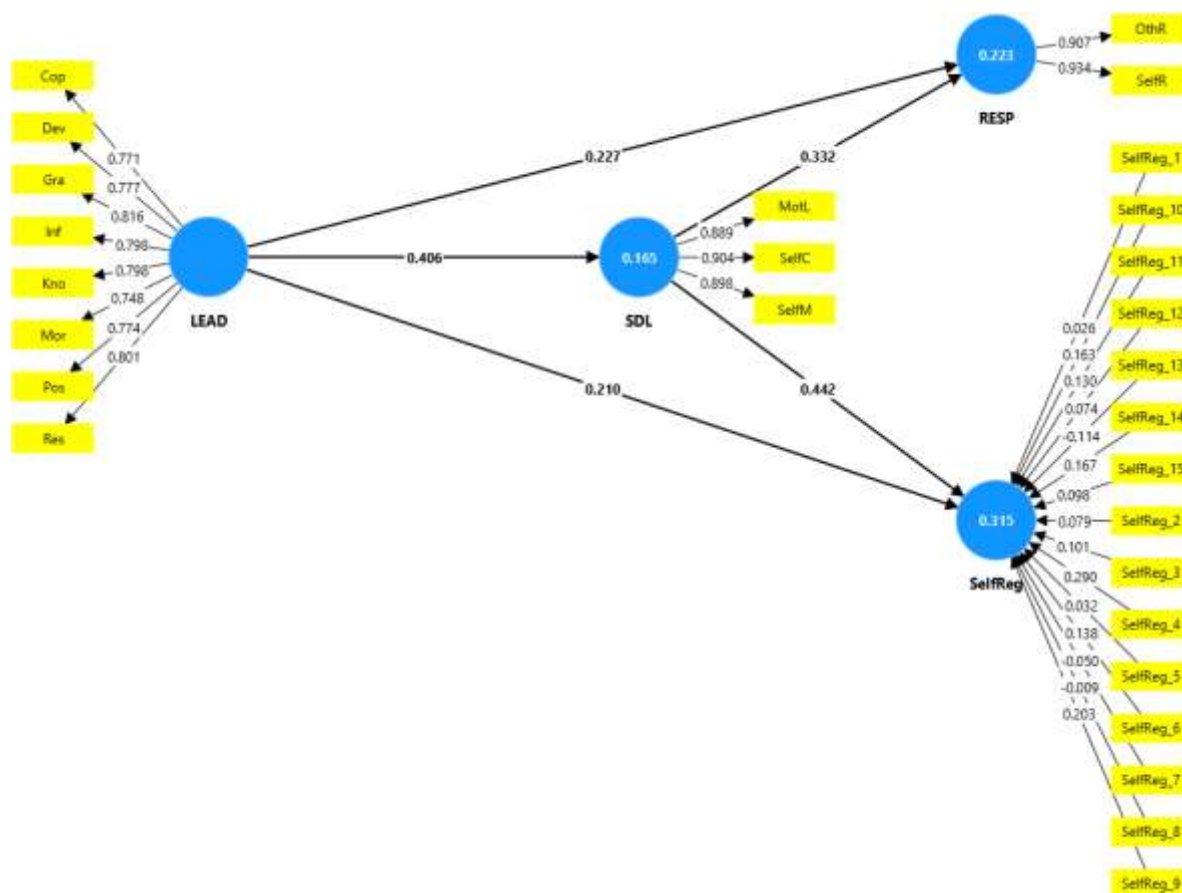


Table 5 presents the standardized direct and indirect paths based on bootstrap inference using 5,000 subsamples, a two-tailed α of .05, and percentile confidence intervals.

Table 5

Standardized Direct and Indirect Paths Based on Bootstrap Inference

Path	Direct Effect	<i>t</i>	Indirect Effect	<i>t</i>
Teacher Leadership → Academic Responsibility	.23**	4.38	.14**	5.67
Teacher Leadership → Self-Directed Learning	.41**	10.45	—	—
Teacher Leadership → Academic Self-Regulation	.21**	3.97	.18**	6.86
Self-Directed Learning → Academic Responsibility	.33**	6.93	—	—
Self-Directed Learning → Academic Self-Regulation	.44**	9.27	—	—

Teacher leadership had a positive effect on students' self-directed learning ($\beta = .41$), and the magnitude of this effect was moderate. Teacher leadership also had direct effects on academic responsibility ($\beta = .23$) and academic self-regulation ($\beta = .21$), although these path coefficients were small to moderate in magnitude. Self-directed learning also had positive and statistically significant effects on academic responsibility ($\beta = .33$) and academic self-regulation ($\beta = .44$). In addition, teacher leadership had indirect effects on

academic responsibility ($\beta = .14$) and academic self-regulation ($\beta = .18$) through self-directed learning. Because all direct and indirect paths were statistically significant, the partial mediating role of self-directed learning in the relationships between teacher leadership and both academic responsibility and academic self-regulation was supported.

4. Discussion and Conclusion

The present study examined the relationships between teacher leadership, self-directed learning, academic responsibility, and academic self-regulation among lower-secondary school students in Salah al-Din Governorate, Iraq, with particular emphasis on the mediating role of self-directed learning. The structural model showed that teacher leadership had a positive and statistically significant direct effect on self-directed learning ($\beta = .41, p < .01$), academic responsibility ($\beta = .23, p < .01$), and academic self-regulation ($\beta = .21, p < .01$). Self-directed learning also had significant positive effects on academic responsibility ($\beta = .33, p < .01$) and academic self-regulation ($\beta = .44, p < .01$). In addition, teacher leadership exerted significant indirect effects on academic responsibility ($\beta = .14, p < .01$) and academic self-regulation ($\beta = .18, p < .01$) through self-directed learning. Because both the direct and indirect effects were significant, self-directed learning was identified as a partial mediator in both relationships. The model explained 22% of the variance in academic responsibility, 17% of the variance in self-directed learning, and 31% of the variance in academic self-regulation. Collectively, these findings indicate that teacher leadership contributes to important student learning outcomes both directly and through its association with students' capacity to manage and direct their own learning.

The significant positive effect of teacher leadership on self-directed learning indicates that students are more likely to assume an active role in managing their learning when teachers demonstrate stronger leadership behaviors. This finding is theoretically plausible because teacher leadership involves more than the delivery of instructional content; it includes communicating expectations, establishing a developmental vision, creating a constructive classroom climate, modeling appropriate learning behavior, encouraging participation, strengthening responsibility, and facilitating collaboration. Such behaviors can gradually shift students from dependence on externally imposed control toward greater autonomy in planning, monitoring, and evaluating their learning. The present finding is consistent with the broader teacher-leadership literature, which conceptualizes teacher leadership as a form of professional influence capable of improving learning processes and educational environments (Wenner & Campbell, 2017). It also aligns with Warren's emphasis on the importance of leadership skills inside the classroom, particularly teachers' ability to guide students, create structure, sustain engagement, and promote productive learning behaviors

(Warren, 2021). From this perspective, self-directed learning can be understood as one of the student-level outcomes through which effective teacher leadership becomes educationally consequential.

This result also corresponds with evidence that teacher leadership can support students' autonomy-related and motivational processes. Assefa et al. showed that teacher leadership is related to student self-determination and that this relationship is shaped by the institutional and classroom environment (Assefa et al., 2025). Although self-determination and self-directed learning are not identical constructs, both require students to experience a degree of autonomy, competence, and purposeful engagement in learning. Similarly, Moreno-Casado et al. found that teacher leadership is associated with students' psychological needs, indicating that leadership practices may affect the psychological conditions under which students become willing to take greater ownership of academic activities (Moreno-Casado et al., 2022). The present results extend this line of evidence by showing that teacher leadership is positively related to self-directed learning in lower-secondary education, suggesting that teacher influence may contribute not only to motivation but also to students' practical capacity to manage their own learning.

The finding that teacher leadership directly predicted academic responsibility also supports the assumption that classroom leadership can shape students' willingness to accept responsibility for academic behaviors and outcomes. Students are more likely to internalize responsibility when teachers provide clear expectations, model accountability, recognize effort, delegate meaningful tasks, and create classroom conditions in which students are expected to participate actively rather than passively. This interpretation is consistent with Sasson and Yehuda, who showed that redesigning learning environments can enhance students' motivation and personal responsibility for learning (Sasson & Yehuda, 2023). It is also compatible with Bodur and Aktan's findings that personal responsibility is related to motivational and contextual factors rather than functioning as a purely individual characteristic (Bodur & Aktan, 2021). In the current study, the direct effect of teacher leadership on academic responsibility was statistically significant but relatively modest in magnitude. This suggests that teacher leadership contributes to responsibility, but responsibility is likely to be shaped simultaneously by several other influences, including parental expectations, peer norms, prior motivational orientations, personality characteristics, and broader school culture.

The relationship between teacher leadership and academic responsibility can also be interpreted in light of research on school climate and psychological needs. Manzano-Sánchez et al. found that responsibility is associated with motivation, satisfaction of psychological needs, and the school social climate (Manzano-Sánchez et al., 2021). Teacher leadership may influence these conditions by creating a classroom environment characterized by support, clarity, recognition, collaboration, and structured autonomy. In such an environment, students may be more likely to perceive themselves as active contributors to their learning and to accept the consequences of their academic choices. Teacher leadership may therefore contribute to responsibility by providing both external structure and opportunities for internalization. This explanation is also consistent with Öqvist and Malmström, who found that teacher leadership is related to student motivation and self-efficacy (Öqvist & Malmström, 2018). Students who believe that they are capable of succeeding and who experience stronger academic motivation may be more willing to assume responsibility for their own performance.

Teacher leadership also had a significant direct effect on academic self-regulation. This finding suggests that teachers' leadership behaviors are associated with students' ability to regulate their cognition, motivation, and academic behavior. Academic self-regulation involves processes such as setting goals, selecting learning strategies, monitoring performance, regulating effort, evaluating progress, and modifying behavior when difficulties arise (Zimmerman, 2023). Although these processes are ultimately performed by students, their development is strongly influenced by instructional and social contexts. Teachers can model strategic behavior, provide feedback, organize learning tasks, clarify goals, and progressively transfer responsibility to students. The present finding therefore supports the view that self-regulation is not merely an internal trait but a capacity that can be strengthened through interaction with the instructional environment.

This interpretation is consistent with Winardi's discussion of the changing role of educators in promoting self-regulated learning. Teachers increasingly function as facilitators who guide students toward greater control over their learning rather than simply transmitting information (Winardi, 2024). Similarly, Prananto et al. reported that perceived teacher support is closely related to student engagement, highlighting the importance of teachers' instructional and interpersonal behavior in sustaining active participation in learning (Prananto et al., 2025). Engagement

and self-regulation are conceptually distinct, but they share motivational and behavioral foundations. Students who experience supportive and well-organized teacher leadership may be more likely to sustain effort, monitor progress, and regulate their learning effectively. The present findings therefore support the proposition that classroom leadership can function as an external scaffold for the development of internal self-regulatory capacities.

The positive association between teacher leadership and self-regulation is also consistent with the broader literature concerning instructional quality and leadership. Bellibaş et al. demonstrated that instructional and distributed leadership are associated with teachers' classroom practices and instructional quality (Bellibaş et al., 2021). Higher-quality instructional environments may provide more consistent opportunities for students to practice strategic learning and independent decision-making. Erdel and Takkaç similarly emphasized the relevance of teacher leadership inside the classroom for effective instruction (Erdel & Takkaç, 2020). Together, these findings suggest that teacher leadership may affect student self-regulation because leadership is expressed through concrete instructional behaviors, not merely through formal status or professional identity. In the Iraqi context, this relationship may be particularly meaningful because teacher leadership has been described as an important aspect of teachers' professional identity under turbulent educational conditions (Altae, 2022). The current findings extend this literature by demonstrating that teacher leadership in Iraqi schools is also associated with student-level learning processes.

Another major finding was that self-directed learning significantly predicted academic responsibility. Students with stronger self-directed learning tended to demonstrate greater responsibility for their academic behavior. This association is conceptually coherent because self-directed learners are expected to identify learning needs, set goals, organize resources, manage time and activities, monitor progress, and evaluate outcomes. These processes inherently require students to accept greater ownership of their academic decisions. Therefore, self-directed learning may strengthen academic responsibility by reducing dependence on external monitoring and increasing students' perception that learning outcomes are partly determined by their own choices and actions. This interpretation is compatible with Sasson and Yehuda's emphasis on learning environments that encourage personal responsibility (Sasson & Yehuda, 2023) and with Camacho-Zuñiga et al.'s discussion of continuous-learning educational models that require greater

learner autonomy and active participation (Camacho-Zuñiga et al., 2025).

The significant relationship between self-directed learning and academic responsibility is also consistent with research emphasizing readiness and active learner participation. Almulla showed that students' readiness and practical engagement with instructional methods are important components of successful learning experiences (Almulla, 2023). Although that study focused on higher education, the underlying principle is relevant to younger learners: students who are prepared to manage learning activities actively may also be more willing to take responsibility for academic outcomes. The current findings suggest that the development of self-directed learning during lower-secondary education may be important because it can help establish patterns of responsibility before students enter more autonomous educational environments.

Self-directed learning had its strongest direct effect on academic self-regulation ($\beta = .44$), indicating that students who were more self-directed also demonstrated substantially stronger academic self-regulatory capacities. This was one of the most theoretically expected findings because the two constructs share several core processes, including goal setting, self-monitoring, strategic behavior, motivation, and evaluation. Nevertheless, they are not redundant. Self-directed learning refers more broadly to the learner's initiative and responsibility in directing the learning process, whereas self-regulation refers to the mechanisms through which learning behavior is controlled and adjusted. The current finding suggests that self-directed learning may provide the broader motivational and behavioral orientation within which self-regulatory strategies are applied.

This result strongly aligns with the findings of Jasim Imran et al., who reported significant relationships between self-directed learning, self-regulated learning, and problem-solving among university students (Jasim Imran et al., 2024). The present study extends that evidence to lower-secondary students and shows that the relationship remains substantial at an earlier educational stage. It is also consistent with Zimmerman's conceptualization of academic self-regulation as an active process requiring learners to exercise agency over goals, strategies, and performance (Zimmerman, 2023). Students who are accustomed to directing their own learning may have more frequent opportunities to practice these regulatory processes, thereby strengthening self-regulation over time.

The importance of this relationship is reinforced by evidence concerning the broader benefits of self-regulation.

Robson et al. demonstrated that self-regulation in childhood predicts important future outcomes across multiple domains (Robson et al., 2020), while Rodríguez et al. showed that self-regulation is associated with student well-being (Rodríguez et al., 2022). Therefore, the relationship between self-directed learning and academic self-regulation may have implications extending beyond immediate academic performance. Educational environments that promote self-direction may indirectly support students' long-term adaptive functioning by strengthening the capacity to organize behavior, sustain effort, and respond effectively to challenges.

A particularly important contribution of the present study was the confirmation of the partial mediating role of self-directed learning in the relationships between teacher leadership and both academic responsibility and academic self-regulation. Teacher leadership had significant indirect effects on academic responsibility and self-regulation through self-directed learning, while the corresponding direct effects remained statistically significant. This pattern indicates that teacher leadership influences these outcomes through more than one mechanism. Part of its effect appears to operate directly, perhaps through classroom structure, expectations, modeling, feedback, and interpersonal influence, whereas another part operates through students' increased capacity to direct their own learning. In practical terms, effective teacher leadership may first create the conditions under which students become more autonomous learners, and this increased autonomy may then contribute to stronger responsibility and self-regulation.

The mediation findings are consistent with a developmental view of classroom leadership. Teacher leadership may initially function as external guidance, but its educational value is greatest when that guidance is gradually internalized by students. This interpretation is supported by Assefa et al., who linked teacher leadership to student self-determination (Assefa et al., 2025), and by Moreno-Casado et al., who associated teacher leadership with satisfaction of students' psychological needs (Moreno-Casado et al., 2022). When teacher leadership enhances autonomy, competence, and purposeful engagement, students may become better able to organize their learning independently. Self-directed learning can then serve as the mechanism through which external teacher influence is translated into internally regulated academic behavior.

The findings also correspond with contemporary educational models emphasizing active and continuous learning. Camacho-Zuñiga et al. argued for educational

environments that prepare students for continuous learning and sustained adaptation (Camacho-Zuñiga et al., 2025). From this perspective, teacher leadership should not produce long-term dependence on teachers; rather, effective leadership should strengthen students' ability to function increasingly independently. The partial mediation found in the present study is consistent with this logic. Teachers remain influential, but part of their influence is realized by enabling students to become more self-directed. This interpretation also explains why self-directed learning had a stronger effect on academic self-regulation than teacher leadership did: once students develop self-directed learning capacities, these internal competencies may become more proximal determinants of self-regulatory behavior than external teacher influence.

The explained variance estimates further clarify the scope of these relationships. The model accounted for 31% of the variance in academic self-regulation, 22% in academic responsibility, and 17% in self-directed learning. These values indicate that the proposed model has meaningful but incomplete explanatory power. In behavioral and educational research, student outcomes are rarely determined by a single set of variables because they reflect interactions among personal, familial, peer, school, and contextual factors. The results therefore suggest that teacher leadership and self-directed learning are important contributors but should not be treated as comprehensive explanations of academic responsibility or self-regulation. Methodologically, the use of PLS-SEM was appropriate for evaluating these simultaneous direct and indirect relationships and for assessing the predictive structure of the proposed model (Hair & Alamer, 2022; Hair Jr et al., 2021).

This study has several limitations that should be considered when interpreting the findings. First, the cross-sectional correlational design does not permit definitive causal conclusions, even though the structural model was specified on theoretical grounds. Second, the participants were drawn from lower-secondary schools in Salah al-Din Governorate, and the findings may not generalize to students in other Iraqi governorates, educational stages, or national contexts. Third, most variables were assessed using questionnaire-based measures, which may be affected by response styles, social desirability, and common-method influences. Fourth, although teacher leadership was assessed through multiple dimensions, the model did not examine whether particular dimensions of teacher leadership were more strongly associated with self-directed learning, responsibility, or self-regulation. Finally, the model

explained only part of the variance in the endogenous constructs, indicating that additional individual, family, classroom, and school-level variables are likely to contribute to these outcomes.

Future studies should employ longitudinal and experimental designs to clarify the temporal and potentially causal relationships among teacher leadership, self-directed learning, academic responsibility, and academic self-regulation. Replication across different Iraqi governorates, educational stages, school types, and cultural contexts would improve the generalizability of the findings. Future models could examine specific teacher-leadership dimensions separately and determine which dimensions are most strongly associated with student autonomy and self-regulation. Researchers could also incorporate additional mediators and moderators, such as academic motivation, self-efficacy, classroom climate, perceived teacher support, parental involvement, socioeconomic status, and gender. Multilevel models would be particularly useful for distinguishing student-level from teacher- and school-level effects. Mixed-method studies could additionally explore how students and teachers experience leadership practices in everyday classroom interactions and explain why some leadership behaviors are more effective than others in promoting self-directed learning and responsibility.

Schools should strengthen teacher leadership as a classroom-based professional competency rather than treating leadership only as an administrative role. Professional development programs can train teachers to establish clear expectations, provide constructive feedback, support student autonomy, encourage collaborative learning, and gradually transfer learning responsibility to students. Teachers should deliberately create opportunities for students to set goals, plan assignments, select learning strategies, monitor their progress, evaluate outcomes, and reflect on difficulties. Classroom activities should also be designed to promote self-management, self-control, and motivation for learning. School leaders can support these practices by providing teachers with professional autonomy, collaborative planning opportunities, and resources for student-centered instruction. At the student level, structured programs focusing on self-directed learning and academic self-regulation may complement teacher-leadership initiatives, because the present findings indicate that strengthening students' capacity to direct their own learning may enhance both academic responsibility and self-regulatory functioning.

Authors' Contributions

All authors significantly contributed to this study.

Declaration

In order to correct and improve the academic writing of our paper, we have used the language model ChatGPT.

Transparency Statement

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Declaration of Interest

The authors report no conflict of interest.

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Ethical Considerations

In this study, to observe ethical considerations, participants were informed about the goals and importance of the research before the start of the interview and participated in the research with informed consent.

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