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The Motivational Bridge: Parental Relationship, Parental Guidance, and Academic Performance among Chinese Medical Students

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ABSTRACT

This study investigates the relationships between parental relationship, parental guidance, learning motivation, and academic performance among public medical university students in Henan Province, China, with learning motivation examined as a mediating variable. Using a quantitative design, data were collected from 517 students across two public medical universities and analysed using Partial Least Squares Structural Equation Modelling (PLS-SEM). The results show that both parental relationship and parental guidance significantly enhance learning motivation, but only parental guidance has a direct positive effect on academic performance. Learning motivation was a strong predictor of academic performance and partially mediated the relationship between parental guidance and performance, while mediation for parental relationship was not significant. These findings, interpreted through Self-Determination Theory, Social Cognitive Theory, and the Stimulus–Organism–Response framework, underscore the importance of structured parental guidance in fostering student success. The study offers practical implications for universities and parents to collaborate in creating motivation-supportive environments and recommends future research incorporating broader parental influence variables and longitudinal designs.

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KEYWORDS:

Parental relationship, Parental guidance, Learning motivation, Academic performance, Medical Students

1.0 INTRODUCTION

The academic performance of university students, particularly those in medical education, has long been a focal point for educators, researchers, and policymakers due to the intensive demands of mastering theoretical knowledge, developing clinical competencies, and sustaining emotional resilience (Infortuna et al., 2025). In China, medical training is shaped by standardized examinations, rigorous curricular frameworks, and strong parental and societal expectations. These pressures have been further intensified by shifts in educational delivery, such as the abrupt transition to online learning during the COVID-19 pandemic, which disrupted routines and increased the psychological burden on students (Ren & Du, 2024).

In Henan Province—China's third most populous region—public medical universities face the dual challenge of meeting national reform goals while addressing localized educational disparities. Students often contend with high academic loads, competitive environments, and resource imbalances, particularly those from rural or socioeconomically disadvantaged backgrounds (Tang et al., 2019). Under these conditions, identifying the determinants of academic success is essential for designing targeted interventions.

Among these determinants, parental involvement remains salient even at the university level, especially in collectivist societies where academic achievement is closely linked to family honour and upward mobility (Zhang et al., 2021). However, parental influence can take different forms. Parental relationship refers to the quality of emotional bonding, trust, and communication, while parental guidance involves academic mentoring, value transmission, and life planning support. Evidence suggests that emotional support can enhance intrinsic motivation and confidence, whereas excessive academic control may increase stress and undermine autonomy (Caiga & Liujian, 2024). Yet, few studies in Chinese medical education have examined these two dimensions separately.

Learning motivation—the inner drive that activates, directs, and sustains learning behavior—plays a pivotal role in mediating the effects of environmental factors on academic performance (Ryan, 2020; Wang et al., 2023). In high-pressure

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contexts such as medical schools, motivation not only predicts resilience and sustained engagement (Ma & Hu, 2025) but also serves as a psychological buffer against burnout (Wang & Zheng, 2023). Despite its acknowledged importance, the mediating role of motivation between parental involvement and academic outcomes remains underexplored in provincial Chinese settings.

Problem Statement

Although prior research in education and psychology has established that parental involvement and learning motivation are associated with academic success, three notable gaps remain in the context of Chinese medical education.

First, existing studies often conceptualise parental involvement as a single construct, without differentiating between its emotional dimension (parental relationship) and supervisory dimension (parental guidance). This obscures potentially distinct pathways through which these forms of involvement affect student learning.

Second, the mediating role of learning motivation in linking parental factors to academic performance is under-examined, particularly in high-pressure, exam-oriented environments such as Chinese medical universities. While motivation is known to drive persistence and deep engagement, its function as a psychological bridge between family support and performance has rarely been empirically tested in this context.

Third, research on these relationships in provincial, resource-constrained settings—such as Henan Province—is scarce, despite evidence that local academic realities differ significantly from those in China's more developed regions. As a result, current policies and interventions may overlook the unique familial and motivational dynamics that influence student achievement in these environments.

Significance of the Study

This study addresses existing research gaps by disentangling the effects of parental relationship and parental guidance on academic performance, while also testing learning motivation as a mediating variable, within the specific context of public medical universities in Henan Province. The significance of this research lies in three key areas.

From a theoretical perspective, the study integrates Self-Determination Theory and Bronfenbrenner's Ecological Systems Theory to advance understanding of how proximal family relationships interact with students' psychological needs in shaping academic outcomes. This theoretical integration is particularly relevant in a collectivist, high-stakes education system, where family influence plays a pivotal role.

From an empirical standpoint, the research provides province-specific evidence from Henan, an under-researched yet crucial region for China's medical workforce. By focusing on this context, the study addresses the paucity of data on how family factors operate in resource-limited educational environments, thereby enriching the broader literature on academic performance determinants.

Practically, the findings offer valuable insights for policymakers, university administrators, and educators in designing targeted strategies to foster autonomy-supportive parental engagement. Moreover, the study's results can guide the development of motivational interventions aimed at enhancing both resilience and academic performance among medical undergraduates, ultimately contributing to the cultivation of a competent and well-prepared medical workforce.

2.0 RESEARCH BACKGROUND

Academic performance in medical education is the outcome of a complex interplay between cognitive ability, emotional resilience, and environmental support. Medical students are expected to integrate advanced theoretical knowledge with practical clinical skills, often under conditions of sustained academic pressure and high societal expectations (Tang et al., 2021). In China, these expectations are reinforced by a strongly exam-oriented system, where standardized assessments and competitive rankings dominate evaluations, despite ongoing national reforms aimed at more holistic approaches (Geng, 2022). This exam-centric culture, while driving measurable achievement, has also been linked to reduced intrinsic motivation, increased stress levels, and the prioritisation of short-term performance over deeper learning (Lin et al., 2023). Henan Province, China's third most populous region, reflects these national patterns while facing additional constraints related to uneven distribution of higher education resources across urban and rural areas. Public medical universities such as Zhengzhou University and Henan University of Chinese Medicine draw students from diverse socio-economic backgrounds, many of whom confront barriers in accessing academic support services. These conditions create disparities in performance and make it essential to examine the specific factors—both personal and contextual—that shape academic success in Henan's medical education environment.

One of the most critical psychological determinants of academic success is learning motivation, which refers to the internal drive that initiates, directs, and sustains academic behaviour (Ma & Hu, 2025). Motivation influences not only how persistently students engage with their studies, but also the quality of their engagement, such as whether they employ deep learning strategies or rely on rote memorisation. In the demanding environment of medical education, motivation serves as a buffer against burnout and a driver of resilience (Messerer et al., 2023). However, in Chinese universities, intrinsic motivation is often overshadowed by extrinsic pressures, including the pursuit of high grades, scholarships, and parental approval (Geng, 2022). According to Self-Determination Theory, optimal motivation occurs when students' needs for autonomy, competence, and relatedness are

met (Ryan & Deci, 2024). Yet, evidence suggests that these needs are frequently unmet in the context of Henan's public medical universities, leading to motivational imbalances that can undermine long-term academic engagement.

Within this educational and cultural setting, parental involvement remains a significant yet complex influence on student outcomes, even at the university level. In collectivist cultures such as China's, family expectations and support often extend beyond secondary education and continue to shape students' emotional and academic lives (Chen & Hesketh, 2021). Parental involvement can take different forms, of which two are particularly salient: parental relationship, referring to the quality of emotional bonding, trust, and communication; and parental guidance, encompassing academic mentoring, value transmission, and life planning support. A warm and supportive parental relationship can foster students' confidence, emotional security, and willingness to persist through academic challenges (Lu, 2023; Fathi et al., 2024). Likewise, constructive parental guidance can scaffold goal-setting and disciplined study habits, provided it is autonomy-supportive rather than controlling (Marlina et al., 2023; Mammadov & Schroeder, 2023).

In Henan's public medical universities, students often experience both the benefits and drawbacks of parental involvement. Emotional support can enhance motivation and resilience, yet overly directive academic oversight may reduce autonomy and increase psychological stress (Lin & Zhan, 2024; Guo et al., 2025). While existing literature recognises the role of parental involvement in student performance, most studies treat it as a single construct, overlooking the potentially distinct effects of emotional and supervisory components. Furthermore, the mediating role of learning motivation in linking these parental factors to academic performance remains underexplored in Chinese medical education, particularly in under-resourced provincial contexts. Addressing this gap can provide more precise insights into how family dynamics influence not only students' motivation but also their eventual academic outcomes in high-pressure training environments.

3.0 LITERATURE REVIEW

Academic Performance in Medical Education

Academic performance refers to the extent to which students achieve the intended learning outcomes of their educational programs, commonly assessed through examinations, coursework, and practical evaluations (Wu et al., 2020). In medical education, performance includes not only theoretical knowledge but also clinical competence, critical thinking, and professional readiness (Mirmoghtadaie et al., 2023; Tătaru, 2024). In China, an exam-oriented culture persists, with high-stakes testing strongly shaping study behaviours despite ongoing reforms toward more holistic evaluation (Lin et al., 2023; Geng, 2022). Research shows that academic performance is influenced by cognitive abilities, learning strategies, institutional support, socio-economic background, and psychological factors, particularly learning motivation (Li et al., 2022). In public medical universities in Henan Province, students often experience competitive academic environments, heavy workloads, and strong family expectations, making it critical to investigate both personal and contextual factors that sustain performance.

Learning Motivation and Academic Performance

Learning motivation is the internal force that initiates, directs, and sustains students' engagement with learning tasks (Skinner & Raine, 2022). It is commonly divided into intrinsic motivation—driven by interest, enjoyment, or personal value—and extrinsic motivation—driven by external rewards or pressures (Ryan, 2022). Self-Determination Theory (Ryan & Deci, 2000) posits that intrinsic motivation is fostered when learners' needs for autonomy, competence, and relatedness are met. In medical education, motivation is a critical determinant of persistence, deep learning strategies, and resilience in the face of academic challenges (Messerer et al., 2023). Studies show that intrinsic motivation correlates positively with higher-order thinking and long-term retention, while extrinsic motivation often leads to short-term gains but weaker conceptual understanding (Wu et al., 2020; Rafiee-Vardanjani & Arsalani, 2025). Motivation also acts as a mediator linking various external influences—such as teaching quality, peer support, and parental involvement—to academic outcomes (Mahmoudi & Najafi, 2024; Torkani et al., 2025). These findings suggest that improving learning motivation can be a direct pathway to enhancing academic performance.

Parental Involvement: Relationship and Guidance

Parental involvement reflects the extent to which parents engage in their children's educational experiences, providing both emotional and instrumental support (Lerner et al., 2022). In collectivist societies like China, family expectations and involvement often extend into university life, continuing to shape academic behaviours and attitudes (Chen et al., 2023). This study distinguishes between parental relationship, which captures emotional bonding, trust, and communication, and parental guidance, which encompasses academic advice, mentoring, and life planning support. High-quality parental relationships are linked to greater emotional stability and self-esteem, while constructive parental guidance helps students develop disciplined study habits and clear learning goals (Fathi et al., 2024; Mammadov & Schroeder, 2023). However, over-controlling guidance may undermine autonomy and intrinsic motivation, potentially hindering long-term learning engagement (Rafiee-Vardanjani et al., 2025).

Parental Involvement and Learning Motivation

Parental involvement has a significant influence on students' learning motivation. Supportive parental relationships, characterised by warmth, open communication, and trust, satisfy students' psychological need for relatedness, fostering

intrinsic motivation (Gonzalez-DeHass et al., 2005). Students who perceive strong emotional backing from their parents tend to internalise learning goals and persist in the face of difficulties. Similarly, autonomy-supportive parental guidance can enhance students' sense of competence and encourage self-regulation, leading to higher intrinsic motivation (Marlina et al., 2023). In contrast, directive or controlling guidance may prioritise short-term compliance over long-term engagement, pushing students toward extrinsic rather than intrinsic motivation (Deci & Ryan, 2000). Evidence from higher and medical education confirms that the impact of parental involvement on motivation is contingent on both its nature and delivery (Fathi et al., 2024; Mammadov & Schroeder, 2023).

Parental Involvement and Academic Performance

Both parental relationship and parental guidance can exert direct effects on academic performance. Positive parental relationships promote emotional well-being, resilience, and confidence, enabling students to engage more effectively in academic tasks (Fathi et al., 2024; Yang et al., 2023). Effective parental guidance can reinforce goal setting, time management, and disciplined learning behaviours, all of which are associated with higher academic achievement (Mammadov & Schroeder, 2023). However, excessive control or unrealistic expectations can create stress, reduce autonomy, and impair performance (Martinek et al., 2022). While studies in primary and secondary education have widely examined these effects, less is known about their operation among university-level medical students in provincial Chinese contexts, where parental influence remains culturally significant.

Mediating Role of Learning Motivation

Learning motivation may serve as the mechanism through which parental relationship and parental guidance influence academic performance. Supportive parental relationships can enhance motivation by meeting students' needs for emotional connection and validation, which then promotes better academic outcomes (Gonzalez-DeHass et al., 2005). Similarly, autonomy-supportive parental guidance can build competence and self-regulatory capacity, boost intrinsic motivation and thereby improve performance (Marlina et al., 2023). Empirical studies in diverse educational contexts support the mediating role of motivation in family–achievement relationships (Mahmoudi & Najafi, 2024; Torkani et al., 2025). However, research examining this mediation specifically among Chinese medical university students remains scarce, highlighting a key gap this study seeks to address.

Underpinning Theories

This study draws upon Self-Determination Theory (SDT) and Bronfenbrenner's Ecological Systems Theory (EST) to explain the mechanisms through which parental relationship and parental guidance influence academic performance, both directly and through learning motivation.

Self-Determination Theory (SDT), developed by Deci and Ryan (1985, 2000), posits that human motivation exists along a continuum from amotivation, through extrinsic motivation, to intrinsic motivation. The quality of motivation depends on the satisfaction of three innate psychological needs: autonomy (feeling a sense of choice and control over one's actions), competence (feeling effective in one's activities), and relatedness (feeling connected to and cared for by others). When these needs are fulfilled, individuals are more likely to engage in learning for its inherent satisfaction (intrinsic motivation), which is associated with deeper learning and better performance outcomes.

Parental involvement can influence these needs in powerful ways. Parental relationship—through warmth, trust, and open communication—primarily addresses the need for relatedness, creating a secure emotional base that encourages exploration and engagement. Parental guidance, when autonomy-supportive, nurtures competence by providing constructive feedback, scaffolding learning, and helping students develop self-regulation skills. Conversely, controlling or overly directive guidance can thwart autonomy, shifting students toward extrinsic motivation and potentially undermining long-term engagement. Thus, SDT provides a strong theoretical rationale for the proposed mediating role of learning motivation between parental factors and academic performance.

Bronfenbrenner's Ecological Systems Theory (EST) (1979) offers a broader developmental framework, emphasising that human development occurs within nested environmental systems. The microsystem—the immediate environment in which an individual interacts—includes the family, peers, and educational institutions. Parental relationship and parental guidance operate within this microsystem, directly influencing the learner's experiences, attitudes, and behaviours. EST also recognises the interconnectedness of systems; for example, interactions between the family (microsystem) and the university (another microsystem) can influence students' motivation and performance through shared expectations and feedback loops.

Integrating SDT and EST allows this study to capture both the psychological processes (how motivation is shaped by need satisfaction) and the contextual influences (how family as a microsystem impacts development) underlying the relationship between parental involvement and academic performance. SDT explains the motivational mechanism, while EST situates it within the broader social and cultural environment of Chinese medical students, where family expectations remain a significant force even in adulthood. This dual-theory foundation provides a comprehensive explanation of the direct and indirect pathways in the conceptual framework.

Hypotheses

H1: Parental relationship has a positive effect on learning motivation among public medical university students in Henan Province, China.

H2: Parental guidance has a positive effect on learning motivation among public medical university students in Henan Province, China.
H3: Parental relationship has a positive effect on academic performance among public medical university students in Henan Province, China.
H4: Parental guidance has a positive effect on academic performance among public medical university students in Henan Province, China.
H5: Learning motivation has a positive effect on academic performance among public medical university students in Henan Province, China.
H6: Learning motivation mediates the relationship between parental relationship and academic performance.
H7: Learning motivation mediates the relationship between parental guidance and academic performance.

4.0 CONCEPTUAL FRAMEWORK

The conceptual framework for this study is constructed to examine the relationships between parental relationship, parental guidance, learning motivation, and academic performance among public medical university students in Henan Province, China. It integrates the perspectives of Self-Determination Theory (SDT) and Bronfenbrenner's Ecological Systems Theory (EST) to explain both the psychological and contextual mechanisms underlying these relationships.
In this framework, parental relationship and parental guidance are treated as distinct but related forms of parental involvement. Parental relationship captures the emotional dimension—such as warmth, trust, and quality of communication—while parental guidance refers to the provision of academic and life advice, goal-setting support, and value transmission. Both are posited to have direct effects on students' academic performance and indirect effects mediated by learning motivation.
Learning motivation is positioned as a central mediator in the model. Drawing on SDT, it is expected that supportive parental relationships fulfil students' need for relatedness, and autonomy-supportive parental guidance nurtures competence and autonomy—both of which enhance intrinsic motivation. Higher learning motivation, in turn, leads to improved academic performance, as supported by previous empirical studies in higher education and medical school contexts.
From the EST perspective, parental relationship and parental guidance are microsystem-level influences that directly shape students' developmental and learning processes. The strong family orientation in Chinese culture means that these influences remain significant even in young adulthood, especially in academically demanding environments such as medical universities.
The proposed framework therefore includes:

- Direct effects from parental relationship and parental guidance to both learning motivation and academic performance.
- A direct effect from learning motivation to academic performance.
- Mediating effects of learning motivation in the relationships between each parental factor and academic performance.

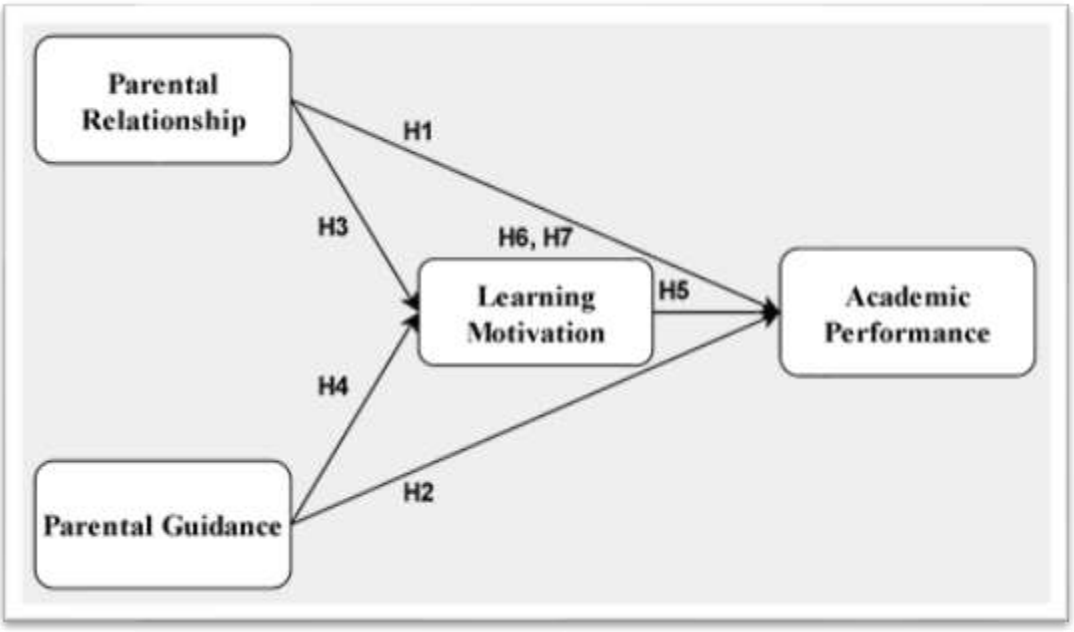

Figure 1. Conceptual Framework
Source. Author owns work

5.0 RESEARCH METHODOLOGY

Research Design

This study adopted a quantitative, cross-sectional survey design to examine the direct and indirect effects of parental relationship and parental guidance on academic performance, mediated by learning motivation, among public medical university students in Henan Province, China. A quantitative approach was chosen for its ability to test theoretically grounded hypotheses through statistical modelling, while the cross-sectional nature enabled the collection of a sufficiently large dataset within practical and temporal constraints. Although longitudinal designs could capture changes over time, the cross-sectional approach was deemed appropriate given the study's primary focus on relational patterns rather than causal change trajectories.

Population and Sampling

The target population comprised undergraduate students enrolled in public medical universities in Henan Province. These institutions represent a concentrated hub of medical education in the province, ensuring a homogeneous academic environment while still capturing variations in parental involvement and motivational levels.

A stratified random sampling technique was applied to ensure proportional representation of respondents across different academic years and disciplines, thereby reducing sampling bias. Using Krejcie and Morgan's (1970) sample size table, the minimum required sample for a population exceeding 10,000 was calculated at 384. To offset the potential impact of non-responses or unusable questionnaires, 450 survey forms were distributed. This sample size is also adequate for Partial Least Squares Structural Equation Modelling (PLS-SEM), which performs reliably with small-to-moderate samples, provided the model meets the minimum paths-to-sample ratio.

Research Instrument

The research instrument was a structured, self-administered questionnaire divided into five sections:

1. **Demographic Information** – including gender, age, year of study, and relevant background variables to enable descriptive profiling and subgroup comparisons.
2. **Parental Relationship** – measured using five items adapted from the Child–Parent Relationship Scale (CPRS) developed by Pianta (1992). This scale is widely validated in educational and psychological research and measures the emotional quality and communication effectiveness between parents and students. Items cover emotional support, trust, comfort in discussing academic matters, and perceived mutual understanding. Responses were rated on a five-point Likert scale (1 = Strongly Disagree, 5 = Strongly Agree), with higher scores indicating a more supportive relationship.
3. **Parental Guidance** – measured using three items adapted from Hasan et al. (2023). The items assess the extent to which parents provide constructive academic and personal guidance, actively monitor progress, and foster a supportive home learning environment. Higher scores on the five-point Likert scale indicate stronger parental guidance.
4. **Learning Motivation** – measured using four items adapted from Shao and Kang (2022). This instrument evaluates both intrinsic and extrinsic motivational tendencies in medical studies, including enjoyment of the subject matter, satisfaction from learning, persistence in solving academic problems, and motivation to seek additional resources. Higher Likert-scale scores indicate stronger learning motivation.
5. **Academic Performance** – measured using five items adapted from Cai et al. (2024). These items assess students perceived academic achievements, application of knowledge, performance in theoretical and practical assessments, and ability to retain and apply knowledge. Self-report was used due to the difficulty of obtaining standardised GPA data across universities, though this introduces the potential for common method bias.

All original items were retained from their respective validated instruments, but the response format was standardised to a five-point Likert scale for consistency across constructs. The questionnaire was prepared in English, translated into Chinese, and back-to-back translation to ensure semantic equivalence and cultural appropriateness.

Validity and Reliability

Content validity was ensured through expert review by three academics specialising in educational psychology and higher education, who evaluated the questionnaire for clarity, relevance, and cultural fit. A pilot study was conducted with 50 medical students from a non-sampled public medical university in Henan Province to test comprehensibility and to estimate preliminary reliability indices. The pilot test results showed Cronbach's alpha values exceeding the 0.70 threshold for all constructs, indicating satisfactory internal consistency. Minor wording refinements were made to improve clarity and cultural alignment without altering the constructs' core meaning.

Data Collection Procedure

Data collection took place over a six-week period through on-site distribution, with the cooperation of faculty coordinators to facilitate access to targeted classrooms. Participation was voluntary, with assurances of anonymity and confidentiality provided in a written consent statement. Completed questionnaires were checked for missing data; incomplete responses exceeding 10% missing items on any construct were excluded from the final dataset.

Data Analysis

Data analysis was performed using Partial Least Squares Structural Equation Modelling (PLS-SEM) in SmartPLS 4.0, supported by SPSS 26.0 for descriptive statistics. PLS-SEM was selected due to its suitability for theory development, its robustness with smaller sample sizes, and its ability to model complex relationships including mediation effects.

The analysis followed a two-stage process:

1. **Measurement Model Assessment** – involving checks for indicator reliability, internal consistency (Cronbach's alpha and composite reliability), convergent validity (Average Variance Extracted), and discriminant validity (Fornell–Larcker criterion and HTMT ratio).
2. **Structural Model Assessment** – testing the significance of hypothesised paths and mediation effects using a bootstrapping procedure with 5,000 resamples. Effect sizes (f^2) and predictive relevance (Q^2) were also assessed to gauge model robustness.

This methodological approach ensures a rigorous test of the research hypotheses while addressing both measurement quality and structural validity.

6.0 ANALYSIS AND RESULTS

Demographic Information

A total of 517 valid responses were obtained from public medical university students in Henan Province, China. Table 1 presents the demographic profile of the respondents.

Gender distribution was relatively balanced, with a slightly higher proportion of females (52.4%) compared to males (46.6%). This aligns with national statistics indicating that female enrolment in medical and health-related programmes in China tends to marginally exceed male enrolment, particularly in clinical medicine and nursing-related majors.

In terms of age, the majority of respondents fell within the 18–21 age range, with 31.7% aged 18–19 and 38.7% aged 20–21. Students aged 22–23 accounted for 21.5%, while those aged 24–25 represented only 8.1%. No respondents reported being aged 26 or above, reflecting the typical age profile of undergraduate medical students who enter directly after secondary school and progress through continuous years of study.

The sample was drawn from two major public medical institutions: Henan University of Chinese Medicine (52.4%) and Zhengzhou University (47.6%). This distribution ensures representation from both Western and Chinese medical education traditions, which may differ in curriculum structure, parental engagement patterns, and student motivation factors.

Regarding grade level, the largest group of respondents were in their fourth year (26.5%), followed by third year (20.9%) and second year (20.3%) students. First-year students constituted 17.0% of the sample, while fifth-year students represented 15.3%. This spread allows for comparative insights into how parental relationship, guidance, and motivation may shift across the progression of medical education, particularly during the transition from pre-clinical to clinical training years.

In terms of self-reported academic performance, 27.1% rated their performance as Excellent, 58.6% as Average, and 14.3% as Below Average. The predominance of students rating themselves as average is consistent with prior findings in self-assessment research, where modest self-perception is common among academically competitive cohorts such as medical students.

The demographic distribution of this sample suggests it is broadly representative of the target population and provides a sound basis for subsequent multivariate analyses of the hypothesised relationships between parental factors, learning motivation, and academic performance.

Table 1. Demographic Profile of Respondents

Items	Frequency	Percent	Cumulative Percent
Gender			
Male	241	46.6	46.6
Female	276	52.4	100.0
Age			
18-19	164	31.7	31.7
20-21	200	38.7	70.4
22-23	111	21.5	91.9
24-25	42	8.1	100.0
>=26	0	0	100.0
Universities			
Zhengzhou University	246	47.6	47.6
Henan University of Chinese Medicine	271	52.4	100.0
Grade			
First Year	88	17.0	17.0

Second Year	105	20.3	337.3
Third Year	108	20.9	58.2
Fourth Year	137	26.5	84.7
Fifth Year	79	15.3	100.0
Academic Performance			
Excellent	140	27.1	27.1
Average	303	58.6	85.7
Below Average	74	14.3	100.0

Measurement Model Assessment

Table 2 presents the results of the reliability and convergent validity tests for all four constructs. The Cronbach's alpha values ranged from 0.813 to 0.883, exceeding the recommended threshold of 0.70 (Nunnally & Bernstein, 1994), thus indicating satisfactory internal consistency. Similarly, the composite reliability (ρc) values ranged from 0.889 to 0.914, surpassing the acceptable minimum of 0.70 (Hair et al., 2019), which further supports the reliability of the measurement scales. The rho_A values, which provide a more precise estimation of construct reliability (Dijkstra & Henseler, 2015), also fell within acceptable ranges (0.813–0.885), confirming consistency across items within each construct.

In terms of convergent validity, all constructs recorded Average Variance Extracted (AVE) values above the recommended 0.50 threshold (Fornell & Larcker, 1981), ranging from 0.681 to 0.727. These results demonstrate that each construct explains more than 68% of the variance in its respective indicators, thereby confirming strong convergent validity.

Overall, the measurement model exhibited robust reliability and convergent validity, providing a sound foundation for subsequent structural model testing.

Table 2. Constructs Reliability and Validity Results

	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)
Academic Performance	0.883	0.885	0.914	0.681
Learning Motivation	0.871	0.871	0.912	0.721
Parental Guidance	0.813	0.813	0.889	0.727
Parental Relationship	0.883	0.883	0.914	0.681

Path Coefficient

The direct path analysis results are presented in Table 3. Parental Guidance was found to have a significant positive effect on Learning Motivation ($\beta = 0.152$, $t = 3.526$, $p < 0.001$), suggesting that explicit academic and personal development support from parents plays a pivotal role in enhancing students' intrinsic and extrinsic motivation. Similarly, Parental Relationship demonstrated a significant positive influence on Learning Motivation ($\beta = 0.101$, $t = 2.323$, $p = 0.020$), indicating that emotional closeness, trust, and supportive communication with parents foster greater engagement in learning.

In terms of academic outcomes, Parental Guidance showed a small but significant positive impact on Academic Performance ($\beta = 0.023$, $t = 2.557$, $p = 0.011$), whereas the direct effect of Parental Relationship on Academic Performance was positive but statistically insignificant at the 5% level ($\beta = 0.016$, $t = 1.915$, $p = 0.056$). This implies that while emotional bonds with parents contribute indirectly to achievement, structured guidance has a more immediate and measurable effect on performance.

Finally, Learning Motivation significantly predicted Academic Performance ($\beta = 0.154$, $t = 3.585$, $p < 0.001$), confirming its central role as a key driver of academic success among medical university students in Henan Province.

Table 3. Path Coefficient Results

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values
Parental Guidance -> Learning Motivation	0.152	0.153	0.043	3.526	0.000

Parental Relationship -> Learning Motivation	0.101	0.101	0.044	2.323	0.020
Parental Guidance -> Academic Performance	0.023	0.023	0.009	2.557	0.011
Parental Relationship -> Academic Performance	0.016	0.015	0.008	1.915	0.056
Learning Motivation -> Academic Performance	0.154	0.153	0.043	3.585	0.000

Note: ***p<.001

Mediation Analysis

The mediation analysis, as shown in Table 4, assessed the indirect effects of parental factors on academic performance through learning motivation. The results revealed that Learning Motivation significantly mediated the relationship between Parental Guidance and Academic Performance (β = 0.023, t = 2.557, p = 0.011). This indicates that the positive influence of parental guidance on students' academic outcomes operates both directly and indirectly via enhanced learning motivation, constituting partial mediation.

For Parental Relationship, the mediation pathway through Learning Motivation was positive but statistically non-significant at the 5% level (β = 0.016, t = 1.915, p = 0.056). This suggests that although emotional support and trust from parents tend to promote motivation, the mediated impact on academic performance was not strong enough to reach statistical significance.

Overall, these findings reinforce the theoretical model in which learning motivation acts as a critical psychological mechanism linking parental involvement—particularly guidance—to improved academic achievement in the context of Chinese medical education.

Table 4. Specific Indirect Results

	Original sample (O)	**Sample mean (M)**	**Standard deviation (STDEV)**	**T statistics (|O/STDEV|)**	**P values**
Parental Relationship -> Learning Motivation -> Academic Performance	0.016	0.015	0.008	1.915	0.056
Parental Guidance -> Learning Motivation -> Academic Performance	0.023	0.023	0.009	2.557	0.011

Note: ***p<.001

Hypotheses Summary

Table 5 presents the summary of hypotheses testing results derived from the structural model analysis. The statistical significance was evaluated using bootstrapping procedures with 5,000 resamples, and hypotheses were accepted or rejected based on a 95% confidence level (p < 0.05).

Table 5. Summary of Hypotheses Testing Results

Hypothesis	**Path**	**β**	**t-value**	**p-value**	**Decision**
H1	Parental Guidance → Learning Motivation	0.152	3.526	0.000	Supported
H2	Parental Relationship → Learning Motivation	0.101	2.323	0.020	Supported
H3	Parental Guidance → Academic Performance	0.023	2.557	0.011	Supported
H4	Parental Relationship → Academic Performance	0.016	1.915	0.056	Not Supported
H5	Learning Motivation → Academic Performance	0.154	3.585	0.000	Supported
H6	Parental Guidance → Learning Motivation → Academic Performance	0.023	2.557	0.011	Supported
H7	Parental Relationship → Learning Motivation → Academic Performance	0.016	1.915	0.056	Not Supported

The results indicate that parental guidance significantly influences both learning motivation and academic performance directly, and also indirectly via motivation (partial mediation). Parental relationship, while positively associated with learning motivation, did not exert a statistically significant direct or mediated effect on academic performance. Learning motivation emerged as a robust predictor of academic success, highlighting its importance as a psychological mechanism through which parental involvement can translate into improved outcomes.

7.0 DISCUSSION OF RESEARCH FINDINGS

This study investigated the relationships between parental relationship, parental guidance, learning motivation, and academic performance among public medical university students in Henan Province, China, with learning motivation examined as a mediating variable. The discussion integrates the empirical findings with existing literature and theoretical perspectives, offering insights into the mechanisms through which parental factors influence students' motivation and performance.

The results revealed that parental guidance significantly predicts students' learning motivation ($\beta = 0.152$, $p < 0.001$), supporting H1. This finding aligns with previous studies (Hasan et al., 2023; Fan & Chen, 2021) which emphasize that proactive parental involvement—through academic advice, progress monitoring, and the creation of a conducive home learning environment—fosters students' motivation. From the perspective of Self-Determination Theory (SDT), such guidance enhances students perceived competence and relatedness, stimulating both intrinsic and extrinsic motivation. Similarly, H2 was supported, with parental relationship showing a significant positive effect on learning motivation ($\beta = 0.101$, $p < 0.05$). This outcome is consistent with the work of Pianta (1992) and Li et al. (2020), which highlights that emotionally supportive and communicative parent–child relationships provide psychological security, encouraging deeper academic engagement. Within the Social Cognitive Theory (SCT) framework, such relationships strengthen self-efficacy beliefs, further driving students' willingness to invest effort in their studies.

Parental guidance was also found to have a significant direct influence on academic performance ($\beta = 0.023$, $p < 0.05$), supporting H3. This aligns with Jeynes (2016), who reported that actively guiding parents contribute to improved student performance through better time management, effective learning strategies, and sustained academic engagement. In the context of medical education, where academic demands are high, parental guidance appears to play a tangible role in students' ability to meet performance expectations.

In contrast, H4 was not supported, as the direct effect of parental relationship on academic performance was statistically insignificant ($\beta = 0.016$, $p > 0.05$). This suggests that while strong emotional bonds with parents can nurture motivation, they may not directly translate into measurable academic outcomes without complementary academic guidance or targeted motivational reinforcement. Similar conclusions were drawn by Hill and Tyson (2009), who observed that relational warmth alone may not improve grades unless accompanied by academic-focused support.

The study also found a strong and significant effect of learning motivation on academic performance ($\beta = 0.154$, $p < 0.001$), supporting H5. This result confirms prior findings (Shao & Kang, 2022; Deci & Ryan, 2017) that motivated students tend to invest more effort, adopt deeper learning strategies, and persist in the face of challenges, ultimately achieving higher academic success. This reinforces the central role of motivation in the Stimulus–Organism–Response (SOR) model, where parental factors (stimuli) influence performance outcomes (response) through the mediating role of motivation (organism).

The mediation analysis further revealed that learning motivation significantly mediated the relationship between parental guidance and academic performance (H6, $\beta = 0.023$, $p < 0.05$), indicating partial mediation. This suggests that parental guidance affects performance both directly and indirectly by boosting students' motivation. However, the mediation pathway from parental relationship to academic performance (H7) was not statistically significant, indicating that emotional closeness, while valuable for motivation, does not necessarily improve academic outcomes without academic-oriented parental engagement.

Overall, these findings highlight the distinct yet interconnected roles of parental guidance and parental relationship in influencing student success. While both factors positively impact learning motivation, only parental guidance demonstrates a direct effect on academic performance, with motivation serving as a critical mediating mechanism. These results validate the combined utility of SDT, SCT, and SOR frameworks in explaining how parental factors shape learning motivation and performance within the specific cultural and educational context of Chinese medical universities.

8.0 RESEARCH LIMITATION AND RECOMMENDATION

This study offers meaningful insights into how parental relationship and parental guidance influence learning motivation and academic performance among medical students in Henan Province. However, several limitations should be noted. First, its cross-sectional design limits causal interpretation; future longitudinal studies could capture changes over time and strengthen causal claims. Second, the sample was restricted to two public medical universities, which may limit generalizability to other regions, disciplines, or institutional contexts. Third, reliance on self-reported measures may introduce bias; incorporating objective performance data and parental perspectives could improve accuracy.

Future research should examine a broader range of parental influence variables, such as expectations, role modelling, and financial support, to provide a more comprehensive understanding. Expanding the study to diverse institutional and cultural settings would also enhance external validity. Practically, universities should encourage structured parental engagement that balances emotional support with academic guidance and implement motivation-focused interventions in collaboration with parents to foster students' long-term academic success.

9.0 CONCLUSION

This study examined the influence of parental relationship and parental guidance on academic performance among public medical university students in Henan Province, with learning motivation tested as a mediating variable. The findings highlight that while both parental relationship and parental guidance enhance learning motivation, only parental guidance exerts a direct effect on academic performance. Learning motivation emerged as a significant predictor of performance and a partial mediator between parental guidance and academic outcomes, underscoring its central role in the learning process. These results contribute to the understanding of how parental factors shape student success in the context of Chinese higher education, integrating insights from Self-Determination Theory, Social Cognitive Theory, and the Stimulus–Organism–Response framework. Practically, the findings suggest that fostering strong parental guidance and motivation-supportive environments can enhance students' academic achievements, particularly in demanding disciplines such as medicine. Future research should extend this model to other contexts, adopt longitudinal designs, and incorporate additional parental influence variables to build a more comprehensive understanding of the parent–student–performance dynamic.

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