The Impact of Medical Education Quality on Career Adaptability for International Students in China: The Mediating Role of Proactive Career Planning Behavior

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Abstract

Background: The quality of medical education plays a significant role in shaping the career outcomes of international students. As they navigate the challenges of their studies and career paths in a foreign country, understanding the elements that influence their career adaptability is essential. Objective: This study aims to examine the impact of medical education quality on career adaptability among international students in China and to emphasize the mediating role of proactive career planning behavior. It also investigates challenges related to cultural adjustment. Methodology: A quantitative technique is employed in a cross-sectional survey of international medical students in China. Information was collected from 575 valid responses through structured questionnaires. The research utilizes regression analysis and Structural Equation Modeling (SEM) to assess the relationships between medical education quality, career adaptability, proactive career planning behavior, and cultural adjustment challenges. Result: The evaluation revealed that medical education quality positively influences career adaptability ($p < 0.001$, $\beta = 0.45$). Proactive career planning behavior was found to positively influence career adaptability ($p < 0.001$, $\beta = 0.38$). Medical education quality positively influences proactive career planning behavior ($p < 0.001$, $\beta = 0.50$), and proactive career planning behavior mediated the connection between medical education quality and career adaptability ($p = 0.013$, $\beta = 0.20$). Cultural adjustment challenges moderated the relationship between medical education quality and career adaptability, with a significant interaction effect ($p = 0.032$, $\beta = -0.15$). Conclusion: The research emphasizes the significance of high-quality medical education in promoting career adaptability among international students, highlighting proactive career

planning and examining cultural adjustment challenges for optimal career outcomes. These insights can inform educational practices and support services for international medical students, aiming to enhance their career readiness and adaptability in a global context.

Keywords: Medical Education Quality, Proactive Career Planning Behavior, International Students, Career Adaptability.

China is becoming a more popular destination for international students pursuing medical education abroad, a trend attributed to the globalization of higher education (Mok et al., 2022). A growing number of international students are attracted to the country every year, drawn by its sophisticated medical facilities, cultural diversity, and recognized medical education system. The opportunity to receive top-tier education, access modern facilities and medical technology, and eventually secure promising careers in the highly competitive international medical industry influences these students. However, migrating to study and live abroad presents numerous difficulties that might affect students' performance in educational institutions and their careers. In these circumstances, it is important that international students studying in China understand the factors that influence career adaptability, which is considered the capacity to navigate and effectively manage employment responsibilities, transitions, and obstacles (Jiang et al., 2020).

The contemporary global medical sector has placed a premium on career flexibility, as major characteristics of achievement include cross-cultural abilities, evolving healthcare systems, and swift advances in technology. Career adaptability for international medical students involves the capacity to effectively organize, supervise, and navigate the challenges of establishing a career in a highly dynamic and diversified environment (Kampermann et al., 2021). It goes beyond academic excellence alone. This flexibility is especially important for students who pursue careers abroad in the future; they must be open to lifelong education and career growth. Therefore, to ensure international medical students are equipped to meet the challenges of the global medical profession, it is imperative to enhance their career flexibility.

A key factor in promoting career adaptability is proactive career planning behavior. It entails making thoughtful decisions to ascertain professional objectives, recognize relevant experiences, and acquire the essential knowledge and abilities (Green et al., 2020). Proactive career planning for medical students studying in China includes conducting research, seeking mentoring, participating in internships, and keeping up with international medical trends. Engaging in such activities not only enhances students' preparedness for the workforce but also helps them adjust to new opportunities and challenges as they advance in their careers. Accordingly, students' overall career flexibility can be significantly affected by how actively they plan their careers (Palazzo et al., 2021).

Given the essential role of career adaptability and proactive career planning, it is important to examine how international medical students' experiences with China's medical faculties affect these aspects of their careers. Some investigators have explicitly highlighted the association between the quality of education international students receive and the outcomes of their career adaptation, although several have explored the overall experiences of these students in China. The research gap emphasizes the need for further examination of the connection between international learners' career adaptability and medical education quality, with an emphasis on the mediating outcome of proactive career planning behavior (Monteiro et al., 2020). The aim of this analysis is to examine the impact of quality medical education on the career

adaptability of international students in China, explore proactive career planning behavior, and offer insights for educational organizations and policymakers.

LITERATURE REVIEW

This section explores the concept of medical education quality, its impact on career adaptability, and the role of proactive career planning behavior in mediating these effects, with a focus on international students.

Jiang et al. (2022) examined the variables affecting the educational outcomes of international medical students studying in China. Key features were recognized through semi-structured interviews with forty students, including sociocultural challenges, language barriers, support networks, and the quality of education. Li et al. (2021) evaluated the quality of online education for international students from low- and middle-income countries (LMICs) in nursing and medicine in China during COVID-19. An examination involving 120 educators and 316 students showed that 36.5% of students were satisfied, with the pandemic intensity and educators' perceived distance from one another being significant factors.

Wu et al. (2020) addressed the relationship between learning engagement, motivation, and self-efficacy and medical students' academic achievement throughout China. After analyzing data from 1,930 students, it was shown that performance is greatly impacted by intrinsic motivation and learning engagement, with students at key universities performing better. Males performed worse but had higher degrees of intrinsic drive, according to gender differences. The lack of a direct correlation between self-efficacy and performance suggests the necessity for focused motivational interventions.

Hu et al. (2021) examined 610 Chinese college students' career adaptability, professional identities, proactive personalities, and perceived social support. The connection between career adaptability and proactive personality was found to be considerably mediated by perceived social support, with professional identity also playing a part. Enhancing one's professional identity via increased social support can promote job flexibility; hence, colleges might focus on developing programs and support structures that assist students in developing these abilities.

Zhang et al. (2023) used qualitative interviews with fifteen healthcare professionals from a Chinese teaching hospital to examine factors influencing career adaptability among recently graduated nurses and strategies to enhance it. Effective social support and self-adjustment are necessary for improving adaptation, and important characteristics such as personality, self-confidence, and career anxiety are recognized. Results focused on improvement initiatives to tackle these issues and reduce attrition. Due to its minimal data size and single-site focus, the research has limitations that could influence its generalizability.

Using surveys of 736 students in Guangdong Province, Zhu et al. (2023) examined first-year medical university students' responses to the COVID-19 epidemic. It indicated that, while most students transitioned rather well, there are significant variations in adaptation depending on their major, type of home, and whether they are sole children or intentionally enrolled in a medical institution. Despite heightened drive and typically strong levels of adaptability, 65.1% encountered pandemic-related disturbances. Medical institutions must enhance their adaptation management programs to better assist students who encounter these difficulties. The study's limitations include its dependence on self-reported data and its exclusive institution focus.

Valls et al. (2020) investigated the relationship between the proactive personality of university graduates and early career outcomes, namely perceived overqualification and career position. It makes use of paradigms of facilitated mediation where the moderators are core self-

evaluations and career planning. They indicated that a proactive personality has a moderating influence on perceived overqualification, with higher benefits shown when core self-evaluations are low. The shortcomings, which could limit its generalizability, involve the utilization of self-reported information and specific samples.

To comprehend how the societal environment affects professional aspirations and actions, Andresen et al. (2020) analyzed information gathered from 17,986 personnel across 27 nations. It concluded that while the psychological compound associated with social careers has an impact on financial success, proactive career activities have a favorable benefit. While recognizing possible self-report limitations and emphasizing nine cultural clusters, the analysis suggests career strategy should consider larger social effects beyond individual and organizational issues.

Jackson and Tomlinson (2020) investigated the association among career prospects, career proactivity, control, and planning of college students and their impressions of the career environment. Results from 433 students indicated that while optimistic views of the labor market increase career prospects and control, they also decrease proactive career actions. These elements have a favorable impact on career planning, emphasizing the necessity for colleges to enhance their approaches to career planning in consideration of difficult career prospects.

2.1 Development of Hypothesis

The formulation of the hypothesis is to determine whether proactive career planning behavior mediates the association between medical education quality and career adaptability among international students in China. This aids in determining and to the extent proactive career planning improves the effect of high-quality education on adaptability.The following hypotheses were expressed in this research:

Higher quality medical education positively influences career adaptability among international students by offering a comprehensive educational background. Relevant curricula safeguard that students become the greatest recent data possible, significant clinical exposure offers real-world experience, and effective teaching quality improves students' comprehension and abilities. By enhancing their confidence and skills, these features incorporate to qualify learners to navigate the diversity of possibilities and difficulties relationship with trailing careers in medicine.

Hypothesis 1: The medical education quality (MEQ) positively influences career adaptability (CA) between students from abroad.

Proactive career planning behavior positively influences career adaptability among international students by enabling important skills and techniques. Setting career goals assist learners in revolving their paths effectively, while networking activities and skill development make them for career environment requirements. Framing robust resumes and leading career environment analysis influence their willingness for career transitions, eventually increasing their capability to modify the professional environments.

Hypothesis 2: Proactive career planning behavior (PCPB) positively influences career adaptability (CA) among international students.

The MEQ positively influences PCPB between international students by providing a robust substance and inspiring students to be complications in career growth activities. High-quality education and associated curricula inspire learners to set career goals, while extensive clinical exposure and admission to resources influence them to actively monitor networking opportunities and skill development. These educational experiences perform a proactive strategy of career planning, as learners feel better equipped and more protected to reach their career difficulties effectively.

Hypothesis 3: The medical education quality(MEQ) positively influences proactive

career planning behavior (PCPB) between students from abroad.

As a significant technique through which education quality influences adaptation, PCPB mediates the connection between the MEQ and CA. A greater medical education offers students with the data and facilities they need to manage their careers proactively by emerging their skills, networking, and goal setting. This proactive attitude enhances their professional flexibility, making it easier for them to contract with problems and alterations in the employment environment. As a finding, students' PCPB plays a significant role in medical education and affects CA.

Hypothesis 4: Proactive career planning behavior (PCPB)mediates the relationship between the MEQand CA among international students.

Students' ability to make their educational experiences is obstructed by cultural adaptation difficulties, which efficiently moderates the connection between the MEQ and CA. The advantages of a superior medical education could be decreased for students from abroad who are experiencing severe difficulty with cultural transition. These difficulties could include social integration, language limitations, and difficulties adjusting to the new environment. Individuals who recognize less difficulty adapting to a new culture could be better, that able to convert their excellent education into more professional flexibility. Thus, the degree to which students face complications adjusting to a new culture has an effect on that adaptable a medical education is for future employment.

Hypothesis 5: Cultural adjustment challenges (CAC) moderate the relationship between MEQ and CA between students from abroad.

In addition, this research covers the methodology in section 3, involves data collection and the measurement scale, data analysis, and investigating the result in section 4 that obtained from the analysis. The final section 5 concludes the investigation.

RESEARCH METHODOLOGY

This section presents the research design, sampling procedures, and measurement techniques used to examine the relationship between MEQ, PCPB, CAC, and CA among international students.

3.1 Theoretical Framework

Based on the conceptual framework, literature review, and development of hypotheses, the theoretical framework of the research is depicted in Figure 1, it represents the hypothesized relationships among the variables. The independent variable, MEQ, is suggested to influence the dependent variable, CA, while PCPBhelps as a mediating variable that enables this relationship. Additionally, CAC is measured as a moderating variable that could impact the strength or direction of the relationship between MEQ and CA, examining the relationship between educational experiences and personal adaptation processes.

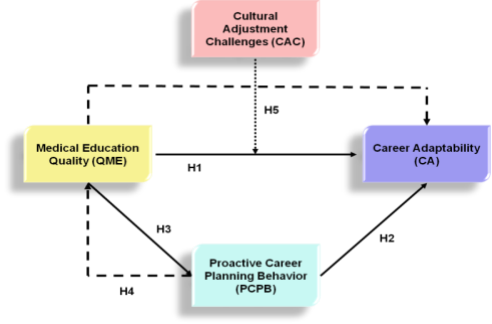

Figure 1: Theoretical research framework

3.2 Data Collection

Research utilizes a quantitative research design, employing an online survey to collect data from medical undergraduates in China. The approach of stratified random sampling was applied, and 12 questionnaires were distributed to 700 students from universities, based on university size, student distribution across academic years, and stratification by education level and population proportion. The

questionnaire was designed to evaluate several features of medical education quality. Out of 632 responses received, 57 were excluded due to high percentages of incomplete responses, resulting in 575 valid responses for further evaluation. This approach offers a robust sample to assess the medical education quality and focuses on data-driven perceptions for educational improvement and growth.

Research's participant demographics show that the cohort of medical undergraduates is different. With 52.2% of the students being male and 47.8% being female, the gender divide is almost similar. The majority of participants (52.2%) are between the ages of 21 and 23, with fewer respondents in other age categories. In terms of education, more people are in their first (31.3%) and second (26.1%) years of education than in their third (22.6%) or fourth (20.0%) years. Based on GPA statistics, a lesser proportion of students have Grade Point Averages (GPAs) below 3.0 (17.4%) or over 4.0 (4.3%). 43.5% of graduates have a GPA between 3.6 and 4.0, while 34.8% fall in the 3.0 to 3.5 range. Table 1 depicts the demographic features of the respondents.

Table 1: Demographic features of the respondents

Characteristics	Frequency	Percentage (%)
Gender		
Male	300	52.2
Female	275	47.8
Age		
18-20	150	26.1
21-23	300	52.2
24-26	100	17.4
27 and above	25	4.3
Year of Study		
1st Year	180	31.3
2nd Year	150	26.1
3rd Year	130	22.6
4th Year	115	20.0
GPA		
3.0 - 3.5	200	34.8
3.6 - 4.0	250	43.5
Below 3.0	100	17.4
Above 4.0	25	4.3

3.3 Measurement Scale

An instrument scale, ranging from 1 to 7, was employed as the assessment technique in this investigation. Numbers 1 and 7 indicate strongly disagreeing and strongly agreeing, respectively, with the response.

3.4 Data Analysis

The data were managed and analyzed using SPSS version 29.0.0.0 and Mplus 8. Themeasuring model data are MEQ (3 items), PCPB (3 items), CA (3 items), and CAC (3 items) of medical college students. The evaluation of the measuring model was conducted to confirm its validity and reliability. The constructs demonstrated satisfactory convergent validity and internal consistency, meeting established thresholds. Regression analysis is conducted to explore the direct relationships between the MEQ and CA, revealing that variations in MEQ predict changes in CA. Structural Equation Modeling (SEM) is utilized to test complex relationships and mediation effects, specifically assessing that PCPB mediates the relationship between MEQ and CA, and the CAC moderates this relationship. Model fit was evaluated using indices such as standardized root mean square residual (SRMR), Tucker-Lewis index (TLI), chi-square (χ^2), root mean square error of approximation (RMSEA), and comparative fit index (CFI). The significance level was set to 0.05 ($p<0.05$).

EXPERIMENTAL FINDINGS

This section summarizes the article's results, containingthe measurement model, measurement model fit, regression analysis, SEM analysis, and the mediation test performed.

4.1 Evaluation of Measurement Model

It examines the measuring model of every variable have satisfactory metrics. Table 2 depicts the result of reliability and validity.

Table 2: Result of reliability and validity

Variables	Item	α	Loading	AVE	CR
MEQ	MEQ 1	0.87	0.75	0.56	0.86
	MEQ 2		0.80		
	MEQ 3		0.78		
PCPB	PCPB 1	0.84	0.82	0.65	0.85
	PCPB 2		0.79		
	PCPB 3		0.76		
CA	CA 1	0.89	0.85	0.73	0.88
	CA 2		0.82		
	CA 3		0.80		
CAC	CAC 1	0.81	0.74	0.57	0.84
	CAC 2		0.78		
	CAC 3		0.76		

The findings of Average Variance Extracted (AVE) for MEQ (0.56), PCPB (0.65), CA (0.73), and CAC (0.57) are overhead the recommended threshold of 0.50, illustrating satisfactory convergent validity. The Composite Reliability (CR) index for PCPB (0.85), MEQ (0.86), CA (0.88), and CAC (0.84) represents good internal consistency, above 0.70 threshold. These outcomes support the reliability and validity of the builds in examining the pertinentfactors.

4.2 Result of Measurement Model Fit

The MEQ, PCPB, CA, and CAC variables measurement model fit indexesillustrate a greater degree of fit, meaning that the recommending models fit for everybuild are a good fit for the medical student's data. Table 3 shows the result of the measure model fit.

Table 3: Result of Measurement Model Fit

Construct	χ^2	df	χ^2/df Ratio	RMSEA	CFI	TLI	SRMR
MEQ	98.23	72	1.37	0.045	0.981	0.930	0.032
PCPB	89.45	65	1.37	0.047	0.975	0.920	0.034
CA	92.38	70	1.32	0.042	0.980	0.925	0.030
CAC	84.50	60	1.41	0.048	0.972	0.915	0.037

The approach for MEQ has a good fit, with SRMR at 0.032, RMSEA at 0.045, TLI at 0.930, and CFI at 0.981, all representinggood measurement model fit. Its chi-square (χ^2) is 98.23, and its chi-square/df ratio is 1.37. With RMSEA values ranging from 0.042 to 0.048, CFI from 0.972 to 0.980, TLI from 0.915 to 0.930, and SRMR from 0.030 to 0.037, PCPB, CA, and CAC also show strong fit. Together, these indices validate the robustness of the theoretical framework by confirming that the models for each construct appropriately capture the correlations observed in the data.

4.3Result of Regression Analysis

Important results for the suggested hypotheses are obtained from the analysis of regression. Table 4 shows the direct effect hypothesis.

Table 4: A direct effect hypothesis

Hypothesis	Direct Connection	R^2	F (df)	β	SE	t	p
H1	MEQ → CA	0.20	68.45 (1, 573)	0.45	0.054	8.33	<0.001
H2	PCPB → CA	0.14	49.63 (1, 573)	0.38	0.057	6.67	<0.001
H3	MEQ → PCPB	0.25	85.12 (1, 573)	0.50	0.059	8.47	<0.001

With an R2 = 0.20 (df = 1, 573), a substantial F value of 68.45 (df = 1), and a strong positive connection, the direct influence of MEQ on CA for Hypothesis 1 is found to explain 20% of the variance in CA. Based on Hypothesis 2, PCPB favorably affects CA, as realized by $R2 = 0.14$, and F = 49.63 (df = 1, 573). Based on Hypothesis 3's $R2 = 0.25$, and F = 85.12 (df = 1, 573), MEQ strongly impacts PCPB. Regression analysis findings validate strong direct effects for MEQ → CA, PCPB → CA, and MEQ → PCPB supported by significant p-values.

4.4 Result of Mediation Model

The study used a mediation model and bootstrap methods to investigate the mediating role of PCPB between MEQ and CA. Table 5 suggests by Hypothesis 4, that PCPB partially mediates the relationship between MEQ and CA, as demonstrated by $SE = 0.062$, and a significant t value of 3.23. The relationship between MEQ and CA is moderated by CAC, as demonstrated by Hypothesis 5's association impact with SE=0.072, and a significant t value of -2.08. This suggests that a higher CAC lessens the influence of MEQ on CA. Table 5 indicates that PCPB plays a mediating role in the relationship between CA and the MEQ of international Chinese medical students, which supports Hypothesis 4. The outcome represents that CAC plays a moderating role in the relationship between MEQand the CA, which supports Hypothesis 5. Specifically, MEQ has a positive effect on CA through the mediating effect of PCPB. Figure 2 shows the result of the mediation model.

Table 5: A mediation effect hypothesis

Hypothesis	Connection	R^2	F (df)	β	SE	t	p
H4	PCPB → MEQ → CA	0.04	17.36 (1, 573)	0.20	0.062	3.23	0.013
H5	CAC → MEQ → CA	0.02	9.42 (1, 573)	-0.15	0.072	-2.08	0.032

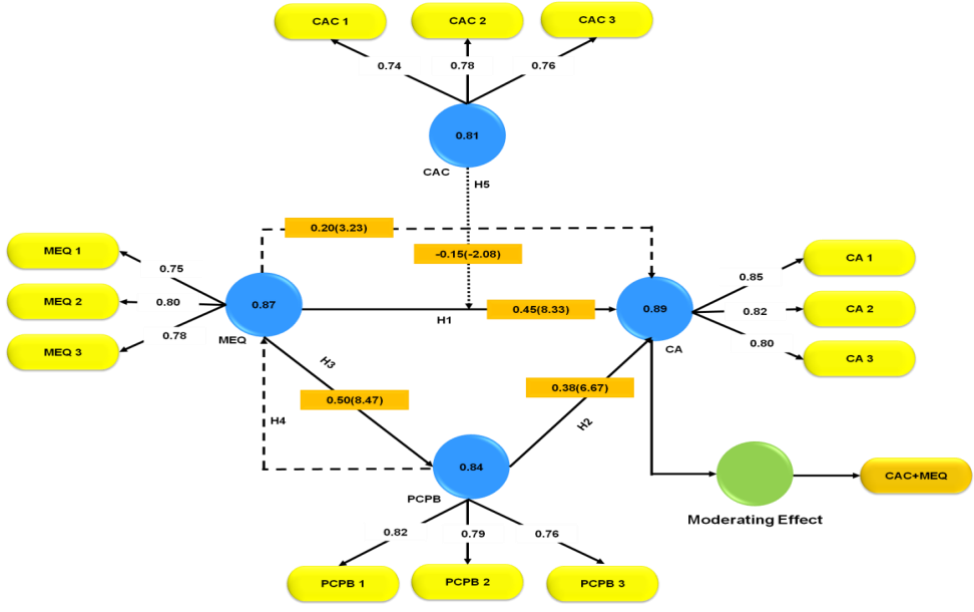

Figure 2: Result of Mediation model

Pathway estimates indicate that MEQ significantly influences CA both directly through PCPB, with CAC moderating this srelationship. Table 6 shows the results of the pathway estimates model.

Table 6: Result of Pathway Estimates

Pathway	β Estimate	SE	Estimate/SE	95% CI		p Value	Support
				Lower	Upper		
MEQ → CA	0.45	0.10	4.50	0.26	0.64	<0.001	***
PCPB → CA	0.38	0.11	3.45	0.17	0.59	<0.001	***
MEQ → PCPB	0.50	0.09	5.56	0.32	0.68	<0.001	***
PCPB → MEQ → CA	0.20	0.08	2.50	0.05	0.35	0.013	**
CAC → MEQ → CA	-0.15	0.07	-2.14	-0.28	-0.02	0.032	**

Note: ** denotes moderate support with p-values < 0.05, while *** denotes strong support with p-values < 0.001.

Important correlations between the variables under research are shown by the analysis. In particular, the estimate of 0.45 ($p < 0.001$, Standard Error (SE) = 0.10) for the pathway from MEQ to CA represents a considerable positive influence. With an estimate of 0.38 (SE = 0.11, $p < 0.001$), PCPB also has a favorable impact on CA. With an estimate of 0.50 (SE = 0.09, $p < 0.001$), MEQ's impact on PCPB is effective. With an estimate of 0.20 (SE = 0.08, $p = 0.013$), PCPB mediates the link between MEQ → CA. With an estimate of -0.15 (SE =-0.07, $p = 0.032$), CAC moderates the link between MEQ → CA.

DISCUSSION

The present study underscores the significant influence of medical education quality on the career adaptability of international medical students in China, revealing that proactive career planning behavior serves as a crucial mediating factor in this relationship. This finding aligns with recent research emphasizing the pivotal role of educational quality in shaping student outcomes, particularly in fostering the skills and competencies necessary for navigating the complex global medical landscape (Li et al., 2020). High-quality medical education equips students with up-to-date knowledge, practical skills, and a strong professional identity, thereby enhancing their confidence and readiness to adapt to evolving career demands (Xu et al., 2022). The mediating effect of proactive career planning behavior highlights the importance of self-directed career management activities, such as setting clear career goals, seeking mentorship, and engaging in continuous professional development, which are essential for building adaptability and resilience in a competitive job market (Zhang et al., 2023). These proactive behaviors enhance career decision-making self-efficacy, a concept supported by Social Cognitive Career Theory (Lent & Brown, 2019), which posits that self-efficacy beliefs influence career-related behaviors and outcomes. Moreover, the moderating role of cultural adjustment challenges sheds light on the complex interplay between individual factors and the broader sociocultural context in which international students operate. Cultural adaptation difficulties can impede students' ability to fully engage with educational resources and participate in proactive career planning, thereby diminishing the positive impact of high-quality education on career adaptability (Dai & Zhao, 2021). This underscores the necessity for educational institutions to provide robust support systems that address language barriers, cultural differences, and social integration challenges, enabling international students to maximize the

benefits of their educational experiences (Jiang et al., 2023). The findings suggest that enhancing medical education quality alone is insufficient; a holistic approach that incorporates support for proactive career planning and facilitates cultural adjustment is imperative for optimizing career adaptability and success among international medical students. These insights contribute to the existing literature by integrating Career Construction Theory and acknowledging the critical role of contextual factors in career development processes (Wang et al., 2020). Future research should explore longitudinal designs to examine the causal relationships among these variables and consider diverse cultural contexts to generalize the findings more broadly. By addressing these dimensions, educational institutions and policymakers can better support international students, ultimately fostering a more adaptable and globally competent medical workforce (Shi et al., 2023).

CONCLUSION

The study highlights the critical role that high-quality medical education plays in enhancing the career adaptability of international students, particularly through the mediating influence of proactive career planning behavior. It also underscores the importance of addressing cultural adjustment challenges that can moderate this relationship, thereby affecting students' ability to fully leverage educational quality to improve career outcomes. These findings emphasize the need for educational strategies that go beyond academic content, promoting proactive career planning and offering support systems that help international students overcome cultural barriers. By doing so, institutions can better prepare students for the dynamic demands of the global healthcare industry. Ultimately, this study contributes valuable insights for educators and policymakers aiming to enhance the career adaptability and overall success of international medical students.

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