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Impact of Neurosurgery Clerkship on Medical Students' Perception of Being a Physician and Professional Identity

Nöroşirürji Stajının Tıp Fakültesi Öğrencilerinin Doktorluk Algısı ve Profesyonel Kimlikleri Üzerindeki Etkisi

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Abstract

Aim: The aim of this study was to evaluate the impact of the neurosurgery clerkship on fifth-year medical students' perceptions of the medical profession, professional identity, and learning experiences.

Material and Method: This cross-sectional, questionnaire-based study included 116 fifth-year medical students who had completed their neurosurgery rotation. A structured survey instrument was used to assess students' demographic characteristics, perceptions of neurosurgery, sources of motivation, factors influencing the learning process, perceptions of burnout, and anticipated changes in their outlook on the medical profession following the rotation. Comparisons between groups were performed using the Chi-square test.

Results: A total of 60.3% of participants reported that they expected a positive change in their perspective on the medical profession following completion of the neurosurgery clerkship. Neurosurgery was perceived as highly satisfying, particularly due to its association with life-saving surgical interventions and the management of complex clinical cases. The most challenging component of surgical practice was identified as making rapid intraoperative decisions. The presence of an experienced mentor was the most influential factor enhancing the learning experience, whereas burnout was most commonly associated with disruption of work–life balance.

Conclusion: The neurosurgery clerkship provides medical students with a transformative educational experience that contributes not only to technical learning but also to the strengthening of professional identity and attitudes toward the medical profession. These findings suggest that clerkship models incorporating mentorship and structured clinical responsibility may play a critical role in supporting professional identity formation in medical education.

Keywords: Neurosurgery clerkship, medical education, professional identity, perception of medicine, mentorship, medical students

Öz

Amaç: Bu çalışmanın amacı, nöroşirürji stajının 5. sınıf tıp fakültesi öğrencilerinin tıp mesleğine bakışları, profesyonel kimlik algıları ve öğrenme deneyimleri üzerindeki etkisini değerlendirmektir.

Gereç ve Yöntem: Bu kesitsel ve anket temelli çalışmaya, nöroşirürji stajını tamamlamış 116 adet 5. sınıf tıp fakültesi öğrencisi dâhil edildi. Yapılandırılmış bir anket formu kullanılarak öğrencilerin demografik özellikleri, nöroşirürjiye ilişkin algıları, motivasyon kaynakları, öğrenme sürecini etkileyen faktörler, tükenmişlik algıları ve staj sonrasında tıp mesleğine bakışlarında beklenen değişimler değerlendirildi. Gruplar arası karşılaştırmalar Ki-kare testi ile yapıldı.

Bulgular: Katılımcıların %60,3'ü, nöroşirürji stajını tamamladıktan sonra tıp mesleğine bakışlarında olumlu bir değişim beklediklerini bildirdi. Nöroşirürji, özellikle hayat kurtarıcı cerrahi girişimler ve karmaşık klinik vakaların yönetimi ile ilişkili olması nedeniyle yüksek düzeyde tatmin edici bir alan olarak değerlendirildi. Cerrahi uygulamanın en zorlayıcı bileşeni, operasyon sırasında hızlı karar verme olarak tanımlandı. Deneyimli bir mentor varlığı öğrenme sürecini en fazla güçlendiren faktör olurken, tükenmişliğin en sık iş–özel yaşam dengesi bozulması ile ilişkili olduğu bildirildi.

Sonuç: Nöroşirürji stajı, tıp fakültesi öğrencilerine yalnızca teknik öğrenmeye katkı sağlayan bir süreç değil, aynı zamanda profesyonel kimlik ve tıp mesleğine yönelik tutumların güçlenmesine katkıda bulunan dönüştürücü bir eğitim deneyimi sunmaktadır. Elde edilen bulgular, mentorluk ve yapılandırılmış klinik sorumluluk içeren staj modellerinin tıp eğitiminde profesyonel kimlik gelişimini desteklemede kritik rol oynayabileceğini göstermektedir.

Anahtar Kelimeler: Nöroşirürji stajı, tıp eğitimi, profesyonel kimlik, tıp mesleğine bakış, mentorluk, tıp öğrencileri

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INTRODUCTION

The primary aim of medical education is not only to equip students with knowledge and technical skills, but also to train physicians who internalize professional values, possess a strong sense of responsibility, and have a well-developed professional identity. In this context, the concept of Professional Identity Formation (PIF), which has received increasing emphasis in the recent medical education literature, has emerged as a central framework describing the longitudinal process through which students begin to "think, act, and feel like a physician" over time.[1-3] PIF is a dynamic construct shaped not only by the formal curriculum, but also by the interplay of the clinical environment, role modeling, learning climate, and the hidden curriculum.[4,5]

Clinical clerkships represent one of the most critical phases in which professional identity development is most profoundly experienced. During this period, students have the opportunity to apply theoretical knowledge to real patient care settings while engaging directly with core elements of medical practice such as clinical decision making, assuming responsibility, and participating in team-based care.[6] Previous studies have demonstrated that clerkship experiences can significantly influence students' perceptions of the medical profession, the meaning they attribute to being a doctor, and their future professional attitudes.[7] This influence extends beyond career choice and manifests at a broader level through professional self-concept and identity development.[8]

Surgical clerkships, particularly those involving high levels of risk and responsibility, occupy a unique position in the context of professional identity formation. Within surgical disciplines, students frequently encounter acute clinical situations, are exposed to decision making under time pressure, and directly witness the outcomes of interventions.[9] These characteristics suggest that surgical rotations provide a powerful learning environment not only for technical competence, but also for internalizing the ethical, cognitive, and emotional dimensions of the physician's role.[10]

Neurosurgery is a distinctive surgical field characterized by high cognitive demand, advanced technical skills, and life-critical clinical decisions. Owing to these features, neurosurgery clerkships may be perceived by students as both highly inspiring and considerably challenging educational experiences.[11,12] The literature includes studies indicating that early exposure to neurosurgery and mentorship-supported training models can positively influence students' interest in and attitudes toward the field.[13,14] However, most existing research predominantly focuses on neurosurgery clerkships in relation to career interest or specialty choice, while their broader impact on perceptions of the medical profession and professional identity development remains relatively underexplored.

Meanwhile, the increasing prevalence of stress, burnout, and concerns regarding work–life balance among medical students highlights the importance of considering the psychosocial effects of clinical training.[15] Exposure to intense and demanding clinical environments has been reported to shape students' perceptions of the medical profession in both positive and negative ways.[16,17] Therefore, evaluating how a highly demanding and responsibility-driven clerkship such as neurosurgery influences students' perspectives on medicine is of substantial pedagogical relevance for medical education.

The aim of this study was to evaluate the impact of the neurosurgery clerkship on fifth-year medical students' perceptions of the medical profession, professional identity development, and professional attitudes. Additionally, by examining students' perceptions of neurosurgery, motivational drivers, factors influencing the learning process, and perceptions of burnout, this study aimed to provide a more comprehensive understanding of the educational and transformative role of neurosurgery clerkships within medical education.

MATERIAL AND METHOD

Study Design and Ethical Approval

This study was designed as a cross-sectional, descriptive, and analytical survey to evaluate the impact of the neurosurgery clerkship on medical students' perceptions of the medical profession and professional identity. The research was conducted in accordance with the principles of the Declaration of Helsinki, and ethical approval was obtained from the Tokat Gaziosmanpaşa University Non-Interventional Scientific Research Ethics Committee (02.12.2025, Approval No: 25-MOBAEK-421). Participation in the study was voluntary, and informed consent was obtained from all participants.

Study Population and Sample

The study population consisted of fifth-year medical students who completed their neurosurgery clerkship during the 2024–2025 academic year. A total of 116 students who had completed the neurosurgery rotation and fully completed the questionnaire were included in the study. Students who provided incomplete questionnaire responses or did not wish to participate were excluded. A convenience sampling method aiming to include the entire accessible population was employed.

Data Collection Instrument

Data were collected using a structured questionnaire developed by the researchers based on relevant literature. The questionnaire consisted of three main sections:

1. **Demographic Information:** This section included items on age, gender, and interest in potential future specialty preference.

2. **Perceptions of Neurosurgery and Learning Experience:** This section evaluated students' perceptions of a neurosurgical career, factors they found satisfying, surgical stages they perceived as challenging during the rotation, sources of motivation, and factors influencing the learning process.
3. **Perception of the Medical Profession and Burnout:** This section assessed anticipated changes in students' outlook on the medical profession before and after the neurosurgery clerkship, perceptions of burnout within neurosurgery, and factors believed to contribute to burnout.

All questionnaire items were presented in a multiple-choice format, and each question was structured to allow participants to select only a single response option.

Variables

The primary dependent variable of the study was the students' expectation of a positive change in their perception of the medical profession following the neurosurgery clerkship.

Independent variables included age group, gender, interest in future specialty preference, perceptions of neurosurgery, factors influencing the learning process, and perceived causes of burnout.

Statistical Analysis

Statistical analyses were performed using IBM SPSS Statistics software (IBM SPSS Statistics 22, SPSS Inc., an IBM Company, Somers, NY). Categorical variables were presented as numbers (n) and percentages (%).

Group comparisons were conducted to examine the relationships between questionnaire responses and the following variables:

- Age (≤25 years />25 years)
- Gender (female / male)
- Specialty interest (surgical, medical, other)

Associations were evaluated using the Chi-square (χ^2) test. When expected cell frequencies were below 5, appropriate statistical corrections were applied. A p-value of<0.05 was considered statistically significant.

Control of Bias and Study Limitations

Given the cross-sectional, questionnaire-based design of the study, causality could not be inferred. To minimize social desirability bias, the survey was administered anonymously, and participants were clearly informed that their responses would not affect their academic evaluations. The questionnaire items were structured to comprehensively reflect students' clerkship experiences.

RESULTS

Demographic Characteristics of the Participants

A total of 116 fifth-year medical students were included in the study. The majority of the participants were under 25 years of age (87.1%, n=101). Of the students, 58.6% (n=68) were female and 41.4% (n=48) were male. Regarding specialty preference, 52.6% expressed interest in medical specialties, 42.2% in surgical specialties, while 5.2% preferred other fields. Detailed demographic and baseline characteristics of the participants are presented in **Table 1**.

Table 1. Demographic Characteristics and Perceptions of Neurosurgery Among Participants

	n	%
Age		
≤ 25 years	101	(87.1)
>25 years	15	(12.9)
Gender		
Female	68	(58.6)
Male	48	(41.4)
Preferred Field of Specialization		
Surgical Sciences	49	(42.2)
Medical (Internal) Sciences	61	(52.6)
Other	6	(5.2)
Most Satisfying Aspect of a Neurosurgical Career		
Contributing to scientific research	3	(2.6)
Performing life-saving surgeries	69	(59.5)
Gaining highly advanced technical skills	15	(12.9)
Satisfaction from solving complex cases	29	(25.0)
Perceived Impact of Neurosurgical Practice on Personal Life		
Reduced time with family	16	(13.8)
Difficulty maintaining work–life balance	35	(30.2)
Restricted social life due to long working hours	27	(23.3)
Psychological stress due to high workload	38	(32.8)
Most Challenging Stage of Neurosurgical Practice		
Learning surgical techniques	23	(19.8)
Preoperative preparation	4	(3.4)
Making rapid intraoperative decisions	83	(71.6)
Postoperative patient care	6	(5.2)
Primary Source of Motivation During the Clerkship		
Aspiration to become a highly competent physician	65	(56.0)
Opportunity to improve patient outcomes	21	(18.1)
Engaging with complex cases	15	(12.9)
Developing technical skills	15	(12.9)
Main Factor Influencing Learning During the Clerkship		
Presence of an experienced mentor	55	(47.4)
Opportunity for direct patient interaction	11	(9.5)
Longer exposure to clinical practice	17	(14.7)
Translating theoretical knowledge into practice	33	(28.4)
Most Common Cause of Burnout in Neurosurgery		
Mental workload during surgery	23	(19.8)
Severity of patients' clinical condition	8	(6.9)
Disruption of work–life balance	63	(54.3)
Prolonged on-call duties	22	(19.0)
Expectation of Positive Change After Clerkship		
Yes	70	(60.3)
No	8	(6.9)
Undecided	38	(32.8)

Perceptions of Neurosurgery and Professional Evaluations

In response to the question, "What is the most satisfying aspect of a neurosurgical career?", the majority of students identified "performing life-saving surgeries" (59.5%, n=69) as the most fulfilling factor. This was followed by "the satisfaction of managing complex cases" (25.0%, n=29) and "acquiring advanced technical skills" (12.9%, n=15). "Contributing to scientific research" was selected at a considerably lower rate (2.6%, n=3) (**Table 1**).

When asked, "How do you think neurosurgical practice most affects a physician's personal life?", the most frequently reported response was "psychological distress due to high stress" (32.8%, n=38), followed by "difficulty in maintaining work–life balance" (30.2%, n=35). "Restricted social life" (23.3%, n=27) and "reduced time with family" (13.8%, n=16) were less commonly indicated (**Table 1**).

Perceptions Related to the Surgical Process and Motivation

Most students identified "making rapid intraoperative decisions" as the most challenging aspect of neurosurgical practice (71.6%, n=83). Learning surgical techniques (19.8%, n=23), postoperative patient care (5.2%, n=6), and preoperative preparation (3.4%, n=4) were perceived as less challenging (**Table 1**).

The primary source of motivation during the neurosurgery clerkship was "the desire to become a well-qualified physician" (56.0%, n=65). This was followed by "the opportunity to improve patient outcomes" (18.1%, n=21), "engaging with complex cases" (12.9%, n=15), and "developing technical skills" (12.9%, n=15) (**Table 1**).

The most influential factor affecting learning during the rotation was reported as "the presence of an experienced mentor" (47.4%, n=55). Translating theoretical knowledge into clinical practice (28.4%, n=33), the length of clinical exposure (14.7%, n=17), and opportunities for direct patient interaction (9.5%, n=11) were reported less frequently (**Table 1**).

Perception of Burnout and Views on the Medical Profession

In response to the question, "What do you think is the most common cause of burnout in neurosurgery?", more than half of the students indicated "disruption of work–life balance" (54.3%, n=63). "Mental workload during surgery" (19.8%, n=23) and "prolonged on-call duties" (19.0%, n=22) were reported at similar rates, whereas "the severe clinical condition of patients" was less frequently mentioned (6.9%, n=8) (**Table 1**).

When asked, "Do you think your perception of the medical profession will change positively after the neurosurgery clerkship?", 60.3% (n=70) responded "Yes," 32.8% (n=38) were undecided, and 6.9% (n=8) responded "No" (**Table 1**).

Subgroup Analyses

No statistically significant differences were observed between age groups in any of the evaluated parameters (all p>0.05). Age-based distributions and Chi-square test results are presented in **Table 2**.

Table 2. Distribution of Responses by Age Group

	Age		p
	≤25 Years n (%)	>25 Years n (%)	
What do you think is the most satisfying aspect of choosing a neurosurgical career?			
Contributing to scientific research	2 (2.0)	1 (6.7)	0.160
Performing life-saving surgeries	57 (56.4)	12 (80.0)	
Gaining highly advanced technical skills	14 (13.9)	1 (6.7)	
Satisfaction from solving complex cases	28 (27.7)	1 (6.7)	
How may neurosurgical practice most affect the personal life of physicians?			
Reduced time with family	11 (10.9)	5 (33.3)	0.131
Difficulty maintaining work–life balance	32 (31.7)	3 (20.0)	
Restricted social life due to long working hours	24 (23.8)	3 (20.0)	
Psychological distress due to high stress	34 (33.7)	4 (26.7)	
Which stage of neurosurgical practice do you consider the most challenging?			
Learning surgical techniques	19 (18.8)	4 (26.7)	0.594
Preoperative preparation	4 (4.0)	-	
Making rapid intraoperative decisions	72 (71.3)	11 (73.3)	
Postoperative patient care	6 (5.9)	0 (.0)	
What is the greatest source of motivation for neurosurgery trainees?			
Aspiration to become a highly competent physician	56 (55.4)	9 (60.0)	0.693
Opportunity to improve patient outcomes	19 (18.8)	2 (13.3)	
Engaging with complex cases	14 (13.9)	1 (6.7)	
Developing technical skills	12 (11.9)	3 (20.0)	
Which factor most influences the learning process during the neurosurgery clerkship?			
Presence of an experienced mentor	49 (48.5)	6 (40.0)	0.844
Opportunity for direct patient interaction	9 (8.9)	2 (13.3)	
Longer exposure to clinical practice	14 (13.9)	3 (20.0)	
Opportunity to translate theory into practice	29 (28.7)	4 (26.7)	
What is the most common cause of burnout in neurosurgery?			
Mental workload during surgery	21 (20.8)	2 (13.3)	0.923
Severity of patients' clinical condition	7 (6.9)	1 (6.7)	
Disruption of work–life balance	54 (53.5)	9 (60.0)	
Prolonged on-call duties	19 (18.8)	3 (20.0)	
Do you expect a positive change in your perception of the medical profession after the neurosurgery clerkship?			
Yes	59 (58.4)	11 (73.3)	0.394
No	8 (7.9)	0 (.0)	
Undecided	34 (33.7)	4 (26.7)	

In gender-based analyses, most parameters showed no significant difference; however, burnout being attributed to "mental workload during surgery" was significantly more frequently reported by female students compared with males (26.5% vs. 10.4%; p=0.050). No other gender-related differences were statistically significant (**Table 3**).

Comparisons according to specialty interest (surgical, medical, or other fields) revealed no statistically significant differences across any of the study variables (all p>0.05). Detailed findings of this analysis are presented in **Table 4**.

Table 3. Distribution of Responses by Gender

	Gender		p
	Female n (%)	Male n (%)	
What do you think is the most satisfying aspect of choosing a neurosurgical career?			
Contributing to scientific research	1 (1.5)	2 (4.2)	0.229
Performing life-saving surgeries	45 (66.2)	24 (50.0)	
Gaining highly advanced technical skills	9 (13.2)	6 (12.5)	
Satisfaction from solving complex cases	13 (19.1)	16 (33.3)	
How may neurosurgical practice most affect the personal life of physicians?			
Reduced time with family	10 (14.7)	6 (12.5)	0.810
Difficulty maintaining work–life balance	20 (29.4)	15 (31.3)	
Restricted social life due to long working hours	14 (20.6)	13 (27.1)	
Psychological distress due to high stress	24 (35.3)	14 (29.2)	
Which stage of neurosurgical practice do you consider the most challenging?			
Learning surgical techniques	10 (14.7)	13 (27.1)	0.141
Preoperative preparation	4 (5.9)	-	
Making rapid intraoperative decisions	51 (75.0)	32 (66.7)	
Postoperative patient care	3 (4.4)	3 (6.3)	
What is the greatest source of motivation for neurosurgery trainees?			
Aspiration to become a highly competent physician	37 (54.4)	28 (58.3)	0.179
Opportunity to improve patient outcomes	16 (23.5)	5 (10.4)	
Engaging with complex cases	9 (13.2)	6 (12.5)	
Developing technical skills	6 (8.8)	9 (18.8)	
Which factor most influences the learning process during the neurosurgery clerkship?			
Presence of an experienced mentor	29 (42.6)	26 (54.2)	0.566
Opportunity for direct patient interaction	8 (11.8)	3 (6.3)	
Longer exposure to clinical practice	10 (14.7)	7 (14.6)	
Opportunity to translate theory into practice	21 (30.9)	12 (25.0)	
What is the most common cause of burnout in neurosurgery?			
Mental workload during surgery	18 (26.5) a	5 (10.4) b	0.050*
Severity of patients' clinical condition	3 (4.4)	5 (10.4)	
Disruption of work–life balance	32 (47.1)	31 (64.6)	
Prolonged on-call duties	15 (22.1)	7 (14.6)	
Do you expect a positive change in your perception of the medical profession after the neurosurgery clerkship?			
Yes	39 (57.4)	31 (64.6)	0.524
No	4 (5.9)	4 (8.3)	
Undecided	25 (36.8)	13 (27.1)	

Tablo 4. Distribution of Responses by Specialty Interest Area

	Specialty Interest Area			p
	Surgical Sciences n (%)	Medical (Internal) Sciences n (%)	Other n (%	
What do you think is the most satisfying aspect of choosing a neurosurgical career?				
Contributing to scientific research	1 (2.0)	2 (3.3)	0 (.0)	0.991
Performing life-saving surgeries Gerçekleştirmek	29 (59.2)	37 (60.7)	3 (50.0)	
Gaining highly advanced technical skills	6 (12.2)	8 (13.1)	1 (16.7)	
Satisfaction from solving complex cases	13 (26.5)	14 (23.0)	2 (33.3)	
How may neurosurgical practice most affect the personal life of physicians?				
Reduced time with family	7 (14.3)	8 (13.1)	1 (16.7)	0.730
Difficulty maintaining work–life balance	16 (32.7)	18 (29.5)	1 (16.7)	
Restricted social life due to long working hours	14 (28.6)	12 (19.7)	1 (16.7)	
Psychological distress due to high stress	12 (24.5)	23 (37.7)	3 (50.0)	
Which stage of neurosurgical practice do you consider the most challenging?				
Learning surgical techniques	11 (22.4)	11 (18.0)	1 (16.7)	0.660
Preoperative preparation	1 (2.0)	2 (3.3)	1 (16.7)	
Making rapid intraoperative decisions	34 (69.4)	45 (73.8)	4 (66.7)	
Postoperative patient care	3 (6.1)	3 (4.9)	0 (.0)	
What is the greatest source of motivation for neurosurgery trainees?				
Aspiration to become a highly competent physician	29 (59.2)	34 (55.7)	2 (33.3)	0.302
Opportunity to improve patient outcomes	9 (18.4)	12 (19.7)	0 (.0)	
Engaging with complex cases	7 (14.3)	6 (9.8)	2 (33.3)	
Developing technical skills	4 (8.2)	9 (14.8)	2 (33.3)	
Which factor most influences the learning process during the neurosurgery clerkship?				
Presence of an experienced mentor	28 (57.1)	26 (42.6)	1 (16.7)	0.513
Opportunity for direct patient interaction	3 (6.1)	7 (11.5)	1 (16.7)	
Longer exposure to clinical practice	6 (12.2)	10 (16.4)	1 (16.7)	
Opportunity to translate theory into practice	12 (24.5)	18 (29.5)	3 (50.0)	
What is the most common cause of burnout in neurosurgery?				
Mental workload during surgery	7 (14.3)	15 (24.6)	1 (16.7)	0.349
Severity of patients' clinical condition	1 (2.0)	6 (9.8)	1 (16.7)	
Disruption of work–life balance	32 (65.3)	28 (45.9)	3 (50.0)	
Prolonged on-call duties	9 (18.4)	12 (19.7)	1 (16.7)	
Do you expect a positive change in your perception of the medical profession after the neurosurgery clerkship?				
Yes	31 (63.3)	35 (57.4)	4 (66.7)	0.747
No	2 (4.1)	6 (9.8)	0 (.0)	
Undecided	16 (32.7)	20 (32.8)	2 (33.3)	

P: Chi-square test, *p-value<.05 indicates statistical significance. Different superscripts indicate significant differences between groups.

DISCUSSION

The principal finding of this study is that the neurosurgery clerkship is perceived by students not merely as an opportunity to acquire technical knowledge and surgical skills, but as a pivotal educational experience that shapes their perceptions of the medical profession and contributes to professional identity development. The fact that the majority of participants anticipated a positive change in their outlook on the medical profession following the rotation is consistent with the increasingly emphasized concept of Professional Identity Formation (PIF) in contemporary medical education literature.[1,3,4] The PIF framework highlights that the ultimate goal of medical education extends beyond imparting knowledge and competence; it encompasses guiding students through a longitudinal process in which they progressively "learn to think, feel, and act like a physician".[1,4]

In our study, the fact that "performing life-saving surgeries" emerged as the most satisfying aspect of neurosurgery suggests that clinical exposure reinforces the meaning students attribute to the medical profession. Previous studies demonstrating an association between clerkship satisfaction and professional self-concept have similarly reported that assuming substantial patient responsibility and witnessing tangible clinical outcomes help students develop a clearer understanding of the physician's role.[7] In this context, the neurosurgery clerkship may enable students to experience more explicitly the societal and ethical responsibilities inherent in the practice of medicine.

Students' identification of rapid intraoperative decision-making as the most challenging aspect of neurosurgery suggests that this rotation substantially heightens perceptions of cognitive load and responsibility. This phenomenon may be explained through the framework of

the hidden curriculum in medical education. The hidden curriculum encompasses informal yet powerful learning processes through which students' professional values and identities are shaped by elements such as decision-making under time pressure, hierarchical team dynamics, role modeling, and crisis management.[5] Unsurprisingly, this influence is expected to be more pronounced in high-risk, high-stakes disciplines such as neurosurgery.

In our study, the presence of an experienced mentor emerged as the most influential factor affecting the learning process, which may also help explain the positive shift observed in students' perceptions of the medical profession. The literature consistently demonstrates that mentorship and role modeling play a critical role in professional identity development, sense of belonging, and professional self-confidence.[3,4] Studies focusing on surgical clerkships have similarly shown that the attitudes and behaviors of residents and faculty significantly shape students' perceptions of surgical careers and, more broadly, of the medical profession.[9,18,19] Furthermore, neurosurgery-specific studies have reported that early exposure and mentorship-supported training programs positively influence students' attitudes toward both the field and the profession as a whole.[13,14]

On the other hand, students frequently described the impact of neurosurgical practice on personal life in terms of high stress, impaired work–life balance, and social limitations, highlighting that perceptions of the medical profession are multidimensional rather than uniformly positive. The finding that disruption of work–life balance was considered the most common cause of burnout aligns with systematic reviews indicating a high prevalence of burnout among medical students.[20] This suggests that while the neurosurgery clerkship may strengthen students' sense of meaning and idealism regarding the profession, it may simultaneously heighten awareness of issues related to sustainability of medical practice and personal well-being.

In gender-based analyses, the fact that female students more frequently attributed burnout to "mental workload during surgery" parallels previous literature reporting gender-related differences in stress perception and susceptibility to burnout.[20] Although this finding does not imply causality, it underscores the importance of psychosocial support and psychologically safe learning environments in the design of surgical clerkships.

This study contributes to the existing literature in several important ways. First, it approaches the impact of the neurosurgery clerkship not only from the perspective of specialty choice or technical learning, but within a broader framework encompassing perceptions of the medical profession and professional identity development. This perspective aligns closely with contemporary PIF-centered medical education paradigms.[1,3,4] Second, the prominence of decision-making processes and mentorship offers concrete pedagogical insights into the educational value of neurosurgery clerkships. Third, the observation that similar trends were present independent of age, gender, and pre-existing specialty interest suggests that neurosurgery rotations may possess a transformative potential across the general medical student population.

Finally, the cross-sectional design and reliance on self-reported data necessitate that the findings be interpreted at the level of "anticipated or perceived change." Nevertheless, the consistent patterns observed across multiple subgroups support the notion that neurosurgery clerkships exert a meaningful educational influence on students' perceptions of the medical profession. Future research employing longitudinal designs, validated professional identity measures, and well-being indicators may provide stronger insight into the long-term outcomes of this influence.[21,22]

CONCLUSION

This study suggests that the neurosurgery clerkship is perceived by students as a transformative educational experience for medical students, extending beyond the acquisition of technical knowledge and clinical skills to meaningfully shaping their perceptions of the medical profession and professional identity. The finding that the majority of students anticipated a positive change in their outlook on medicine following the rotation suggests that exposure to high-responsibility clinical decision-making, witnessing life-saving interventions, and engaging in supervised hands-on practice may enhance the perceived meaning and value of the physician's role.

The fact that this effect was observed independent of age, gender, or pre-existing specialty interest indicates that neurosurgery clerkships may provide professional awareness and identity development not only for students aspiring to surgical careers, but for the broader medical student population. At the same time, students' heightened awareness of stress, work–life balance challenges, and burnout risk suggests that their perspective on the profession evolves in a manner that is not only idealistic but also more realistic and reflective.

In this context, our findings position the neurosurgery clerkship as a critical learning environment that may support aspects of professional identity formation within medical education and highlight the central role of mentorship, structured clinical responsibility, and authentic decision-making experiences in strengthening students' perceptions of the medical profession. These results suggest that structuring neurosurgery clerkship programs not solely around technical learning objectives, but also around pedagogical components that foster professional identity and perception of the physician's role, may yield meaningful long-term benefits for medical education.

ETHICAL DECLARATIONS

Ethics Committee Approval: The study was carried out with the permission of Tokat Gaziosmanpaşa University Non-Interventional Scientific Research Ethics Committee (Date: 02.12.2025, Decision No: 25-MOBAEK-421)

Informed Consent: All patients signed the free and informed consent form.

Referee Evaluation Process: Externally peer-reviewed.

Conflict of Interest Statement: The authors have no conflicts of interest to declare.

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