



General surgery residency training: Learning and teaching processes from the perspective of an educator?

Beyza Özçınar¹, Emine Vatansever², Ayşe Hilal Batı²

¹Department of General Surgery, İstanbul University, İstanbul Faculty of Medicine, İstanbul, Türkiye

²Department of Medical Education, Ege University Faculty of Medicine, İzmir, Türkiye

ABSTRACT

Objective: Educator perspectives on general surgery residency training have been insufficiently investigated in Türkiye. Understanding educational processes and institutional challenges may contribute to the development of standardized competency-based surgical training models. This study aimed to evaluate educators' perspectives on general surgery residency training in Türkiye, identify learning and teaching processes, and evaluate current educational practices that may inform future standardization efforts.

Material and Methods: A nationwide cross-sectional survey study was conducted among general surgery educators between August and December 2019. The questionnaire included 21 closed-ended and 3 open-ended questions evaluating educational structure, faculty involvement, and perceived adequacy of residency training programs. Survey questions were prepared following a literature review and expert evaluation. A pilot study involving 10 educators was conducted prior to national distribution.

Results: A total of 156 educators completed the survey. Although 97% of educators supported structured residency programs, only 44% considered the current curriculum content sufficient and fewer than one-fifth reported full curriculum implementation. Faculty members working simultaneously at private institutions reported lower institutional presence, despite perceiving their educational contribution as adequate. Participants also identified inconsistencies in curriculum implementation and faculty participation.

Conclusion: Educators perceive significant limitations in the standardization and implementation of general surgery residency training programs in Türkiye. Strengthening competency-based curricula, improving faculty engagement, and developing validated educational assessment tools may improve the quality of residency training.

Keywords: General surgery residency training, Türkiye, educator perspective, competency-based education, residents, standardized curricula

INTRODUCTION

The increasing complexity of healthcare systems, rapid advances in medical knowledge and variability in institutional resources have highlighted the need for standardization in medical education. This need extends beyond undergraduate education and includes residency training, where the development of competent specialists depends on structured educational programs, effective supervision, and clearly defined learning outcomes (1-5).

Residency training is commonly described through three interconnected domains: Structure, process, and outcomes. Structure refers to the institutions, regulations, and resources that support training. The process includes educational activities, clinical exposure, supervision and assessment methods. Outcomes represent the competencies expected from residents upon completion of training (5). In surgical specialties, residency programs are expected to develop cognitive knowledge, technical skills, clinical judgment, professionalism, communication skills, and lifelong learning habits (6).

Over the past two decades, competency-based medical education has become the dominant framework for postgraduate training worldwide. International educational models such as CanMEDS, the Accreditation Council for Graduate Medical Education (ACGME) competencies, and the Royal Australasian College of Surgeons framework have emphasized measurable competencies and educational outcomes rather than time-based training alone (7-12).

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Corresponding Author

Beyza Özçınar

E-mail: drbeyza@hotmail.com

ORCID ID: orcid.org/0000-0002-2385-141X

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In Türkiye, efforts to standardize postgraduate medical education have been supported by professional organizations and national regulatory bodies. The Board of Specialization in Medicine Curriculum Creation and Standard Determination System (TUKMOS) has developed specialty-specific curricula, including the General Surgery Core Curriculum, which was most recently updated in 2022 (12,13). The curriculum defines multiple competency domains and provides a framework for residency training. However, variability in curriculum implementation, educational content, faculty participation, and institutional resources continues to be reported across training centers (14-19).

While several studies have investigated residents' satisfaction, educational experiences, and perceived deficiencies in training programs, relatively few studies have examined residency education from the perspective of educators. Educators play a central role in the implementation of the curriculum, supervision, assessment, and professional development of residents. Understanding their perceptions may help identify barriers to effective training and contribute to future standardization efforts.

Therefore, this study aimed to evaluate educators' perspectives on general surgery residency training in Türkiye, to identify key learning and teaching processes, and to explore challenges affecting the implementation of residency education.

MATERIAL and METHODS

Study Design and Participants

This nationwide, cross-sectional survey was conducted between August and December 2019 to explore educators' perspectives on general surgery residency training in Türkiye. The study was based on the premise that limited information is available regarding educational standardization, faculty involvement, and curriculum implementation in general surgery residency programs.

The study sought to address two primary questions:

1. What are the key learning and teaching processes in general surgery residency training?
2. What challenges do educators encounter during the training process?

Survey Development

A structured electronic questionnaire consisting of 21 closed-ended and 3 open-ended questions was developed by the investigators following a review of the literature on competency-based medical education, surgical residency training, and curriculum standardization. International educational frameworks, including CanMEDS competencies, ACGME core competencies, and TUKMOS recommendations, were considered during questionnaire development.

The survey was designed to evaluate:

- Faculty involvement in residency training,
- Educational structure and curriculum implementation,
- Learning environments and teaching methods,
- Time allocated to educational activities,
- Perceived adequacy of training programs.

To improve content validity and clarity, the draft questionnaire was reviewed by experienced general surgery educators and subsequently pilot-tested with 10 educators from different institutions. Minor modifications were made based on participant feedback before nationwide distribution.

Data Collection

The survey was distributed electronically to general surgery educators working in university hospitals, private university hospitals, and training and research hospitals throughout Türkiye.

The survey link was initially shared through the Turkish Surgical Association, the largest professional organization representing general surgery educators and specialists in the country. To increase participation, reminder invitations were sent to general surgery specialists for whom contact information was available, followed by direct e-mail invitations to known educators involved in residency training.

Although the exact number of eligible educators was unavailable, the target population was estimated at approximately 400 educators actively involved in residency training. A total of 291 individuals responded to the survey. After excluding participants who were not actively involved in resident education or who did not complete the questionnaire, 156 completed responses were included in the final analysis, corresponding to an estimated response rate of 39%.

Qualitative Analysis

Responses to open-ended questions were independently reviewed by two investigators and grouped into recurring themes related to educational adequacy, faculty involvement, and institutional challenges. Qualitative findings were analyzed descriptively and used to complement the quantitative results. Because the survey was not designed as a formal qualitative study, no validated qualitative coding framework or thematic saturation analysis were performed.

Statistical Analysis

Survey responses were entered into an SPSS database for analysis. Descriptive statistics were used to summarize participant characteristics and survey responses. Associations between categorical variables were evaluated using chi-square tests. Continuous variables were analyzed using Student's t-test.

or One-Way Analysis of Variance, as appropriate. Statistical significance was defined as a two-sided p-value <0.05.

Because of the relatively limited sample size and unequal subgroup distributions, advanced multivariable analyses were not considered statistically reliable, and therefore were not performed. Consequently, the identified associations should be interpreted as exploratory rather than causal.

Ethical Considerations

Ethical approval was obtained from the İstanbul University Ethics Committee (approval no: 2015/504, date: 27.02.2015). Participation was voluntary, and all respondents provided informed consent before completing the survey.

RESULTS

A total of 156 educators completed the survey and were included in the analysis. The median age of participants was 48 years (range: 34-70 years). Most respondents were male (n=139, 89.1%); 17 (10.9%) were female. Professors constituted the largest academic group (n=81, 51.9%), followed by associate professors (n=50, 32.1%) and assistant professors (n=15, 9.6%). Most participants were employed at university hospitals (n=104, 66.7%) and more than half worked as faculty members for over 10 years (n=83, 53.2%) (Table 1).

Among respondents, 33 educators (21.2%) reported simultaneous employment in private institutions. The majority spent more than 75% of their professional time at their primary institution (n=114, 73.1%) and 131 (84.0%) considered this time allocation sufficient for educational activities (Table 2).

Table 1. Characteristics of the educators participating in the study		
	Number	%
Age [median (min-max)]	48 (34-70)	
Sex		
Female	17	10.9
Male	139	89.1
Academic title		
Assistant Professor	15	9.6
Associate Professor	50	32.1
Professor	81	51.9
Institution		
University hospital	104	66.7
Private university hospital	8	5.1
Education and research hospital	44	28.2
Total working time in the institution		
<5 years	22	14.1
5-10 years	31	19.9
>10 years	102	65.4
Duration of work as a faculty member		
<5 years	29	18.6
5-10 years	43	27.6
>10 years	83	53.2

There was broad agreement regarding the importance of structured residency education. Nearly all participants (n=152, 97.4%) stated that general surgery residency training should be conducted within a formal educational program. Furthermore, 114 educators (73.1%) reported implementing the national curriculum framework at their institutions. However, only 68 participants (43.6%) considered the current curriculum content sufficient, whereas 40 (25.6%) regarded it as insufficient (Table 2).

When asked about curriculum implementation, only 27 educators (17.3%) reported full implementation, whereas 73 educators (46.8%) indicated partial implementation, and 17 educators (10.9%) reported that the curriculum was not adequately implemented (Table 2). Although 134 respondents (85.9%) considered the duration of residency training adequate, perceptions of educational quality were less favorable. Only 35 educators (22.4%) considered the quality of the educational program sufficient, while 57 (36.5%) described it as partially sufficient, and 46 (29.5%) believed that improvements were needed (Table 3).

Table 2. Educators' views on education-1		
	Number	%
Simultaneous working in a private institution		
Yes	33	21.2
No	122	78.2
Proportion of time spent in the main institution (%)		
<25	13	8.3
25-50	10	6.4
50-75	17	10.9
>75	114	73.1
Time allocation sufficient for educational activities		
Yes	131	84.0
No	23	14.7
Need for a structured residency program		
Yes	152	97.4
No	1	0.6
Program currently implemented		
No	25	16.0
National Curriculum Framework	114	73.1
Their own programs	6	3.8
Foreign program	11	7.1
Curriculum content adequacy		
Sufficient	68	43.6
Insufficient	40	25.6
Undecided	7	4.5
Implementation of educational content		
Yes	27	17.3
No	17	10.9
Partially	73	46.8
Is the duration of the specialized training sufficient?		
Sufficient	134	85.9
Should be shorter	4	2.6
Should be longer	18	11.5

Faculty involvement in educational activities was generally perceived as moderate. Eighty educators (51.3%) rated faculty support as moderate, whereas only 37 (23.7%) considered it sufficient. Active participation in educational activities was reported by 72 educators (46.2%), while 40 (25.6%) reported only partial participation and 28 (17.9%) reported that participation was adequate, but could be improved (Table 3).

Regarding educational methods, respondents strongly supported clinical and practice-based learning environments. Operating room training was endorsed by 153 educators (98.1%), while clinic-based patient care and on-call training were each supported by 151 participants (96.8%). Seminars (93.6%), ward rounds (92.3%), outpatient clinic activities (92.3%), and minor

Table 3. Responses of educators to questions related to training-2		
	Number	%
Faculty support for educational activities		
Very little	20	12.8
Moderate	80	51.3
Sufficient	37	23.7
Sufficient but could be better	19	12.2
Active participation in educational activities		
Yes	72	46.2
No	16	10.3
Partially	40	25.6
Sufficient but could be better	28	17.9
Time allocated to educational activities		
Yes	92	59.0
No	63	40.4
Perceived quality of educational program		
Insufficient	17	10.9
Partially sufficient	57	36.5
Sufficient	35	22.4
Could be better	46	29.5

Table 4. Responses of educators to the question "What training methods should be used?"		
What educational methods should be used?	Number	%
Clinic patient care	151	96.8
Polyclinic practices	144	92.3
Minor procedures	143	91.7
Operating room	153	98.1
Shifts	151	96.8
Ward rounds	144	92.3
Seminars	146	93.6
Case discussions	130	83.3
Rotations	123	78.8
Congress-symposium	133	85.3
Research-thesis	0	0
Other:		
External center rotation	3	
Endoscopy	6	
Simulation-skills training	3	
Council-patient presentation	4	
Writing articles	5	
Courses	3	

surgical procedures (91.7%) were also frequently identified as essential components of residency education. Rotations received comparatively less support (78.8%) (Table 4).

Similarly, educators emphasized the importance of faculty participation across multiple educational settings. One hundred and forty-seven respondents (94.2%) supported participation in all surgical procedures and educational meetings, while 143 (91.7%) considered faculty involvement in case discussions essential. Participation in inpatient care activities was endorsed by 137 educators (87.8%), and involvement in outpatient care was endorsed by 127 educators (81.4%) (Table 5).

Several statistically significant associations were identified. Male educators were more likely than female educators to report simultaneous employment in private institutions ($p=0.022$). Female educators more frequently reported allocating sufficient time to educational activities ($p=0.039$). Compared with other academic ranks, professors were more commonly employed at university hospitals and reported greater participation in educational activities ($p=0.014$). Faculty members with more than 10 years of academic experience reported greater satisfaction with educational time allocation ($p=0.025$), curriculum implementation ($p=0.017$), and curriculum content adequacy ($p=0.029$) as satisfactory.

Educators working simultaneously in private institutions reported lower institutional presence despite perceiving their educational contribution as adequate. Although statistically significant associations were identified, these findings should be interpreted as exploratory because multivariable analyses were not performed.

Qualitative analysis yielded insights from three trainers who contended that faculty members need not actively engage in training. Detailed evaluation of their survey responses revealed that all three were male and employed at state universities for over 10 years. One trainer did not hold an adjunct position at a private institution, while the other two did. Their time commitments varied: two dedicated 50-75% of their schedules

Table 5. What educational activities should the faculty member participate in?		
Training activities that the faculty member is required to participate in	Number	%
Outpatient patient care	127	81.4
Inpatient patient care	137	87.8
All surgical procedures	147	94.2
All training meetings, seminars	147	94.2
All case meetings	143	91.7
Other		
- Thesis-publication studies	6	
- Advanced surgical procedures	3	
- Bedside visits	2	
- Socio-cultural activities	1	
- There is no need to participate in any of them.	1	

to their institutions, while one dedicated less than 25%; nevertheless, all three considered their commitments adequate. None of these trainers implemented a training program at their institutions.

DISCUSSION

This study provides a national overview of educators' perceptions regarding general surgery residency training in Türkiye. The findings suggest strong support for structured residency education among educators, while also highlighting concerns related to curriculum implementation, educational content, faculty participation, and standardization across institutions.

One of the most notable findings was the discrepancy between the widespread implementation of residency training programs and educators' perceptions of their adequacy. Although most participants reported the existence of a formal training program at their institution, fewer than half considered the curriculum content sufficient. This finding suggests that the presence of a structured program alone may not ensure effective implementation or educational quality. Similar concerns have been reported in previous studies evaluating postgraduate medical education in Türkiye, where trainees frequently described inconsistencies in curriculum delivery and educational opportunities (15-19).

The findings also emphasize the importance of faculty engagement in residency education. Participants generally viewed faculty involvement as essential for clinical teaching, surgical training, case discussions, and educational meetings. However, many educators reported only moderate levels of participation and indicated that faculty involvement could be improved. Because surgical training relies heavily on supervised clinical experience and mentorship, variability in educator participation may contribute to differences in educational experiences between institutions.

Another important observation was the relationship between faculty members' partly institutional presence and their perceived educational contribution. Educators simultaneously employed at private institutions tended to spend less time in their primary training centers, yet still perceived their educational contribution as adequate. Although this finding may reflect differences between perceived and actual educational involvement, the current study was not designed to objectively evaluate educational performance. Therefore, no conclusions can be drawn regarding the impact of this observation on resident outcomes or training quality.

The study further demonstrated that educators with greater academic experience were more likely to perceive educational time allocation, curriculum implementation, and program

content as adequate. This finding may reflect increased familiarity with institutional educational processes or differing expectations regarding residency training. However, additional research is needed to better understand the factors influencing these perceptions.

The qualitative findings complemented the quantitative results by identifying concerns regarding variability in curriculum implementation and faculty engagement. Several respondents emphasized that educational quality often depended on individual faculty commitment rather than consistently applied institutional standards. These observations support ongoing efforts to strengthen educational standardization within residency programs (12,19).

The findings of this study should also be interpreted within the broader context of competency-based medical education. International frameworks such as CanMEDS and ACGME competencies emphasize measurable educational outcomes, structured assessment, and continuous program evaluation. These principles form the foundation of competency-based medical education and have increasingly shaped postgraduate surgical training worldwide (7-11,20). While the TUKMOS General Surgery Core Curriculum provides an important framework for residency education in Türkiye, variability in implementation remains a challenge. Continued efforts toward curriculum standardization, faculty development, and educational quality assurance may help reduce these differences between institutions.

Study Limitations

Several limitations should be considered when interpreting the results. The response rate was relatively low, which may have introduced non-response bias. Data were collected in 2019, before the publication of the updated 2022 TUKMOS General Surgery Core Curriculum. In addition, the survey instrument underwent expert review and pilot testing, but was not formally psychometrically validated. Qualitative responses were analyzed descriptively and should, therefore, be interpreted cautiously. Because this was a cross-sectional perception-based study, the findings reflect educators' opinions rather than objective measures of educational quality and do not permit causal inferences.

Despite these limitations, this study contributes valuable national-level data regarding educators' perspectives on general surgery residency training. Given the limited number of studies focusing on educators rather than residents, these findings may help inform future curriculum development, faculty development initiatives, and efforts aimed at improving the consistency and quality of surgical residency education in Türkiye.

CONCLUSION

This national survey of general surgery educators identified important challenges related to curriculum implementation, educational content, faculty engagement, and standardization of residency training in Türkiye. Although there was strong support for structured and competency-based residency programs, educators reported substantial variability in program delivery and in perceived educational quality.

The findings suggest that strengthening curriculum implementation, promoting faculty participation, and establishing more consistent educational standards may contribute to improving residency training. Given that these results reflect educators' perceptions, future studies incorporating validated assessment tools and objective educational outcome measures are needed to better evaluate the effectiveness of residency education and guide ongoing curriculum development efforts.

Ethics

Ethics Committee Approval: Ethical approval was obtained from the Istanbul University Ethics Committee (approval no: 2015/504, date: 27.02.2015).

Informed Consent: Participation was voluntary, and all respondents provided informed consent before completing the survey.

Footnotes

Author Contributions

Concept - B.Ö., E.V., A.H.B.; Design - B.Ö., E.V., A.H.B.; Data Collection or Processing - B.Ö., E.V., A.H.B.; Analysis or Interpretation - B.Ö., E.V., A.H.B.; Literature Search - B.Ö., E.V., A.H.B.; Writing - B.Ö., E.V., A.H.B.

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