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Original Article

Evaluating the State of Medical Education Research in Turkey: A Descriptive Content Analysis of Publications from 1997 to 2019

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Abstract

Background: Medical education research has experienced substantial growth, yet comprehensive long-term evaluations of national publication trends, methodologies, and reporting quality remain limited.

Objectives: This study aims to conduct a comprehensive descriptive content analysis of empirical medical education articles published in Turkey between 1997 and 2019 to evaluate thematic, methodological, and statistical trends.

Methods: A systematic literature search was performed across ULAKBİM TR Dizin and DergiPark databases following PRISMA guidelines. A total of 82 empirical articles meeting the inclusion criteria were analyzed using an 11-variable Academic Publication Review Form (Cohen's κ=0.90).

Results: Publications markedly increased post-2011, peaking between 2017 and 2019. Quantitative designs dominated (50.5%), whereas qualitative and mixed-method designs were scarce. Most studies relied on surveys (42%) and scales (20%). Crucially, 71.9% of studies omitted sampling descriptions, and 85% failed to report validity metrics adequately. Advanced statistical modeling was rare, with descriptive statistics prevailing.

Conclusion: While Turkish medical education research has expanded quantitatively, significant methodological and reporting gaps persist, particularly regarding sampling transparency and psychometric validation. Strengthening methodological rigor and diversifying research designs are imperative for global scholarly integration.

Keywords: Medical Education; Bibliometrics; Content Analysis; Research Design; Turkey

Background

Medical education in Turkey has evolved through two broad historical periods: the pre-Republican era, including the late Ottoman period, and the Republican era (1, 2). The foundations of modern medical education in Turkey were laid with the establishment of the Tıbhâne-i Amire on March 14, 1827, a major turning point in the institutionalization of medical training (1, 3). Later, developments in medical education in Turkey were influenced by international reform movements, particularly the principles of the Flexner Report, which emphasized standardized, science-based medical training (4).

During the Republican period, medical education underwent significant institutional and curricular changes. Following the university reform of 1933, Istanbul University became the first university of the Republic, and its medical faculty adopted an educator-centered, discipline-based model, largely shaped by the German higher education tradition (2, 5). In the following decades, new medical faculties were established across the country, contributing to the expansion of medical education. Over time, this traditional model shifted toward more student-centered and problem-based approaches, in line with global developments in medical education (2, 5).

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In parallel with these curricular reforms, institutional structures supporting medical education research and development have emerged in Turkey. Specialized units dedicated to medical education were gradually established within faculties of medicine, marking an important step toward professionalizing the field (5). A notable example was the establishment of the Medical Education Research Institute at Istanbul Medical Faculty in 1977, which was later reorganized as the Medical Education Research and Application Center in 1983 (2, 5, 6). This process continued with the establishment of the first Department of Medical Education at the Ege University Faculty of Medicine in 1999, followed by similar departments at other major universities (2).

Overall, the history of medical education in Turkey reflects a transition from a centralized, instructor-centered model to a more diverse, learner-centered, and institutionally specialized structure. This historical development provides an important context for understanding the current scope and direction of medical education research in Turkey.

In parallel with the increase in medical faculties in our country, efforts to improve medical education and establish basic standards have been ongoing. In 2001, a significant step was taken in medical education with the initiation of the "National Core Education Program" (NCEP), marking a turning point in the development of medical education (6, 7). Following a dedicated and labor-intensive process, the National Core Education Program (NCCP-2002) was approved by the Medical Health Sciences Education Council on February 02, 2002, and implemented beginning in the 2003-2004 academic year (7). With NQAP-2002, all medical faculties in Turkey were directed to focus on their educational programs, and medical education was conducted in accordance with specific national standards for the first time (7). Subsequently, due to the changing health needs of society, shifts in priority health issues, modifications in health service delivery, policies and practices, and innovations introduced by the Bologna Process to our Higher Education system, it became necessary to update NQAP-2002 to reflect the changes in the fields of health and education across various platforms. Consequently, NQAP-2014 was implemented in all medical faculties starting from the 2015-2016 academic year (7).

An examination of the history of medical education reveals a continuous quest for improvement and ongoing efforts to enhance the education in this field. To provide optimal medical education, new research has consistently focused on faculty members and students, measurement and evaluation, assessment of educational methods, and the determination of medical students' needs. Although various studies on medical education exist, there is a need for a more in-depth examination of the published works in this field and the identification of significant findings. This study aimed to address these issues.

The development of universities and affiliated academic units is closely related to the publication of articles. In recent years, research in academic fields and the number of articles, journals, and graduate theses have increased (8). The primary criterion for determining a country's development level is the scientific knowledge produced by its universities through research. By analyzing research, which is the method of producing scientific knowledge, and the publications produced accordingly, information about the depth and prevalence of the research subject was collected, and a general view of the related field was elucidated (9–11). Such studies have made valuable contributions to knowledge generation and the shaping of educational practices. The analysis of studies conducted in a field provides information about the depth and frequency of use of the topics addressed and reveals the current state of the field (10, 12).

A comprehensive assessment of the current conditions is crucial for identifying potential future challenges and developing effective policies (10, 11). Given the growing body of research in the educational sciences, it is important to draw on individual studies' findings and systematically classify and evaluate the literature by its trends, focal topics, and results. Such analyses help clarify the field's overall development and may also provide a useful framework for examining research in related areas of education, including medical education. In this respect, evaluating the quality of publications in medical education is particularly important, as the findings of such research can inform medical educators, administrators, students, and decision makers (9).

Although comprehensive studies have examined the thematic and methodological tendencies of thesis research in the field of educational sciences in Turkey (13), research systematically evaluating the methodological characteristics of medical education research in Turkey remains limited. Several content analyses have addressed this field; for example, Özcan et al. (14) examined trends between 2000 and 2014, and Karaoğlu and Karaibrahimoğlu (15) focused on Turkish publications in three medical education journals.

However, a comprehensive thematic and methodological evaluation of the nationally indexed literature over a longer period (1997–2019) is still lacking. To address this gap, this study aimed to conduct a comprehensive thematic and methodological evaluation of research articles on medical education in Turkey. The year 2019 was purposefully selected as the temporal cutoff to establish a comprehensive pre-COVID-19 baseline of Turkish medical education research, thereby avoiding the structural anomalies and pandemic-induced paradigm shifts that abruptly altered medical curricula and publication priorities from 2020 onward, while also ensuring a complete and stable indexing cycle across national academic databases prior to subsequent structural platform migrations.

Specifically, this study sought to answer the following questions: (1) How are medical education research articles distributed across publication years and the number of authors? (2) Which thematic foci, as reflected in the keywords used, are the most prominent? (3) Which research designs, sampling techniques, target groups, and data collection tools are most frequently employed? (4) To what extent are validity, reliability, and statistical procedures reported in these studies? (5) What do these patterns suggest about the methodological development of the field?

Objectives

This study aims to conduct a comprehensive descriptive content analysis of empirical medical education articles published in Turkey between 1997 and 2019 to evaluate thematic, methodological, and statistical trends.

Methods

Research Design: This study was designed as a descriptive content analysis of research articles published in the field of medical education in Turkey, conducted through document analysis (16–20). A systematic literature search was conducted in accordance with the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines (21), and the retrieved studies were subsequently analyzed using qualitative content analysis. Although an earlier version of this work was framed as a qualitative case study, the analytic strategy and outputs of the present study—namely, the systematic coding of published articles into predefined categories and the reporting of frequencies, percentages, and categorical summaries—correspond more closely to a descriptive, document-based content analysis than to a case study in the strict methodological sense. The term "content analysis" is therefore used here to denote the systematic and replicable classification of the manifest methodological and thematic features of a defined body of published articles (18). Within this framework, the unit of analysis was the individual published research article, and the corpus under examination was the complete accessible body of medical education research articles produced in Turkey. It is indexed in the national databases described below.

Scope, Data Sources, and Search Strategy: The target population (universe) of this study comprised all research articles in the field of medical education authored in Turkey, written in Turkish or English, and indexed in the ULAKBİM TR Dizin and DergiPark databases under the Social Sciences and Health Sciences categories. These two national platforms were selected because they constitute the principal repositories of nationally indexed, peer-reviewed Turkish journals and provide open full-text access to the relevant literature. Because the study aimed to examine the entire accessible body of literature meeting these criteria rather than a subset, a census (complete enumeration) approach was adopted, and no sampling procedure was applied.

Database searches were conducted between September 2020 and February 2021 and covered all publications available up to December 31, 2019. The following Turkish keywords and their combinations were searched in the title, abstract, and keyword fields: “tıp eğitimi” (medical education), “mezuniyet öncesi tıp eğitimi” (undergraduate medical education), “tıp fakültesi” (faculty of medicine), “tıp öğrencisi” (medical student), and “tıp eğitimi araştırması” (medical education research). Boolean operators were used to combine these terms (for example, “tıp eğitimi” AND “tıp fakültesi”; “tıp öğrencisi” OR “mezuniyet öncesi tıp eğitimi”). No starting-year restriction was imposed; the earliest eligible record was dated 1997, so the effective search window spanned 1997 to 2019. Because ULAKBİM TR Dizin and DergiPark do not employ a controlled vocabulary and therefore do not support Medical Subject Headings (MeSH) indexing, free-text searching was necessary for this study. The Turkish search terms listed above were selected as direct equivalents of the corresponding MeSH descriptors (Education, Medical; Education, Medical, Undergraduate; Schools, Medical; Students, Medical), and the keywords reported in the present article were likewise drawn from the MeSH controlled vocabulary.

Inclusion and Exclusion Criteria: Records were included if they (a) addressed medical education as their primary subject, (b) were authored by researchers

affiliated with institutions in Turkey or examined the Turkish medical education context, (c) were indexed in ULAKBİM TR Dizin or DergiPark under the specified categories, (d) were available in full text, and (e) reported an empirical research study from which methodological features could be extracted. Records were excluded if they were editorials, letters to the editor, book reviews, conference abstracts or proceedings, duplicate records, or not directly related to medical education. Review articles do not follow empirical reporting conventions (e.g., sampling, data collection tools, and validity and reliability procedures) that underpin the coding frameworks. Therefore, they were identified during screening but not retained for the methodological analysis. The final analytic corpus consisted exclusively of empirical research articles. No language restrictions were applied beyond Turkish and English.

Study Selection: The systematic search and study selection processes were conducted in accordance with the PRISMA guidelines (21). Although the identification and screening of records are reported in accordance with the PRISMA framework, the present study is not a systematic review or meta-analysis; PRISMA was adopted solely as a transparent reporting structure for the search and selection process, while the retrieved articles were analyzed using descriptive content analysis. Database searches initially identified 155 records (ULAKBİM TR Dizin, n = 57; DergiPark, n = 98). After eight duplicate records were removed, 147 records were screened based on their titles and abstracts, and 20 were excluded as irrelevant. The remaining 127 full-text articles were assessed for eligibility, and 45 were excluded for the following reasons: not directly related to medical education (n = 9), editorial, letter, book review, or conference abstract (n = 6), duplicate publication (n = 11), full text not accessible (n = 12), and review articles excluded from methodological coding (n = 7). This process yielded a final analytical corpus of 82 research articles. The complete process of identification, screening, eligibility assessment, and inclusion is shown in Figure 1.

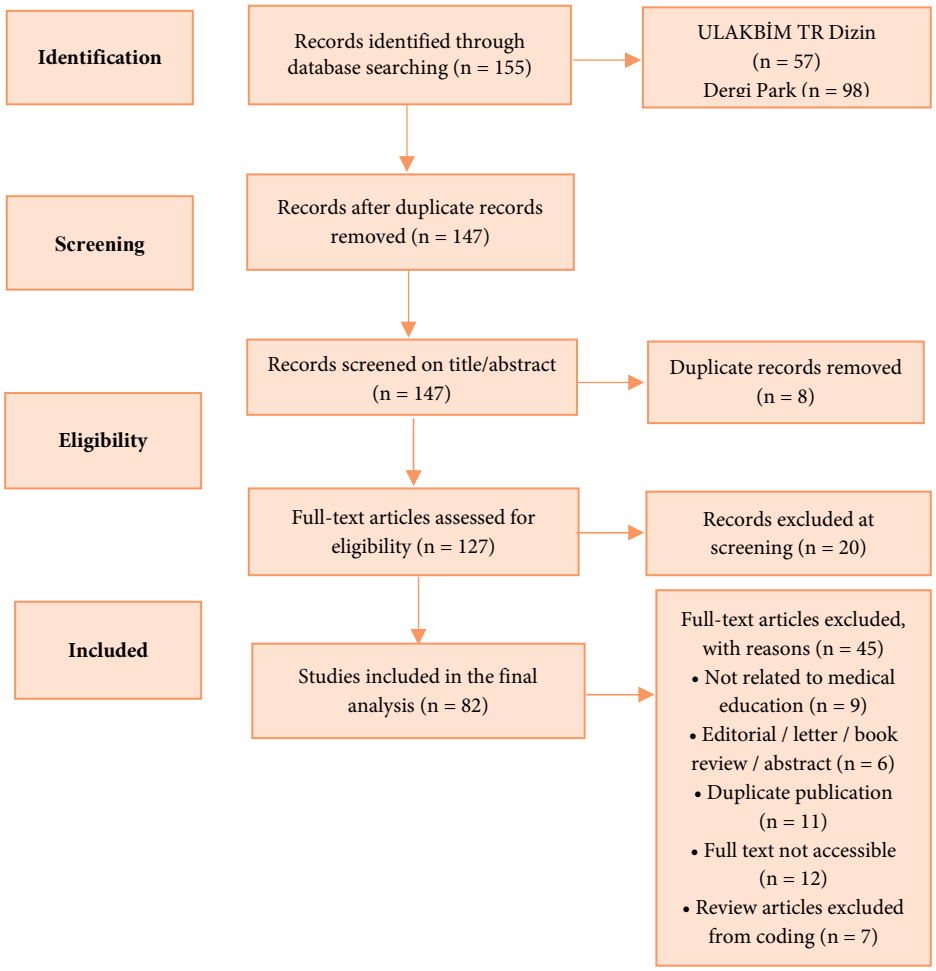


Figure 1. PRISMA flow diagram of the identification, screening, eligibility assessment, and inclusion of the research articles

Coding Framework and Data Extraction: Data were extracted using the Academic Publication Evaluation Form, originally developed and validated by Karadağ (18) and subsequently adapted for medical education in the present study (22). Each eligible article was converted to a digital format and assigned a unique code before coding. The form was used to record the following variables for every article: (1) year of publication, (2) number of authors, (3) keywords, (4) research model or design, (5) sample-selection (sampling) technique, (6) sample or target group (study population), (7) data-collection tools, (8) validity evidence and procedures, (9) reliability evidence and procedures, (10) statistical analysis techniques, and (11) reporting of ethics-committee approval. The full coding form is provided in Table 1.

Table 1. Academic Publication Evaluation Form (Coding Form)

Coded variable	Categories/values	Operational definition and coding rule
1. Publication year	1997–2019	Calendar year in which the article was published, taken from the article metadata.
2. Number of authors	1, 2, 3, … n	Total number of listed authors of the article.
3. Keywords	Author-supplied keywords	All keywords listed by the authors were recorded; a single article may contribute more than one keyword.
4. Research model/design	Quantitative; Qualitative (case study, phenomenology); Mixed-methods; Descriptive; Experimental; Cross-sectional; Scale development / adaptation; Retrospective; Prospective; …; Research model not specified	The design is explicitly named or unambiguously implied by the authors. "Not specified" was coded when no design was stated or could be inferred.
5. Sampling technique	Convenience; Purposive; Random; Stratified; Cluster; No sampling; Unspecified	Convenience = participants chosen by accessibility/availability; No sampling = an entire defined population or intact group was studied without selecting a subset; Unspecified = no technique was reported.
6. Sample/target group	Students; Faculty members; Interns; Physicians; Patients; Graduates; …; Unspecified	The group from which the data were collected. "Unspecified" was coded when the target group was not clearly defined.
7. Data-collection tools	Survey; Scale; Interview; Document analysis; Feedback form; Test; Observation; …; Unspecified	The instrument(s) used to gather data. A study may use more than one tool.
8. Validity evidence	Exploratory factor analysis; Confirmatory factor analysis; Item discrimination; Content/expert validity; Conducted but not reported; Unspecified	The procedure(s) reported to support validity. "Unspecified" = no validity evidence reported.
9. Reliability evidence	Cronbach's alpha; Inter-rater agreement; Conducted but not reported; Unspecified	The procedure(s) reported to support reliability. "Unspecified" = no reliability evidence reported.
10. Statistical techniques	Descriptive statistics; Frequencies / percentages; Chi-square; t-test; ANOVA; Non-parametric tests; Correlation; Regression; …; Unspecified	All analytical techniques were applied to the data. A study may use several techniques.
11. Ethics-committee approval	Reported; Not reported	Whether the article explicitly states that ethics-committee approval was obtained.

***Note**: The form below was adapted from Karadağ (18) and used to code each of the 82 research articles included in the analysis. For each article, the coder recorded the categories listed for each variable; categories not reported in the original article were coded as "unspecified" or "not reported."*
A single article could contribute to more than one category for keywords, research model, data-collection tools, and statistical techniques; therefore, the totals for these variables may exceed 82. Inter-coder agreement across the coded categories was approximately 90%, and discrepancies were resolved by consensus.

To ensure that the categories were applied consistently, operational definitions were established for the principal coding categories before data extraction. In particular, "unspecified" was recorded when an article did not explicitly report the relevant methodological feature (for example, when no sampling technique was named); "no sampling" was recorded when an article studied an entire defined population or a pre-existing intact group (for example, all students in a given cohort) without selecting a subset; and "convenience sampling" was recorded when participants were selected based on accessibility and availability (for example, students

enrolled in the researchers' own faculty) rather than through a probabilistic procedure. The label "convenience sampling" is used here in place of the non-standard term that appeared in an earlier version of the manuscript, in line with conventional research methods terminology.

The coding was performed in two stages to enhance credibility and reliability. The primary researcher coded all 82 articles using the evaluation form. An independent expert in educational research then re-coded the same set of articles using an identical form. Intercoder reliability was quantified using Cohen's kappa coefficient (23), which adjusts the observed agreement between two coders for the agreement expected by chance and is therefore preferred over simple percentage agreement for nominal coding categories. Kappa was calculated separately for each coding category of the evaluation form and then averaged across categories, yielding an overall value of $\kappa = .90$, which corresponds to an almost perfect agreement according to conventional benchmarks (24). The few discrepancies that arose were resolved through discussion and re-examination of the relevant articles until a consensus was reached. The reviewed articles, completed coding forms, and analytical notes were preserved in digital format to support transparency and permit future verification.

Methodological Limitations: Two limitations of this method should be acknowledged. First, the present analysis is constrained by the reporting quality of the original publications; where primary studies did not clearly report a methodological feature, the corresponding entry was coded as "unspecified" or "not reported," which accounts for the relatively high proportion of such entries in several categories. Therefore, these categories reflect deficiencies in the reporting of the original studies rather than the absence of the underlying procedure. Second, restricting the search to ULAKBİM TR Dizin and DergiPark and to the Social Sciences and Health Sciences categories may have excluded relevant Turkish medical education studies published in journals indexed only in other (e.g., international) databases, that predated national indexing, or that appeared in interdisciplinary outlets. Consequently, the corpus may not fully represent the entire output of Turkish medical education research, and the findings should be interpreted as characterizing the nationally indexed, openly accessible literature rather than the field as a whole.

Results

In this study, 82 research articles published in the field of medical education in Turkey between 1997 and 2019 were analyzed using content analysis. The annual number of publications remained low until 2010: only 15 articles (18.3%) were published between 1997 and 2010, and the years 1997, 2002, 2004, and 2009 had minimal representation, with only one article each. From 2011 onwards, the number of publications increased substantially, with 67 articles (81.7%) published between 2011 and 2019 and peaks in 2017 (10 articles, 12.2%), 2018 (12 articles, 14.6%), and 2019 (11 articles, 13.4%). This increase may reflect growing interest in the field; however, it should be interpreted with caution, as it could also be attributable to the broader expansion of journal indexing and database coverage, an overall rise in national publication output, and increasing institutional pressure to publish during this period. Therefore, the trend is best read as consistent with, rather than direct proof of, the consolidation of dedicated research activity in medical education.

The distribution of articles by the number of authors reveals a predominant trend toward collaborative research in the field, with articles authored by two to four individuals accounting for most (44 articles, 53.7%). Specifically, articles with two authors were the most prevalent (n=17, 21%), followed by three-author (n=15, 18.3%), four-author (n=12, 14.6%), six-author (n=11, 13.4%), and five-author articles (n=8, 9.7%). Single-author publications were relatively infrequent (n=5, 6%), suggesting that collaborative efforts are favored in medical education research in Turkey. Higher author counts are even less common; articles with seven or more authors collectively accounted for 14 articles (17.1%), with seven- and eight-author articles appearing four times each (4.9%) and articles with nine to 17 authors represented by only one or two articles each (1.2–2.4%). This co-authorship pattern indicates the collaborative nature of the field, in which multidisciplinary input is advantageous. Research teams in medical education typically consist of a moderate number of contributors rather than large collaborative groups.

A total of 110 keywords were extracted from the 82 reviewed articles. The keywords demonstrate a clear emphasis on "Medical Education," which accounted for over half of all keywords (n=57, 51.8%), indicating that this is the primary focus of the research analyzed in this study. Other prominent keywords, such as "Medical Student" (n=18, 16.3%) and "Pre-Graduation Medical

Education" (n=7, 6.4%), suggest a significant focus on the educational experiences and challenges encountered by students in medical programs. Keywords such as "Faculty of Medicine" and "Medical Profession," each accounting for 4.5% (n=5), indicate attention to institutional and career aspects of the medical field. Notably, topics such as "Intern," "Anatomy," "Anxiety," and "Cigarette" each appeared four times (3.6%), suggesting interest in specific subjects that affect medical education, student well-being, or medical students' health behaviors. The lower frequency of keywords such as "Medical Educator" (n=2, 1.8%) may indicate that studies focusing on the roles and challenges of educators in medical training are relatively rare. Overall, the keyword distribution suggests a primary interest in curriculum- and student-centered issues in medical education research in Turkey. However, the reliance on the broad term "Medical Education" alone impairs search discoverability and bibliographic mapping in international databases, masking specific thematic sub-domains within the literature.

The frequencies and proportions of the research methodologies employed in 82 medical education articles published in Turkey. As some studies used multiple methodologies, the total count exceeded the number of publications. Quantitative research predominated, accounting for 50.5% of methodologies, emphasizing statistical and measurable outcomes. Mixed-methods and qualitative approaches (4.2% and 5.3%, respectively) were less prevalent, suggesting that qualitative insights are pursued less frequently. Retrospective and prospective methods (3.1% and 4.2%, respectively) reflected interest in past practices and future implications. The 13.7% "research model not specified" category highlights many studies with unclear or diverse methodologies, indicating potential gaps in reporting standards (Table 2).

This diversity in methodologies reflects evolving research interests. However, the predominance of quantitative methods suggests a need for increased qualitative and mixed-methods research to capture a broader range of insights into this phenomenon.

The distribution of research articles by sample selection technique. The data indicate that 71.9% of the articles did not specify a sample selection method, potentially suggesting insufficient methodological detail or reliance on convenience samples. This high proportion of "unspecified" entries indicates an opportunity to enhance reporting practices for greater methodological transparency.

Table 2. Distribution of research articles analyzed according to research models

Research Models	n	%
Quantitative	48	50,5
Qualitative (Case Study)	5	5,3
Prospective	4	4,2
Mixed-Methods	4	4,2
Quantitative (Experimental)	3	3,1
Quantitative (Descriptive)	3	3,1
Retrospective	3	3,1
Quantitative (Scale Development)	2	2,1
Program Development and Evaluation	2	2,1
Quantitative (Cross-Sectional Analytical)	2	2,1
Quantitative (Scale Adaptation)	1	1,05
Qualitative (Phenomenological)	1	1,05
Validity-Reliability	1	1,05
Content analysis	1	1,05
Speech Analysis	1	1,05
Historical Review	1	1,05
Research model not specified	13	13,7
Total	95	100

Note. Categories reflect thematic content areas identified across the reviewed literature. Where articles addressed more than one thematic domain, multiple classifications were recorded; consequently, category counts may exceed the total number of articles (N=82) due to multiple classifications. Percentages are based on total thematic instances identified.

Convenience sampling emerged as the most frequently specified technique (13.4%), reflecting many studies' reliance on readily accessible participant groups, such as students enrolled at researchers' institutions. The "No Sampling" category (8.5%) refers to studies that examined an entire defined population or a pre-existing intact group without selecting subsets. More rigorous techniques, such as Purposive Sampling, Stratified Sampling, and Cluster Sampling, were minimally represented (each at 1.2%), indicating that many studies may be descriptive or exploratory, focusing on accessible samples rather than generalizable results. The prevalence of "unspecified" entries underscores the need for enhanced methodological rigor and more explicit reporting standards for sample selection methods in Turkish medical education research (Table 3).

Regarding the sample type (target group), the data indicate a predominant focus on students, who constituted 62 of the 88 reported participant groups (70.5%), demonstrating a significant emphasis on enhancing educational practices and student performance in medical education. Faculty members and intern doctors each represented 3.4% (n=3) of the participant groups, indicating some attention to educators and transitional professionals in the field.

Other subgroups, such as state hospital physicians, assistant doctors in specialization training, and patients, each constituted only 1.1% (n=1), suggesting less frequent examination of broader perspectives among medical professionals in the literature. The 10.2% (n=9) "Unspecified" category indicates occasional ambiguity in defining target groups, highlighting potential areas for improvement in reporting methodologies. Although infrequent, smaller groups, such as health workers and graduates, demonstrate diverse research interests in the field. Because some studies collected data from more than one stakeholder group (e.g., medical students and faculty members concurrently), the total number of participant groups (n=88) exceeds the number of analyzed articles.

Table 3. Distribution of the analyzed research articles based on the sampling technique

Sample Technique	n	%
Unspecified	59	71,9
Convenience Sampling	11	13,4
No Sampling	7	8,5
Purposive Sampling	1	1,2
Stratified and Random Sampling	1	1,2
Stratified	1	1,2
Random	1	1,2
Cluster Sampling	1	1,2
Total	82	100

Note. N=82. Unspecified denotes articles that did not explicitly describe the sampling frame, participant recruitment strategy, or selection rationale. No Sampling indicates studies conducted on an entire census/intact target cohort without a distinct sub-sampling procedure. Percentages may not sum to 100.0% due to rounding.

A critical methodological vulnerability identified in this review is that 71.9% of the published articles failed to report a clear sampling technique (Table 3). Coupled with the finding that 70.5% of studies rely exclusively on undergraduate medical students, the Turkish medical education literature exhibits a heavy structural dependence on convenience samples of captive student audiences. This pervasive omission limits both the external validity of individual studies and national-level generalizability.

The data collection techniques used in the research articles (n=105 instrument mentions across the 82 articles, as many studies used more than one technique) demonstrate a significant reliance on surveys (n=44, 42%) and scales (n=21, 20%), which together account for over 60% of the methodologies employed. This trend indicates a strong inclination toward quantitative methods, enabling researchers to gather standardized data that are suitable for statistical analysis. Such emphasis is prevalent in medical education, where objective measures of educational outcomes and student performance are frequently prioritized. Document Analysis (n=10, 9.5%) and interviews (n=8, 7.6%) were also employed, indicating that some studies incorporated qualitative elements. This balance acknowledges the need to capture more nuanced insights alongside quantitative data, although qualitative methods need to be more prevalent. The lower frequency of techniques such as feedback (n=6, 5.7%) and Program Review (n=2, 1.9%) suggests that, while collecting subjective opinions and evaluations is valued, other approaches are used in most studies. Utilizing specialized methods, including Writing Metaphor, Verbal and Non-Verbal Communication Techniques, and the Kolb Learning Style Model, indicates a diversity of techniques, albeit each with minimal application (each n=1, 0.95%). The Unspecified category (n=4, 3.8%) indicates that a small proportion of studies did not clearly define their data collection methods, highlighting the need for enhanced methodological reporting practices in the field.

The distribution of articles analyzed in this study, categorized by the validity assessments conducted, is shown in Table 4. These assessments reveal a significant need to report valid methodologies. Notably, 85% of the studies were classified as unspecified, indicating that researchers often needed to include documentation on whether and how validity was assessed. This lack of transparency may compromise the credibility and reliability of their findings, underscoring the necessity of comprehensive reporting in scholarly work. Among the studies in which validity was assessed, only a small proportion used established statistical methods, such as Exploratory Factor Analysis (4.6%) and Confirmatory Factor Analysis (2.4%). These methods are essential for assessing construct validity, yet few studies have employed rigorous statistical validation procedures. Furthermore, validity was assessed (5.9 %), but no findings were reported, suggesting that although some researchers attempted validity assessments, they encountered challenges that impeded successful validation. The remaining specific methods for validity assessment, such as Item Discrimination and Two-Level Confirmatory Factor Analysis, each appearing once (1.1%), indicate the limited utilization of advanced statistical approaches in the analyzed articles.

The distribution of articles analyzed by reliability assessment. The findings revealed significant ambiguity

in reporting reliability, with 80.5% of the studies categorized as unspecified, indicating inadequate documentation of reliability evaluation. This lack of transparency raises concerns regarding the reliability of the instruments and the credibility of the research findings. Among the studies that reported Reliability, Cronbach's alpha was the most frequently utilized method, appearing in 14.6% of the articles. This measure, widely accepted for assessing internal consistency, indicates the researchers' efforts to ensure instrument reliability. However, the relatively low percentage suggests that many studies require more rigorous reliability testing. Categories such as Reliability were performed but not found (2.4%), and the Reliability = Agreement / (Agreement + Disagreement) formula (2.4%) indicates that some researchers attempted reliability evaluations. However, the results were either unfavorable or not reported. These efforts reflect an awareness of reliability testing but underscore the challenges in achieving or effectively reporting satisfactory results (Table 4).

Table 4. Distribution of research articles analyzed in the study based on validity and reliability assessments

Validity Studies	**n**	**%**
Unspecified	72	85
Validity has been conducted, but no findings were found	5	5,9
Exploratory Factor Analysis (EFA)	4	4,6
Confirmatory Factor Analysis (CFA)	2	2,4
Item Discrimination Coefficients	2	2,2
Total	85	100
Reliability Studies	**n**	**%**
Unspecified	66	80,5
Cronbach's Alpha	12	14,6
Reliability has been performed but not found	2	2,4
Reliability = Agreement / (Agreement + Disagreement) Formula	2	2,4
Total	82	100

Note. *Validity: n=85 reported instances across N=82 articles; percentages are calculated based on total reported instances (n=85). Reliability: N=82; percentages are based on N=82. Unspecified indicates studies with no documented validation procedures or no internal consistency, test–retest, or inter-rater reliability coefficients for the instruments employed. Conducted/performed but not found refers to studies stating that validity or reliability was evaluated but omitting the results. EFA = Exploratory Factor Analysis; CFA = Confirmatory Factor Analysis.*

The distribution of the statistical techniques used in the research articles is presented in Table 5. These techniques reveal a variety of methods used for data analysis. Descriptive Statistics (25.1%) and Number and Percentage (21.5%) were the most prevalent, accounting for nearly half of the techniques employed. This indicates a primary focus on summarizing and presenting data, which is essential for the initial analysis but suggests a reliance on basic rather than advanced statistics. Chi-square tests (12.3%) and t-tests (9.1%) indicate the use of standard inferential techniques for testing hypotheses related to categorical and continuous variables. Non-parametric tests, such as the Mann-Whitney U (5.4%) and Kruskal-Wallis (2.7%) tests, demonstrated an understanding of data distributions that failed to meet the assumptions of parametric tests.

The limited use of more complex techniques, such as ANOVA (1.8%) and regression analyses (each at 0.5%), suggests a gap in exploring multifactorial relationships in the data. This infrequency may indicate a need for additional expertise or a focus on simpler analyses. The Unspecified category (6.0%) revealed that some articles did not document statistical methods, potentially affecting their reproducibility and credibility. Although there is a strong foundation of statistical methods, there is potential for growth in the utilization of more sophisticated analyses. Encouraging the use and reporting of advanced techniques could enhance the depth and quality of research findings in medical education.

Table 5. Distribution of research articles analyzed by statistical techniques used

Statistical Techniques Used	**n**	**%**
Descriptive Statistics	55	25,1
Number and Percentage	47	21,5
Chi-Square	27	12,3
T-Test	20	9,1
Mann-Whitney U	12	5,4
Kruskal-Wallis Test	6	2,7
One-Way ANOVA	5	2,3
ANOVA	4	1,8
Spearman Correlation Analysis	3	1,4
Pearson Correlation Analysis	3	1,4
Tukey HSD as Post Hoc Test	3	1,4
Variance	3	1,4
Correlation and Correlation Coefficients	3	1,4
Kolmogorov-Smirnov Test	2	0,9
ANCOVA	1	0,5
One-way Analysis of Variance	1	0,5
Pearson Chi-Square test	1	0,5
Bonferroni Correction Test	1	0,5
Shapiro Wilk Test	1	0,5
Wilcoxon Test	1	0,5
Friedman Test	1	0,5
Dunn's Multiple Comparison Analysis	1	0,5
Distribution Statistics	1	0,5

Statistical Techniques Used	n	%
Reliability Coefficients	1	0,5
Item Difficulty Index	1	0,5
Item Total Test Coefficients (Pairwise Correlation)	1	0,5
Regression Analysis	1	0,5
Unspecified	13	6,0
Total	219	100

Note. *Total statistical techniques recorded n=219 across N=82 articles. Total occurrences exceed the sample size because individual studies typically utilized multiple descriptive and inferential tests. Percentages are calculated relative to total reported analytical procedures (n=219). ANOVA = Analysis of Variance; ANCOVA = Analysis of Covariance; HSD = Honestly Significant Difference.*

Discussion

The development of medical education as an academic field in Turkey appears to be closely linked to the institutionalization of the Departments of Medical Education. The establishment of these departments, beginning at Ege University in 1999 and followed by other major universities, seems to have contributed to the visible increase in both research and review publications in subsequent years (2). This trend suggests that the expansion of academic structures in the field has supported both scholarly productivity and the professionalization of medical education research in Turkey. This association should nevertheless be interpreted cautiously, as the rise in publications may also reflect the broader expansion of database indexing and an overall increase in national publication output, rather than disciplinary consolidation alone.

The findings also indicate that medical education research in Turkey has grown quantitatively, although several methodological limitations persist. Similar to earlier evaluations in the broader field of educational sciences, the present review shows that problems related to research design, sampling, and the reporting of validity and reliability continue to affect publication quality (10, 18). In this respect, the methodological challenges observed in educational research appear to persist in medical education.

One of the most notable findings was methodological transparency. In many studies, essential features such as the research model, sampling strategy, sample size, and validity or reliability procedures were either insufficiently reported or not reported at all. This weakens reproducibility and makes it difficult to evaluate the rigor of the reported findings. In particular, the frequent absence of clearly defined sampling procedures suggests that many studies relied on accessible participant groups without adequately justifying their representativeness of the population. This issue limits the generalizability of the findings and narrows the empirical base of this field.

Another important pattern is the dominance of quantitative research design. This finding is consistent with previous research on trends in medical education in Turkey (14). While quantitative approaches are valuable and often more practical to implement, the limited use of qualitative and mixed-methods designs may restrict a deeper understanding of complex educational processes. Greater methodological diversity would allow researchers to examine not only measurable outcomes but also the experiences, meanings, and contextual factors that shape medical education practices.

Similarly, although a wide range of statistical procedures were identified, the analyses were largely limited to descriptive and basic inferential techniques. This suggests that many studies remain at a relatively descriptive stage. Depending on the research problem, more advanced, multivariate analyses may strengthen explanatory power and improve the overall contribution of future studies (18).

The findings related to ethics approval also indicate an important shift in the study over time. More recent studies appear to demonstrate greater awareness of ethical reporting requirements, whereas many earlier studies either did not obtain or report ethics committee approvals. This may reflect broader changes in publication standards and research governance. Therefore, the increased visibility of ethical procedures in recent years can be interpreted as a positive indicator of methodological maturation in this field. This aggregate figure should nonetheless be interpreted in light of the study design, as expectations regarding ethics committee approval vary across designs; survey-based and interventional studies involving human participants typically require formal approval, whereas document-based or retrospective analyses may be subject to different requirements. Accordingly, the proportion of studies that did not report ethics approval partly reflects the mix of designs in the corpus. It should not be read as uniformly indicating a lapse in ethical conduct in all studies.

These methodological patterns are not unique to the Turkish medical education research. Incomplete reporting of sampling procedures, validity and reliability evidence, and research designs has been documented as a recurring concern in education and health professions research more broadly, and reporting quality and content analysis studies conducted in other settings have

reached broadly similar conclusions. Viewed in this light, the deficiencies identified here are better understood as part of a wider international challenge in the reporting of empirical research than as a problem specific to Turkey. This comparative perspective also suggests that improvements in reporting standards, peer review expectations, and methodological training—rather than measures confined to a single national context—are likely required to address them.

Overall, this review suggests that medical education research in Turkey has shown clear progress, particularly in publication volume, institutional support, and reporting quality in recent years. However, persistent shortcomings in methodological reporting, sampling practices, and diversity in research designs indicate that further development is necessary. Strengthening methodological rigor and reporting standards will improve the quality, reproducibility, and cumulative value of future studies in this area.

Conclusion

This descriptive content analysis examined the thematic and methodological characteristics of research articles published in the field of medical education in Turkey. The findings show that the field has expanded over time and has become increasingly institutionalized, particularly with the development of Departments of Medical Education. This growth reflects the rising scholarly interest in medical education and a stronger academic foundation for the field in Turkey.

Simultaneously, the analysis identified several recurring methodological weaknesses, including limited diversity in research designs, insufficient reporting of sampling procedures, weak documentation of validity and reliability processes, and incomplete methodological descriptions in many studies. These issues reduce transparency, limit reproducibility, and constrain the interpretability of the evidence base.

Despite these limitations, the overall pattern suggests gradual improvement in recent years. More recent publications appear to provide clearer methodological information and reflect greater attention to ethical and scientific standards than older publications. Future studies in medical education should prioritize stronger methodological reporting, greater use of diverse research designs, and more rigorous sampling and analytical procedures. Such improvements would not only enhance the quality of individual studies but also strengthen the cumulative development of medical education research in the country.

Furthermore, this study was limited to publications indexed in two national databases, namely ULAKBim TR Dizin and DergiPark. Consequently, medical education articles published by Turkish researchers in international databases such as Scopus, Web of Science, or PubMed that were not indexed in these two national repositories were excluded, which should be considered when generalizing the findings.

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Ethical approval: This study analyzed publicly available, published articles and involved no human participants or identifiable personal data. Ethics committee approval and informed consent were therefore not required. The study was conducted in accordance with the ethical principles of the Declaration of Helsinki, where applicable.

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Data Availability: The datasets (completed coding forms) generated and analyzed during the current study are available from the corresponding author upon reasonable request.

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