ORIGINAL ARTICLE

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Predictors for Publication of Specialty Theses in the Field of Infectious Diseases and Clinical Microbiology

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ABSTRACT

Objective: Specialty theses in the field of infectious diseases and clinical microbiology (IDCM) play an important role in shaping medical knowledge, yet their publication in scientific journals remains a critical concern. We reviewed the theses of the IDCM specialty program, analyzed the publication rates in scientific journals, and made some recommendations for the future.

Materials and Methods: We analyzed the registered IDCM theses in the electronic database of the Council of Higher Education (YÖK, Ankara) between 1984 and 2021. Specialty theses from other medical fields, PhD and master theses, were excluded from the study.

Results: Out of 1265 theses, 1061 were included after exclusion criteria were applied. The study revealed that 647 (61%) of residents were female. Of 1061 authors, 117 (11%) received financial support during the preparation of the thesis. The most common thesis topics were viral hepatitis, healthcare-associated infections, antibiotic susceptibility, zoonotic diseases, febrile neutropenia, and sepsis. The predominant type of study design was observational (88%). Notably, 27 (3%) were randomized controlled trials. The overall rate of publication in a peer-reviewed journal was 25%. Nonetheless, 117 (11%) theses were published in the journals indexed in the Science Citation Index (SCI) or the Science Citation Index-Expanded (SCI-E). The median time from the presentation of theses to publication was four years.

Conclusion: The publication rate of specialty theses in scientific journals in the field of IDCM was found to be low. Publication of the thesis as a scientific manuscript should be a part of the residency program and the completion process of the thesis. All the residents or young specialists should be encouraged to submit their theses for publication.

Keywords: specialty, theses, publications

INTRODUCTION

The residency program of infectious diseases and clinical microbiology (IDCM) in Türkiye was started in 1983 by adopting the name IDCM. The IDCM program in Türkiye is a five-year program, including related clinical rotations. Presenting a thesis at the end of this program is mandatory. The first specialty thesis in the field of IDCM was presented in 1984 (1). Although presenting a specialty thesis is an obligation in Türkiye, publishing it as a scientific manuscript in indexed journals is not mandatory. All theses included in our study were recorded in the repository of the Higher Education Council (in Turkish YÖK) of Türkiye (https://tez.yok.gov.tr/UlusalTezMerkezi); however, only a small proportion of them were published in scientific journals. The publication of theses in scientific journals enhances their visibility and, as a result, increases the accessibility of the conducted research and dissemination of the findings (2). The studies from different fields of medicine reported that the publication rates of Turkish medical theses in scientific journals were less than 20% (3-5). We reviewed the specialty theses produced in the field of IDCM, analyzed the rate of publication in scientific journals, and determined the parameters for their publication. We aimed to provide tips to improve their chances of being published.

HIGHLIGHTS

- The publication rate of infectious diseases and clinical microbiology (IDCM) specialty thesis is very low; we found 25% overall and only 11% in SCI journals.
- The publication rate of the theses with animal experiments and including multivariate analysis independently was higher.
- The publication duration of the theses in the Science Citation Index (SCI) was shorter than the ones published in non-SCI journals.
- Publication of theses as a scientific manuscript should be a part of the residency program and completion process.
- All residents or young specialists should be encouraged to prepare and submit their theses for publication.

Table 1. Parameters for publishing the thesis.

	OR	95% CI	*p*
Multivariate analysis	1.789592	1.166352-2.74586	**0.008**
Animal experiment	5.042701	2.337607-10.87815	**<0.001**

OR: Odds ratio, **CI:** Confidence interval.

MATERIALS AND METHODS

We searched the database of the Council of Higher Education (YÖK, Ankara), where all specialization and doctorate theses have to be recorded. We reviewed all registered theses in the field of IDCM at the interval of 1984 and 2021. A total of 1265 theses on IDCM were detected in the system. Specialty theses from other medical fields, PhD and master theses, were excluded. Theses not registered in the YÖK National Thesis Center could not be accessed, and those which provided insufficient data were not included in the study. Google Scholar, PubMed, and TÜBİTAK ULAKBİM TR Dizin databases were searched for the theses' publication status using the author names and the names of the theses in both English and Turkish. We searched the Web of Science database for the published thesis to see the journal's impact factor in the publication year.

Statistical analysis of the data was conducted using Stata statistical software 11.0 (StataCorp, USA). For categorical variables, the Chi-square test was used; for continuous variables, the t-test was used. The statistical significance was set as 5%.

RESULTS

Out of 1265 theses, 1061 were included (Figure 1). Publication rates of 1061 theses by the years and their indexing were presented in Figure 2 and Figure 3. Out of 1061 theses, 647 (61%) were female. In total, 117 individuals (11%) stated that they received financial support for their thesis. The highest number of theses were produced in rank at Health Sciences University and Republic of Türkiye Ministry of Health Training and Research Hospitals, İstanbul University, and Ankara University.

Viral hepatitis 221 (21%), healthcare-associated infections 174 (16%), antibiotic susceptibility 119 (11%), zoonotic diseases, primarily brucellosis 98 (9%), febrile neutropenia 26 (2.5%), and sepsis 23 (2%) were the most studied topics. In terms of research methods, 60% of the theses were prospective, and 40% were retrospective. Of 1061 theses, 933 (88%) were observational studies, more common than interventional studies. We found that 26 (2.5%) of the studies were randomized controlled trials, 70 (7%) were field studies, 50 (5%) were survey studies, and 31 (3%) were animal experiments.

Statistical tests were performed in 947 (89%) of theses; among them, multivariate analysis was performed in 326 (31%) and univariate analysis in 644 (61%). The mean of the sample size in theses was calculated as 265, and the median was 110 (3/8700). We observed that 69 (7%) of them had determined the sample size before the study, but only 27 (3%) reached the target sample size.

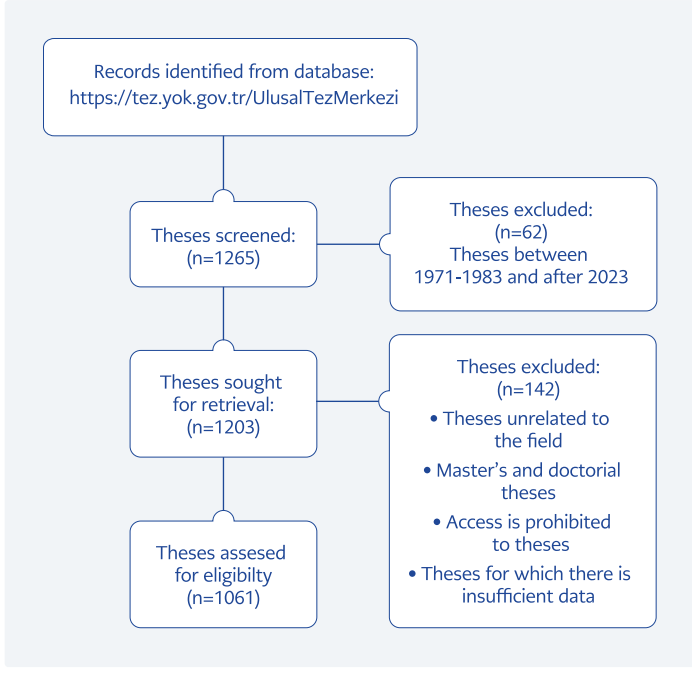

Figure 1. Flowchart of study design.

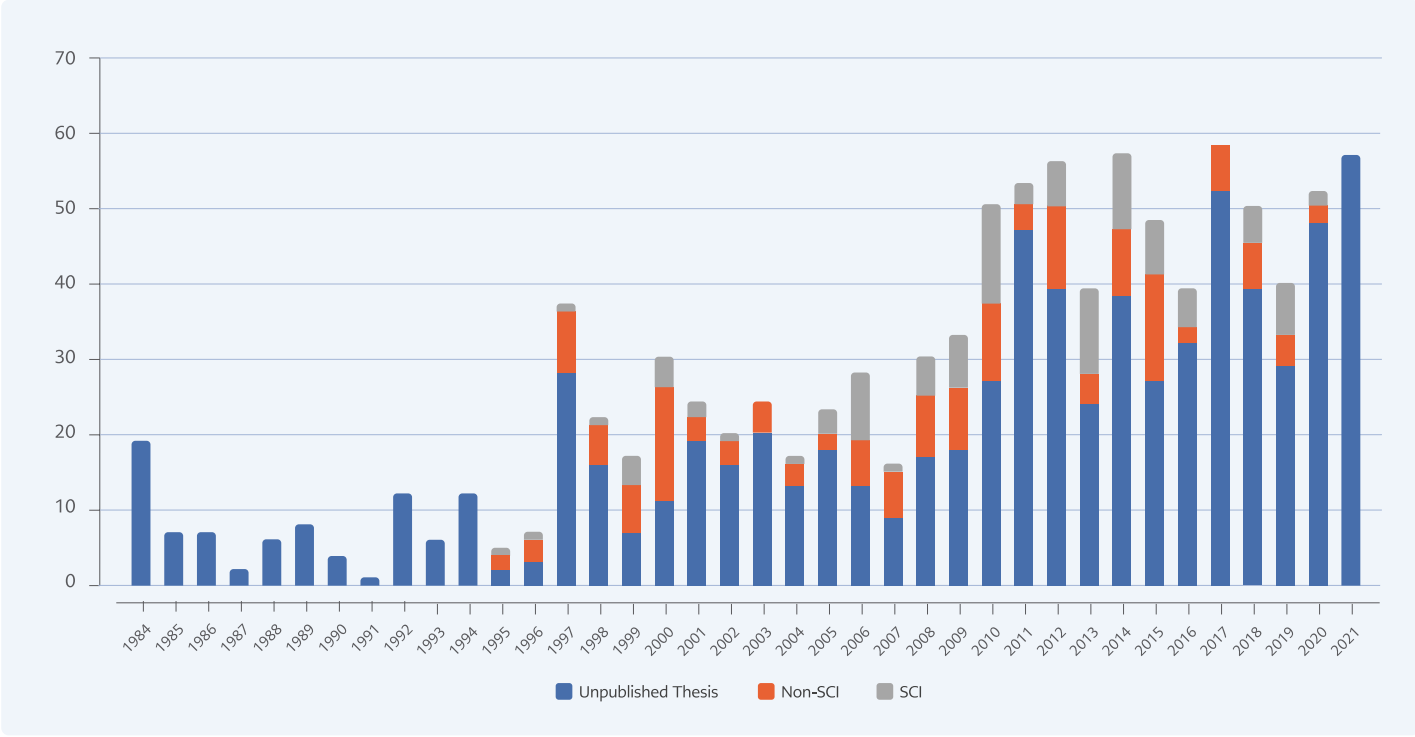

Figure 2. Publication rates of the specialty thesis in the Science Citation Index (SCI) by years.

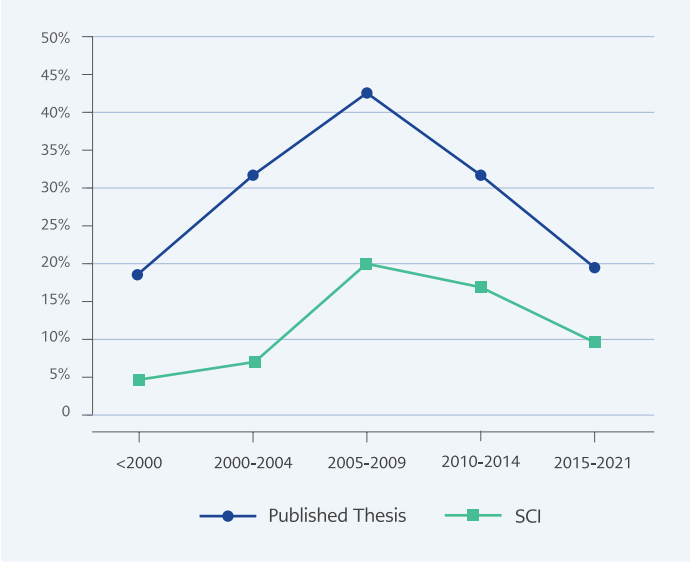

Figure 3. Publication rates of theses in the journals and the sub-group of the ones indexed in SCI between 2000 and 2021.

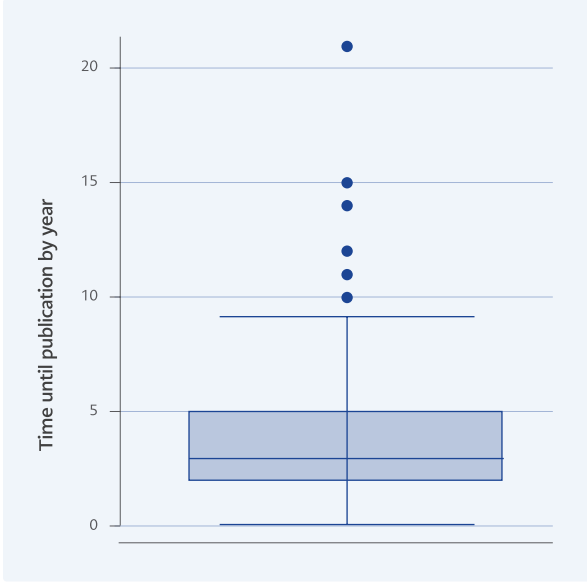

Figure 4. Duration (years) between the presentation and publication of theses.

Of theses, 271 (25%) were published in a scientific journal. The average duration from the completion of the thesis to publication was calculated as four years. Among the published theses, the duration from presentation to publication in the journals indexed in the Science Citation Index (SCI) was 3.3 years (standard deviation [SD]=2), and it was 4.4 years (SD=3.7) in non-SCI journals (p=0.004) (Figure 4).

Table 2. Multivariate analysis in predictors of publication in SCI-E journals.

	Theses, n=1061 n (%)	Published, n=271 n (%)	*p*1	Indexed in SCI-E, n=117 n (%)	*p*2
Female gender	647 (60)	161 (60)	0.524	70 (60)	0.776
Financial support	117 (11)	26 (10)	0.37614	14 (12)	0.737
Clinical trial	727 (67)	187 (69)	0.884	82 (70)	0.723
Laboratory trial	670 (63)	177 (65)	0.405	78 (67)	0.411
Molecular techniques	170 (16)	34 (13)	0.069	12 (10)	0.071
Prospective study	642 (60)	175 (65)	0.235	80 (68)	0.107
Questionnaire study	50 (5)	13 (5)	0.943	4 (3)	0.483
Observational study	933 (88)	237 (87)	0.702	97 (83)	0.066
Interventional study	32 (3)	7 (3)	0.627	5 (4)	0.4
Field study	70 (7)	21 (8)	0.379	8 (7)	0.914
Randomized clinical trials	26 (3)	7 (3)	0.872	4 (3)	0.474
Animal experiments	31 (3)	13 (5)	**0.034**	11 (10)	**<0.001**
Univariate analysis	912 (86)	232 (86)	0.813	106 (91)	0.131
Multivariate analysis	229 (22)	63 (23)	0.446	36 (31)	**0.011**
Pre-calculated sample size	69 (7)	21 (8)	0.340	8 (7)	0.881

The findings of our multivariate analysis showed that the publication rate of theses, including animal experiments and multivariate statistical analysis, was significantly increased (Table 1). Further analysis revealed that financial support ($p<0.001$) plays a significant role in animal experimentation. Sixty per cent of the randomized controlled trials were animal experiments; because of such a collinearity, randomized controlled trials were excluded from the analysis. Table 2 shows the publication rates of theses according to study design in Science Citation Index-Expanded (SCI-E) journals.

Only 117 (11%) theses were published in journals indexed in SCI-E, and the impact factors of the journals were less than 3, except for two theses. The majority of the theses were published in journals with low-impact factors. The top three preferred journals were FLORA Journal, Microbiology Bulletin, and KLİMİK Journal.

DISCUSSION

The results presented in this study shed light on the current state of thesis publication rates and their impact within the field of IDCM. The overall publication rate was %25, and the publication rate in SCI-E journals was 11%. Our findings suggested that the publication rate increases in planned and well-designed theses. In addition, there is a need for improvement in transforming medical theses into published scientific articles.

There was a significant acceleration in the publication rate of theses between 2000 and 2005 (Figure 3). This acceleration was believed to be related to the "Associate Professorship Examination Regulation" published in the Official Gazette dated September 1, 2000, and numbered 24,157. With this regulation, the requirement for international publication gained broader validity, the minimum number of publications changed in all scientific fields, and the requirement for jour-

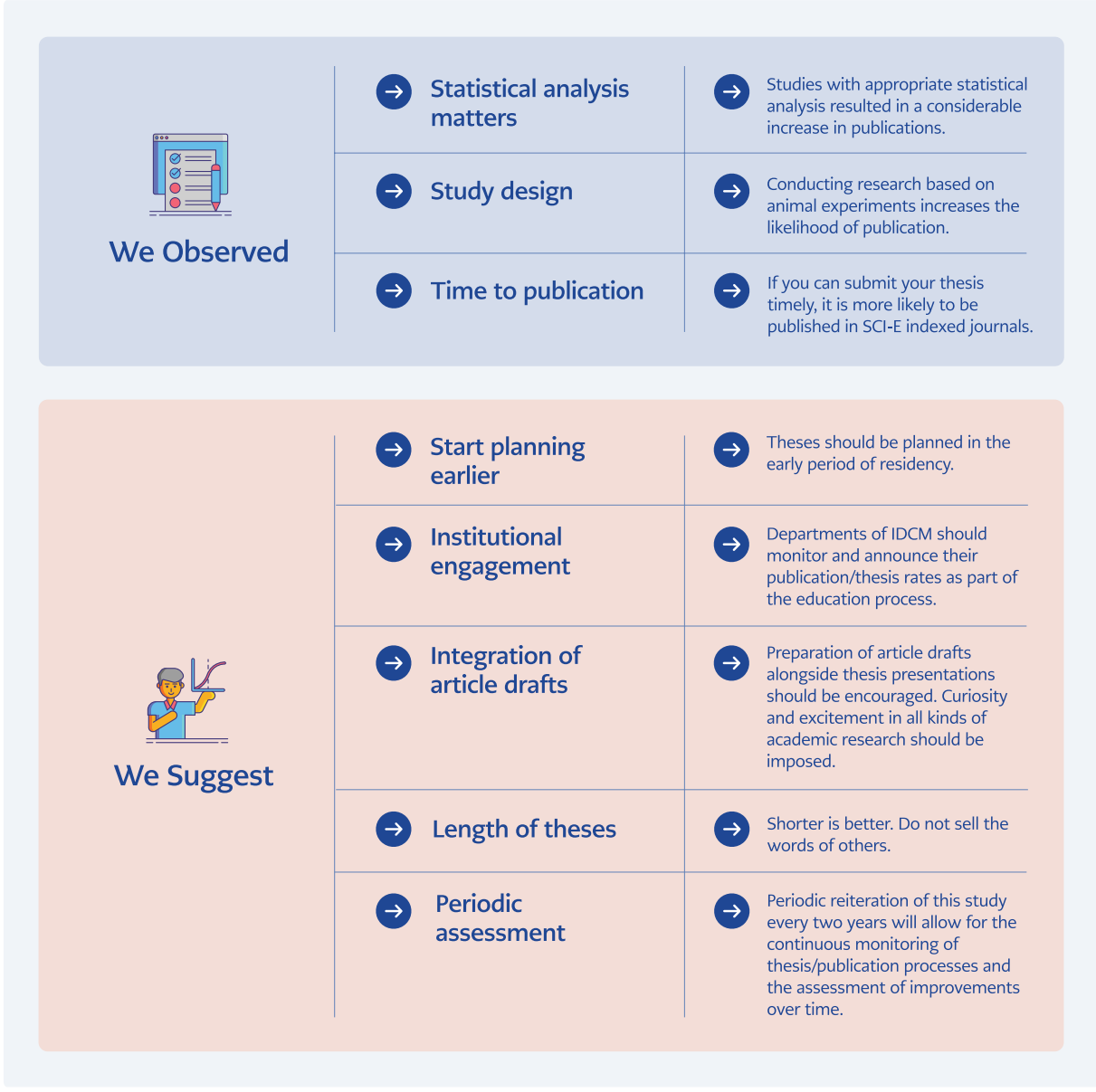

Figure 5. Recommendations based on our results.

nals scanned by SCI-E / Social Sciences Citation Index / Arts and Humanities Citation Index became mandatory. As a result, the publication rate of generally conducted publications in Türkiye increased from 65% to 75%. However, after 2005, there was a slight decline in the quantity of publications (6).

According to a previous study from Türkiye that evaluated the theses in the field of IDCM, including both specialty and dissertation theses, 11.4% of a total of 824 theses conducted in the fields of medical microbiology, clinical microbiology, and infectious diseases between 1997 and 2007 were published internationally. Among those, 13.7% (34/249) of doctorate dissertation theses, 10.7% (33/309) of microbiology and clinical microbiology specialization theses, and 10.2% (27/266) of IDCM specialization theses were published (3). In a recent study in the field of general surgery, 1996 theses were reviewed between 1998 and 2018. It was reported that 393 (20.5%) of the theses were published in a journal, with 288 (14.4%) published in a journal indexed

in SCI/SCI-E (4). In another study including overall fields, Ozgen et al. (5) reviewed 22,625 specialty theses between 1980 and 2005; they reported that only 1397 (6.2%) of medical theses were published in indexed journals, with a median citation of 0.3-5.

One significant observation is that the impact factors of the published journals are generally low. This raises questions about the visibility and influence of the research conducted through theses, as the impact factor of a journal is often indicative of its reach within the scientific community. It highlights the need for strategically selecting journals and focusing on journals with higher impact factors to maximize the dissemination and recognition of research outcomes.

In a study conducted in France, one of the countries where the medical specialization thesis is required, 185 individuals who specialized in medical oncology training between 2010 and 2015 were included. The average impact factor of the published journals was 5.71, and the publication rate for the journals listed in Medline was 29.7%. It was discovered that the topic of the thesis and its publication were related. The thesis was classified as clinical research when published in journals with a high impact factor (7).

The primary objective of this study has been to prepare a comprehensive situation report and offer recommendations on behalf of our association. In Figure 5, we attempted to list the possible solutions and proposals for accelerating the publication of theses. By implementing these recommendations, we can not only enhance the scientific impact of thesis research but also contribute to the advancement of knowledge in the field.

The aim is to enhance the quality of scientific results and publications stemming from theses. To achieve this, it is crucial to instill a mindset that considers the potential for publication right from the design stage of the thesis. There are urgent tasks for individual residents, professors, institutions, and the government. The publication of theses in scientific journals should be encouraged at all levels. Otherwise, the enormous effort given to preparing theses will not be visible.

Our study has several limitations. Firstly, we applied a single database (https://tez.yok.gov.tr/UlusalTezMerkezi) as the primary source. This situation caused limited access to data if the thesis owner did not give full access permission and there was missing information in the abstract of some theses. Additionally, we detected that some theses from the hospitals from the Republic of Türkiye Ministry of Health were not recorded in the database, therefore the total number of all theses is more than the number of theses analyzed in this study.

The medical specialty theses should be prepared as scientific manuscripts to be disseminated in an international scientific environment. The residents of IDCM put a great effort into presenting a specialty thesis; however, the publication rate of their theses in scientific journals is very low. Publication of theses as a scientific manuscript should be a part of the residency program and completion process of theses. All the residents or young specialists should be encouraged to prepare and submit their theses for publication.

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Informed Consent: N.A.

Peer-review: Externally peer-reviewed

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Conflict of Interest: The authors declare no conflict of interest.

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