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An analysis of orthopaedic theses in Turkey: Evidence levels and publication rates

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ABSTRACT

Background: The aim of this study was to present characteristics and publication patterns of studies arise from orthopedic theses obtained from National Thesis Center; database in terms of publication years, study types, topics, level of evidence between 1974 and 2014.

Methods: Firstly, National Thesis Center database was searched for orthopedics and Traumatology theses. The theses, which their summary or full text were available were included in the study. The topics, study types and quality of study designs were reviewed. Then theses were searched in the PubMed database. Journals of published theses were classified according to category, scope and impact factors of the year 2014.

Results: 1508 theses were included into the study. Clinical studies comprised 71,7% of the theses, while 25,6% of the theses were non-clinical experimental and 2,7% of the theses were observational studies. Clinical studies were Level I in 8,6% (n = 93) and Level II in 5,8% of the theses (n = 63). A total of 224 theses (14,9%) were published in the journals indexed in PubMed database from 1974 to 2012. Fifty-two (23,2%) were published in SCI; 136 theses (60,7%) were published in SCI-E journals and 36 theses (16%) were published in other Journals indexed in PubMed.

Conclusion: The quantity and quality of published theses need to be improved and effective measures should be taken to promote quality of theses. Theses from universities and Training hospitals which did not allow open access, and; incomplete records of the National Thesis Center database were major limitations of this study.

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Introduction

A thesis is the first scientific step of a postgraduate student. Publication of a thesis as a scientific article in the final makes the thesis worthy.¹ Also scientific activity of institutions or universities can be measured by amount of publications, impact factors of the journals, and amount of citations.²

A thesis is a critical component of postgraduate residency program in Turkey. Thesis preparation requires much time and effort and brings understanding of the scientific literature as well as the ability to independently and analytically think. A thesis prepared at

the end of residency program is accepted as a 'Master's thesis' in Turkey. However the last two years of medical education is also accepted as a postgraduate programme in a non-thesis form, but it is not possible to go on to a doctorate degree. In order to avoid the loss of effort and time, it is important to publish thesis in a significant journal.

The aim of this study was to present characteristics and publication patterns of studies arise from orthopedic theses obtained from National Thesis Center database in terms of publication years, study types, topics, level of evidence between the years 1974 and 2014.

Methods

In the first phase, the National Thesis Center database was searched for articles related to orthopedics and traumatology

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between the years of 1974–2014. Unfortunately these from universities and training hospitals of Health Ministry which did not allow open access to theses from their departments, and incomplete records in the National Thesis Center database limits this study. The search results included a summary or the full text of the publications. Two independent researchers conducted analysis with disagreements resolved by discussion or a third one. These were evaluated according to years, study types, and topics. Topics of theses were categorized into 10 main subheadings; trauma, pediatrics, sports-arthroscopy, adult reconstruction (knee, hip, ankle), spine, tumor (tumor, metabolic diseases, AVN, infection), hand-wrist, foot-ankle, shoulder-elbow and miscellaneous (basic science, practice management, osteoarthritis and other issues). Research methodologies were grouped under three main headings to include clinical, non-clinical experimental and observational. Clinical study designs were classified based on the American Academy of Orthopedic Surgeons' Levels of Evidence and Grades of Recommendations System.³ Level I studies consisted of high-quality randomized controlled trials, while Level II studies consisted of lesser-quality randomized controlled trials and prospective comparative studies. Level III studies were made up of case-control and retrospective comparative studies and Level IV was composed of case series with no controls. Non-clinical experimental studies were grouped under five main headings - animal research, cell culture (*in vitro* tests), biomechanical, cadaveric and movement analysis.

In the second phase, theses were searched for in the PubMed database. All theses were evaluated and checked for potential matches with a specific thesis. Journals of published theses were classified according to category, scope and impact factor of the year 2014. Journal citation reports of the ISI web of knowledge and National Library of Medicine^{4,5} were used for journals scope and impact factor. Distribution of published thesis by year of publication and annual rates of increase and decrease were described with separate tables and graphs.

Thesis owners were also searched on the web with respect to their credentials. Those credentials were also confirmed on the website of their respective institutions. All thesis owners with the appropriate academic degrees were considered academicians. The mean publication numbers of academicians and non-academicians in the PubMed database were also determined.

All data was transferred to Microsoft Excel and analyzed using SPSS 15.0. Descriptive analysis was primarily used. The clinical data were presented as number, percent and mean. The distributions of data were subject to certain year intervals.

Results

Search results accounted for 1520 theses between the years 1974 and 2014. The abstract or full text of 12 theses could not be accessed, so they were excluded from the study, leaving 1508 theses that had an accessible abstract or full text (full text: 573 (38%); abstract: 935 (62%)). The number of theses demonstrated an increasing trend according to years (see Fig. 1). 71,7% (n = 1081) of the theses were clinical, 25,6% (n = 386) were non-clinical experimental and 2,7% (n = 41) were of observational study designs. Distribution of the study designs according to years is exhibited in Fig. 2. Non-clinical experimental studies showed an increase during 2006–2010 and, subsequently, a rapid drop from 2011 to 2014. 8,6% (n = 93) of the clinical studies were Level I, 5,8% (n = 63) were Level II, 12,9% (n = 139) were Level III and 62,1% (n = 669) were Level IV based on the American Academy of Orthopedic Surgeons' Levels of Evidence and Grades of Recommendations System. Quality of study

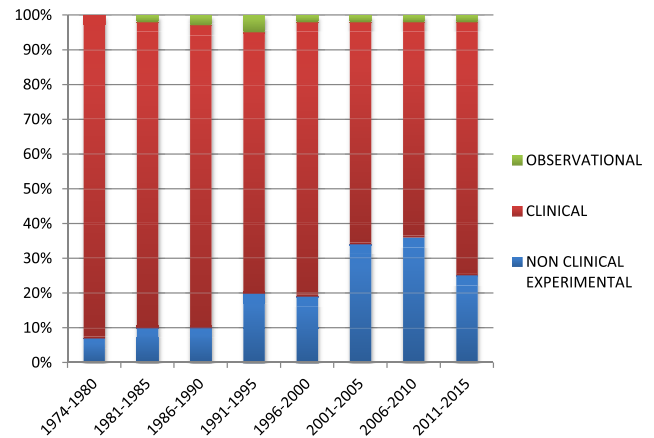


Fig. 1. Study types of theses according to years.

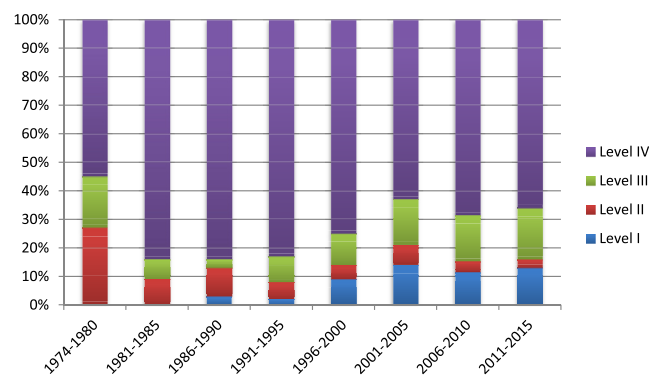


Fig. 2. Quality of study designs of clinical studies.

designs of the clinical studies according to years is described in Fig. 3. Level I studies rose till 2014. Level II studies showed a rapid decrease from 1981 to 1985 and undulation afterwards.

As indicated in Fig. 4, the most common topic was trauma (n = 349, 23,1%), followed by miscellaneous (basic science, practice management, osteoarthritis and rehabilitation medicine) (n = 323, 21,4%) and pediatrics (n = 184, 12,2%).

1394 theses were prepared between the years 1974–2012 and a total of 224 theses (16%) were published in journals indexed in the PubMed database. The years after 2012 were not included because of the fact that getting a citation requires approximately two years after publication. The first published thesis was related to a lower extremity prosthesis, prepared by Halit Özyalçın in 1982, and published in the Journal of Prosthetics and Orthotics International in 1989.⁶ Fig. 5 details the rates of published theses according to years. A rapid increase is seen up to the period between 2001 and 2005, with a slight decrease thereafter. Table 1 shows the distribution of published journal articles in terms of frequency, scope and impact factor. Acta Orthopaedica et Traumatologica Turcica, with 63 published theses (28,1%), and *Knee Surg Sports Traumatol Arthroscopic* and *Eklemler Hastalıkları Cerrahisi* (Joint Diseases And Related Surgery), with 15 published theses (6,7%), were the most preferred journals. 52 theses (23,2%) were published in SCI, 136 theses (60,7%) were published in SCI-E journals and 36 theses (16%) were published in other journals indexed in the PubMed database. Distribution of published theses according to journal scope and years is shown in Fig. 6. Following a dramatic rise in publications

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