**ARAŞTIRMA / *Research Articles***

# Bibliometric Analysis Of Theses On Drug Adherence Conducted in Turkey

## *Türkiye'de Yapılan İlaç Uyumu Konulu Tezlerin Bibliyometrik Analizi*

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### *ABSTRACT*

***Objective:*** *The aim is to systematically review postgraduate theses on medication adherence in Turkey.*
***Materials and Methods:*** *A search was conducted in the National Thesis Center of the Council of Higher Education (YÖK) between June 17-29, 2024, using the terms "medication," "adherence," and "medication adherence."*
***Results:*** *A total of 1099 theses were identified, and 367 were included based on their titles, abstracts, and content. Excluding 35 theses with restricted access, 332 theses were analyzed bibliometrically. Of these, 96.4% focused on adults, while 3.6% addressed pediatric populations, with a noticeable increase in pediatric studies over the past five years. Master's theses (44.6%) and medical specialty theses (43.1%) made up the majority. The most common keyword was "adherence" (46.4%), and the "Morisky Treatment/Medication Adherence Scales" (17.4% - 17.3%) were the most frequently used tools.*
***Conclusion:*** *Clarifying adherence-related concepts and developing specific measurement tools tailored to populations and diseases are essential. This study may guide future research.*


***Keywords:*** *Drug, Adherence, Drug Adherence, Drug Compliance, Compliance*


### *ÖZ*

***Amaç:*** *Türkiye'de ilaç uyumu konusunda yapılan lisansüstü tezlerin sistematik olarak incelenmesidir.*
***Gereç ve Yöntem:*** *YÖK Ulusal Tez Merkezi'nde "ilaç", "uyum", "ilaç uyumu" terimleriyle 17-29 Haziran 2024 tarihleri arasında tarama yapılmıştır.*
***Bulgular:*** *Taramada 1099 tez bulunmuş, başlık, özet ve içeriğine göre 367'si çalışmaya dahil edilmiştir. Tam metnine ulaşılamayan 35 tez dışında, 332 tez bibliyometrik analize alınmıştır. Tezlerin %96.4'ü yetişkin, %3.6'sı pediatrik popülasyona yöneliktir. Pediatrik çalışmalar son beş yılda artış göstermiştir. Tezlerin %44.6'sı yüksek lisans, %43.1'i tıpta uzmanlık tezidir. En sık "uyum" anahtar kelimesi (%46.4) ve "Morisky Tedavi/İlaca Uyum Ölçekleri" (%17.4 - %17.3) kullanılmıştır.*
***Sonuç:*** *İlaç uyumu ile ilişkili kavramların netleştirilmesi ve özel ölçüm araçlarının geliştirilmesi gerekmektedir. Çalışma, yeni araştırmalar için yol gösterici olabilir.*


***Anahtar Kelimeler:*** *İlaç, Uyum, İlaç Uyumu, İlaca Uyum, Uyunç*

## Introduction

Medication nonadherence, defined as not adhering to medication therapy and pharmacological recommendations, is a significant health issue (1-3). Since long-term medication treatments are often required for all individuals with chronic illnesses, achieving medication compliance is the most desired and expected condition in disease management (1-2). Poor medication adherence among patients is one of the main reasons for treatment failure and leads to a substantial increase in preventable healthcare costs each year (3).

According to the World Health Organization (WHO), by 2030, one in six people in the world will be aged 60 years or older. Projections for 2050 indicate that this number is expected to rise, reaching a population size of 426 million (4). According to data from the Turkish Statistical Institute (TÜİK), the number of individuals aged 65 and over in our country has increased, with their proportion of the total population rising to 9.7% (5). A study conducted on the elderly population in Turkey reported that 85% of the geriatric population had been prescribed at least one medication in 2018, and the proportion of patients receiving prescriptions containing five or

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more medications at least once a month ranged between 16.4% and 20.7% (6). Medication adherence during this period was found to be low, particularly among those taking multiple medications, those lacking knowledge about their medications, those with inadequate health literacy, and those in older age groups (7). Clearly, managing medication adherence in the geriatric population will be one of the most significant health issues in the future (7).

When studies are examined, it is clear that medication adherence is a significant issue not only in the geriatric population but also in the pediatric population. It has been reported that the major problem for children with chronic illnesses is adherence to treatment, with one study showing that 50% of these children are unable to adhere to their medication regimens (8). Another study conducted with children with epilepsy found that the rate of medication noncompliance was 33.3%, with 30-50% of them not adhering to prescribed anti-seizure medications (9).

In light of the studies, it is clear that medication adherence is low among both adult and pediatric populations. However, medication adherence is a crucial parameter that directly affects treatment success, disease management, and overall healthcare costs. Studies have reported that individuals with high medication adherence have higher quality of life and lower psychological complaints (10). Noncompliance with medication therapy leads to an increase in mortality and morbidity rates among patients, and a decrease in quality of life and productivity. Therefore, medication adherence is a significant health indicator that needs to be thoroughly examined in many fields (nursing, medicine, pharmacy, etc.) and can contribute significantly to the literature with its outcomes in both pediatric and adult populations. Various analysis methods can be utilized to examine this concept in detail, which can be addressed by different scientific disciplines and can provide benefits to other fields, individuals, patients, and society as a whole. One of these methods is "bibliometric analysis. "Bibliometric analysis is defined as" a quantitative analysis method that allows the interpretation of a concept that can be examined in various scientific fields with different aspects (year, author, country, related parameters, etc.)" (11). Additionally, bibliometric analyses are robust methods that emphasize various characteristics of publications obtained through systematic reviews (12). The main goal is not to evaluate the outcomes of different types of academic publications such as articles, theses, etc., but to examine the characteristics of the authors, topics, institutional information, and other parameters (13). Based on the data obtained through these methods, it is possible to perform efficiency analyses of specific parameters, trainings, and initiatives and to identify problems (14).

This research will ensure that medication compliance, which is clearly seen to be quite important in both children and adults and has been indicated by studies, is addressed bibliometrically in national theses. Bibliometric analysis groups the results instead of primarily dealing with the results. It was aimed to show the relationship between the results and other parameters. It indicates the status of the studies according to the years, the most studied related parameters, and the measurement tools. This situation will be a step for other studies to be conducted with a forward-looking inference. It reveals the areas that need to be given importance regarding the subject. It will shed light on new studies by showing which areas the studies are focused on and which areas are inadequate in.

**Aim**

It is aimed to systematically evaluate and conduct a bibliometric analysis of graduate theses on medication adherence conducted in our country-Turkey.

**Material and Methods**

The model of the research, the population, the sample, the data collection, and the analysis processes of the obtained data are detailed in this section of the study.

**Research Model**

The "bibliometric analysis method" was chosen as the research model. Within this model, graduate theses on medication adherence conducted in Turkey were analyzed using the bibliometric method. The screening was conducted between June 17-29, 2024, in the National Thesis Center of the Higher Education Council using the terms "medication," "adherence," and "medication adherence." There were no restrictions on the year, language, or field-topic during the screening. Therefore, the aim was to access all theses on medication adherence across various fields and departments.

As a result of the screenings made with these keywords, all theses that are appropriate to the subject in terms of abstract and content, written in Turkish and whose full texts are accessible are the inclusion criterion of the research. All theses that are not appropriate to the subject in terms of abstract and content, written in languages other than Turkish and whose full texts are not accessible are the exclusion criterion.

**Population and Sample of the Research**

As a result of the screenings, 1099 theses were identified, forming the population of this research. Based on the titles, abstracts, and contents, 367 theses were deemed suitable and included in the study. There are 35 theses with restricted full-text access by the authors, making them inaccessible. Therefore, 332 theses were included in the bibliometric analysis, forming the sample of this research.

**Data Sources and Data Collection Tool**

Using the bibliometric analysis method, which was employed to analyze the research data, the graduate theses included in the study were examined in terms of various bibliometric parameters based on the thesis records specified in National Thesis Center of Higher Education Institution. In the research, the populations, years, thesis types, fields, keywords, concepts studied alongside medication adherence, and measurement tools used were collected in a pool. These parameters were identified by examining those discussed in the literature.

**Data Analysis**

For the analysis of the research data, the SPSS 29 program was utilized, and the percentage and frequency values of the data were determined. The research sought to answer the following questions regarding "medication adherence" using the bibliometric indicators listed below:

- What is the distribution of graduate theses according to their populations?
- What is the distribution of graduate theses according to their years?
- What is the distribution of graduate theses according to their types?
- What is the distribution of graduate theses according to their fields?
- What is the distribution of graduate theses according to their keywords?
- What is the distribution of graduate theses according to the concepts studied alongside the topic?
- What is the distribution of graduate theses according to the measurement tools used?

**Results**

The 332 theses comprising the sample of the research were grouped into seven categories according to their populations, years, types, fields, keywords, related concepts, and measurement tools used. These categories were detailed and presented visually using graphs.

***Distribution of Theses on Medication Adherence According to Populations***

When the theses were grouped according to the populations in which they were conducted, it was observed that the majority of the theses were conducted in the adult population (96.4%), while a limited number of theses were conducted in the pediatric population (3.6%). However, it has been determined that studies conducted in the pediatric population have increased rapidly in the last five years (Figure 1-2).

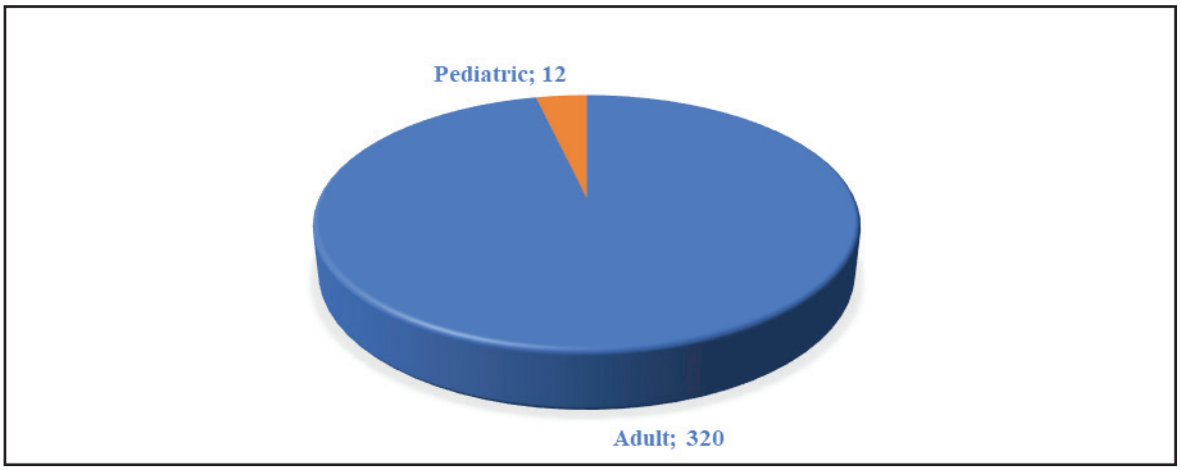


**Figure 1.** Distribution of Theses by Population

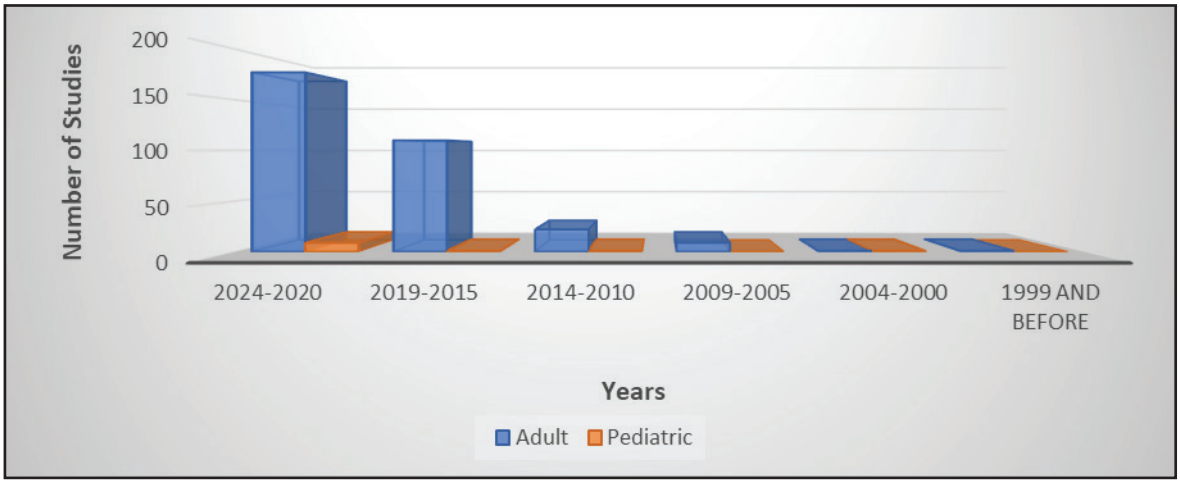


**Figure 2.** Distribution of Theses by Years and Populations

### *Distribution of Theses on Medication Adherence by Years and Types of Theses*

When examining the number of theses by years and types, it has been determined that there is an increasing trend over the years in all types of theses. Among all types of theses, it was found that the first thesis was completed in 1987 and was a master's thesis in the field of nursing. Over the years, the number of master's theses and medical specialization theses has rapidly increased. Similarly, it was found that master's theses (44.6%) and medical specialization theses (43.1%) make up the largest proportions of the total (Figures 3-4).

### *Distribution of Theses on Medication Adherence by Types, Years, and Fields*

When the types and fields of theses on medication adherence are examined in detail, it is found that nursing constitutes the largest proportion in master's and doctoral theses (35%-9.3%), while family medicine constitutes the largest proportion (24.7%) in medical specialization theses (Figures 5-7).

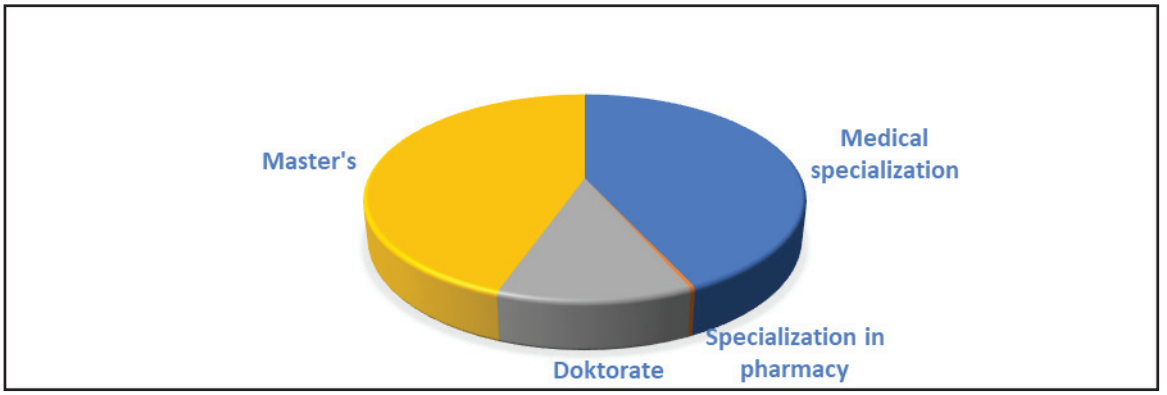


**Figure 3.** Distribution of Theses by Types of Theses

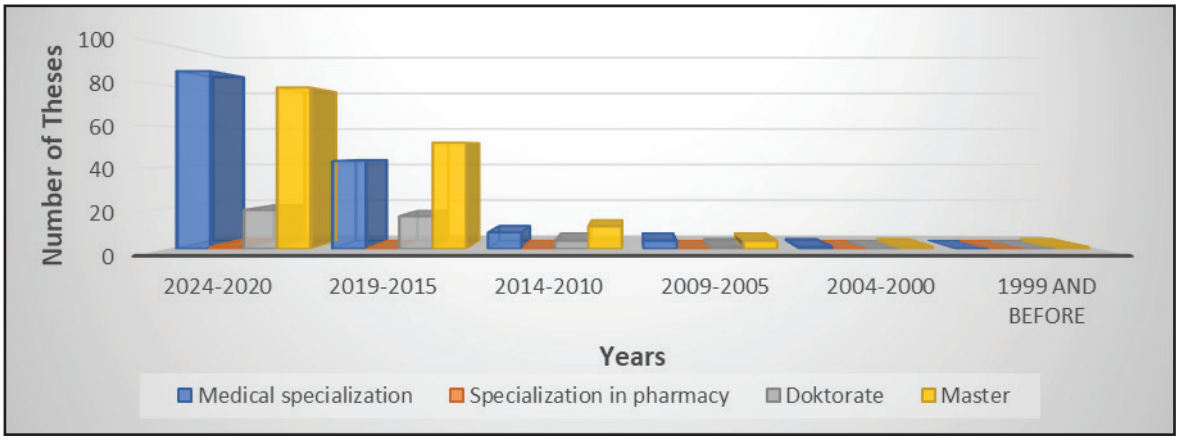


**Figure 4.** Distribution of Theses by Years and Types of Theses

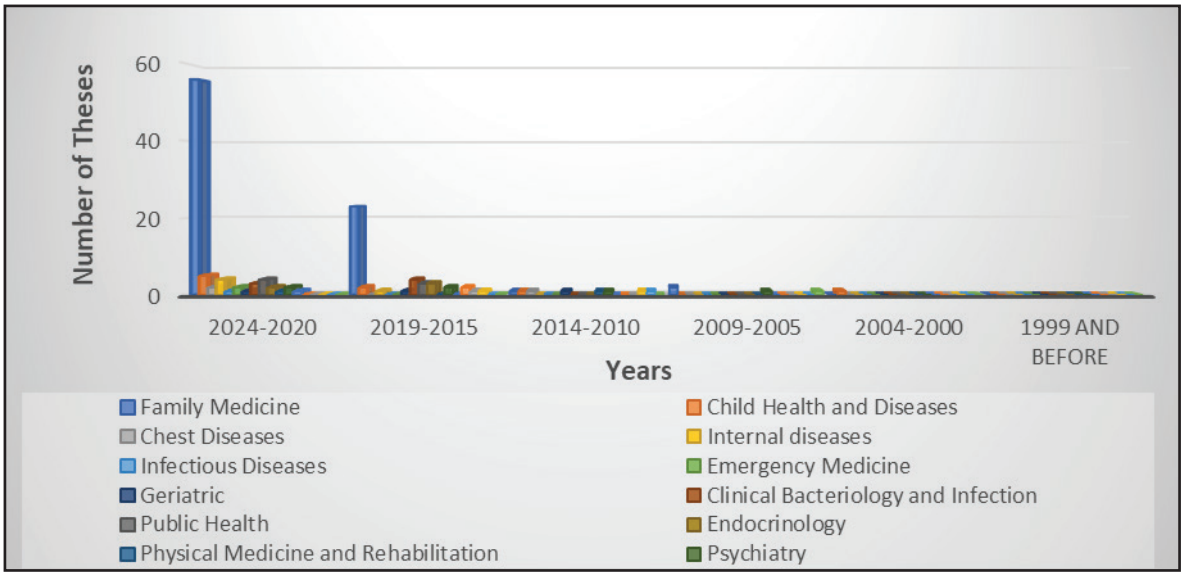


**Figure 5.** Distribution of Medical Specialization Theses by Years and Fields

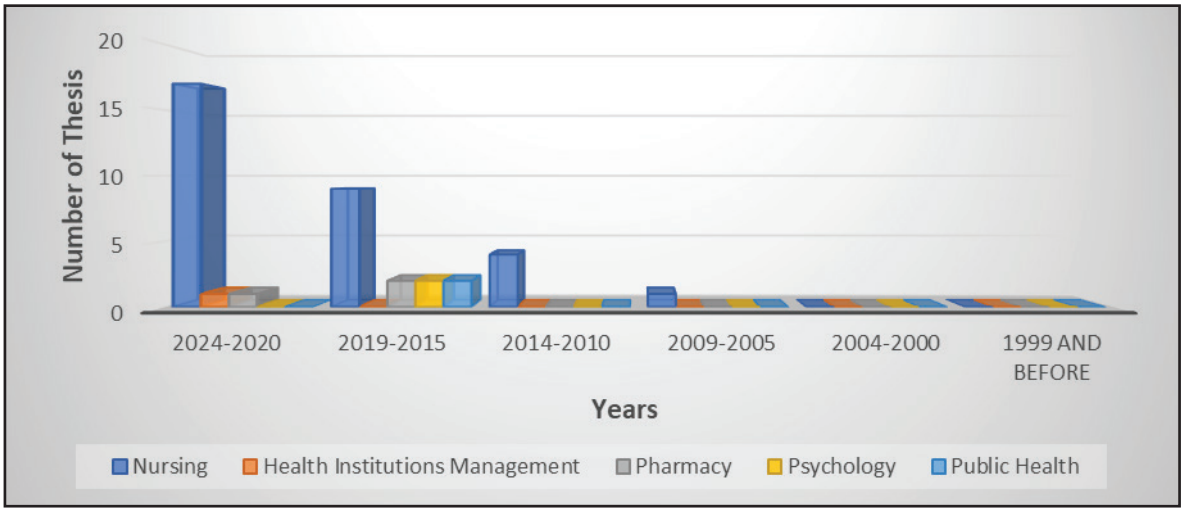


**Figure 6.** Distribution of Doctoral Theses by Years and Fields

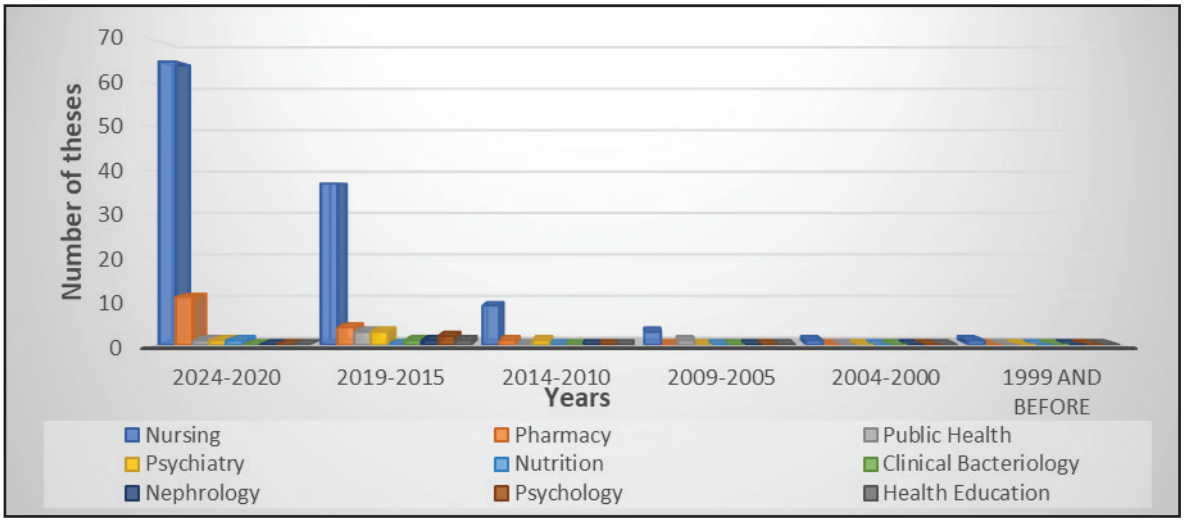


**Figure 7.** Distribution of Master's Theses by Years and Fields

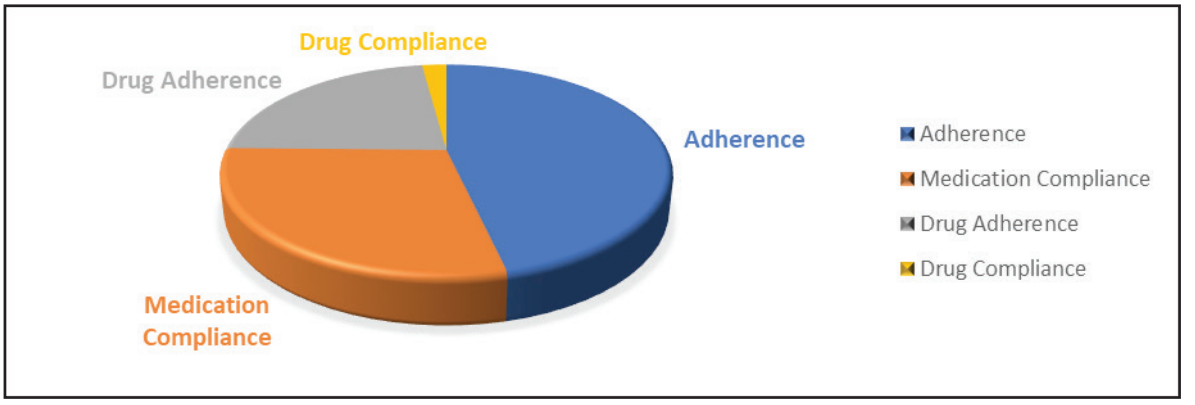


**Figure 8.** Distribution of Theses by Keywords

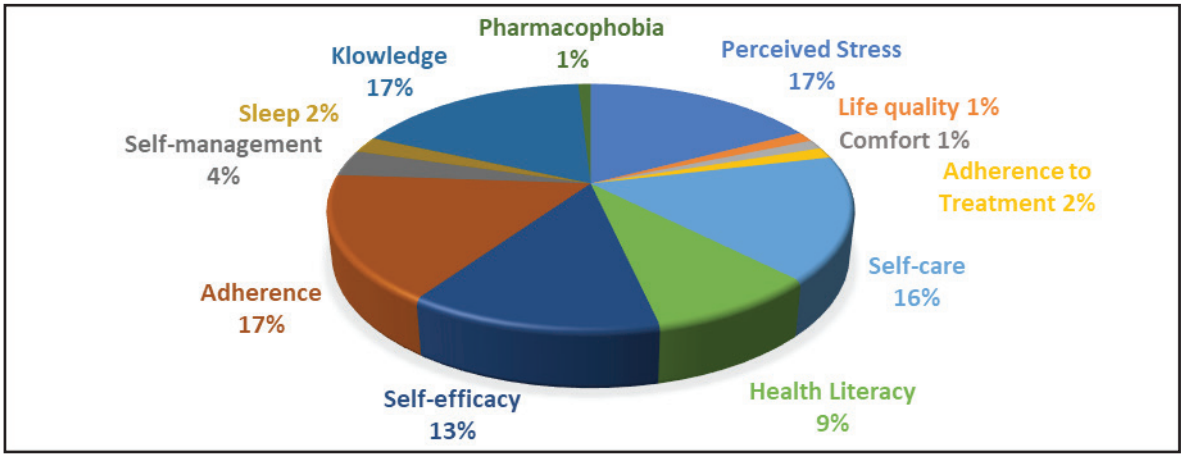


**Figure 9.** Distribution of Theses by Related Concepts

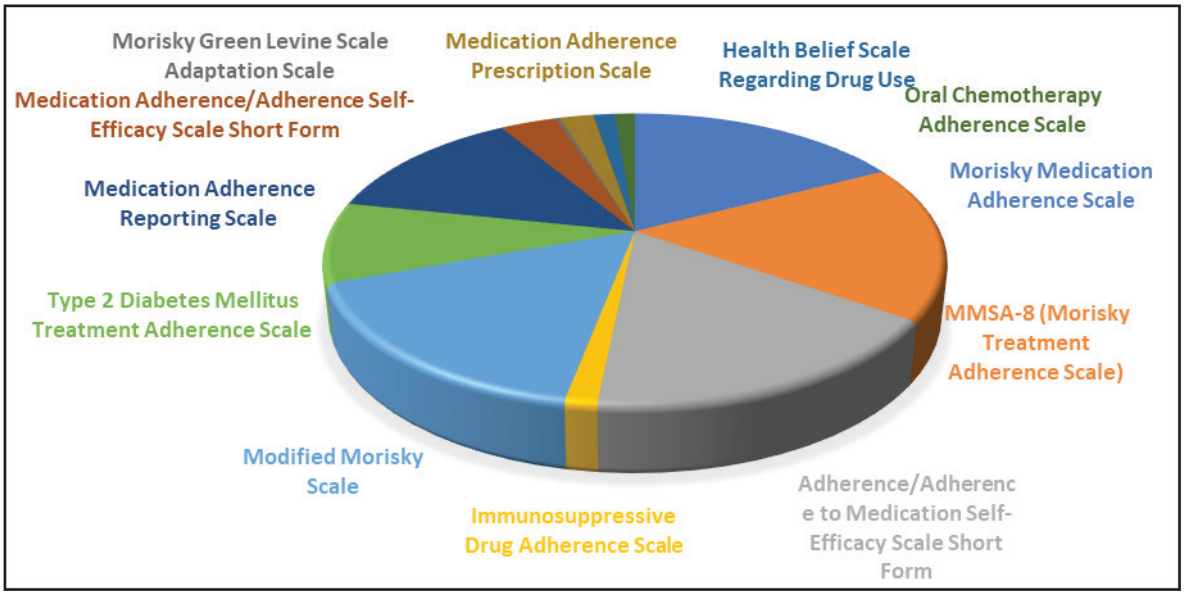


**Figure 10.** Distribution of Theses by Measurement Tools

***Distribution of Theses on Medication Adherence by Keywords***

The most frequently used keyword was found to be "adherence" (46.4%) (Figure 8).

***Distribution of Theses on Medication Adherence by Concepts Studied Alongside Medication Adherence***

When examining related concepts, it was found that the most frequently studied concepts alongside medication adherence are "perceived stress" (17%), "knowledge" (17%), "self-care" (16%), and "self-efficacy" (13%) (Figure 9).

***Distribution of Theses on Medication Adherence by Measurement Tools***

It was determined that the most frequently used data collection tools are the "Morisky Medication Adherence Scale (17.4%)" and the "Morisky Adherence Scale (17.3%)" (Figure 10).

**Discussion**

The study aimed to systematically investigate the populations, years, types, fields, keywords, related

concepts studied alongside medication adherence, and measurement tools used in the theses. Significant findings regarding the development of the topic have been revealed based on the data obtained from this investigation. Although there was no time limitation in the screening, it was found that the first thesis was conducted in 1987, and a total of 332 theses in the National Thesis Center of Higher Education Institution data pool over a 37-year period were evaluated using the bibliometric method.

When the theses are grouped according to the populations in which they were conducted, it is observed that the majority of the theses were conducted in the adult population (%96.4). This situation is thought to be due to the WHO emphasizing the importance and difficulty of medication adherence with increasing age. The WHO highlights that with increasing age, the frequency of prescriptions and the number of prescribed medications increase. Therefore, the necessity for individuals, especially those over 65, to use routine medications even if they do not have an acute illness, and the need for these medications to be prescribed monthly or quarterly, explain the high frequency of studies on medication adherence in the adult population. Additionally, it is known that individuals with chronic illnesses in our country visit family health centers for the use and prescription of their routine medications (4,6,7). Parallel to the literature and in addition to research findings, it is thought by the authors that medication compliance is given more importance in the elderly population due to the increasing life expectancy as a result of technological developments in the world. However, in our age, children do not age but have chronic diseases. In fact, this situation in children is similar to the increased use of medication in the elderly. Children with chronic diseases also have to use medication in the long term. Therefore, compliance with medication use should be given great importance in children as well as in the elderly.

This situation is considered to be the most important reason why "medication adherence" is most frequently studied in medical specialization theses, particularly in the field of family medicine. The professionals who most frequently encounter the elderly and the geriatric population who use medication for their chronic diseases are family are physicians. The reason for the high frequency of studies in the field of nursing in master's and doctoral theses is parallel to this situation. Nurses are the closest professional group to patients in medication treatment, administration, and education (15). Their roles as practitioners, educators, and consultants also strengthen patient-nurse communication (16). This can be seen as the reason why studies examining medication adherence or aiming to improve medication adherence are most frequently conducted in the field of nursing in graduate theses. Family health centers are the most frequently visited healthcare institutions for patients to obtain medication prescriptions (17). The frequent focus on family medicine can also be attributed to this situation.

The increase in the number of studies on medication adherence over the years can be associated with the extension of life spans due to advancing technology and the increasing frequency of chronic diseases and medication use (17). Therefore, medication adherence has become an important health parameter for the future. Besides enhancing the effectiveness of treatment and the patient's quality of life, reducing healthcare costs is also an indication that this topic will be increasingly studied (18). However, it is observed that studies conducted in the pediatric population are insufficient. Yet, it has been reported that medication adherence is also quite low in pediatric patients (8,9). Additionally, the lack of self-efficacy in children, their dependence on an adult to access and use medication, and social stigma are factors that can further hinder medication adherence (19,20). Therefore, there are more risk factors related to medication nonadherence. To combat these issues, it is necessary to increase the number of descriptive studies that can identify the situation as well as educational interventions that can provide motivation and improve medication adherence.

Although the study focused on theses related to medication adherence, some theses related to

treatment adherence were also encountered, and it was observed that these theses contained data on medication adherence. Here, it is evident that there are two concepts with different definitions. In the literature, treatment adherence is defined as the patient's implementation of the recommended treatment regimen, including medications, diet, and lifestyle changes. Medication adherence, on the other hand, is defined as the use of prescribed medications as recommended, on time, and in the appropriate dose (21,22). Here, it is evident that there can be confusion in the use of the two concepts. Therefore, it is recommended to use the keyword "treatment adherence" for all topics related to the management of the disease, and "medication adherence" for the regular continuation of only the prescribed pharmacological treatment. This choice will be crucial for the correct use of terminologies.

The related concepts mentioned in the study are those examined alongside "medication adherence." Concepts such as perceived stress, knowledge, and health literacy have frequently been evaluated together with medication adherence in theses. In general, these studies have assessed the relationship with one or, at most, two of these concepts. The relationship/predictability of medication adherence with more than two concepts has not been evaluated. Additionally, most of the theses have designed descriptive studies, and studies with educational/intervention groups are less frequent. It is thought that this finding will shed light on and guide new studies to be included in the literature.

When examining the use of measurement tools, it has been found that the same measurement tools are consistently used. It is possible to see the same measurement tool being used for children, adults, and almost all diseases. The continuous use of the same measurement tools always measures the same findings. Using the same measurement tools to evaluate medication adherence for different chronic diseases cannot reveal the differences arising from the disease or the medication used. Measuring medications with different effects and side effects on different systems using the same measurement tool results in a lack of specific and in-depth findings related to the disease or medication. Therefore, patient adherence to medications with severe effects, such as chemotherapy, and adherence to routinely used antihypertensive medications that need to be taken for many years must be evaluated using the same measurement tool. This situation can hinder the assessment of medication-specific adherence. The very limited number of measurement tools specific to the pediatric population, and the use of adult scales for children, ignore the chance to capture pediatric differences.

Measurement tools that measure system diseases specific to children should be developed. For example, a measurement that measures compliance with chemotherapy and radiotherapy in children Tools, scales measuring compliance with antiepileptic drugs, disease and system specific pediatric scales should be developed. However, these scales will be able to test the status of drug compliance specific to the growth and development period of children, the reasons for it and the factors that increase compliance. This presents a good starting point for new studies to be conducted.

The sample of this study consists of master's and doctoral theses in the field of Turkish education. The sample was formed as a result of the search made from the keywords searched in the National Thesis Center of the Council of Higher Education (YÖK). This situation can be considered as a limitation of the study. However, the strengths of the study are that there is no year limitation in the study, the screening was done in both adult and pediatric populations, the bibliometric analysis is not a method that gives direct findings but a method that categorizes the findings, and it is a method that expresses and examines commonly used parameters (such as medication compliance, diet compliance) by grouping them.

**Conclusion And Recommendations**

As a result of this study:

- The importance given to the pediatric population in medication adherence studies is insufficient,

- The studies conducted in the pediatric population have increased rapidly in the last five years,
- When examined in terms of thesis types and fields, it was determined that nursing constituted the largest proportion of master's and doctoral theses, while family medicine constituted the largest proportion of medical specialty theses,
- The most frequently used data collection tools are "Morisky Treatment Compliance Scale" and "Morisky Medication Compliance Scale",
- It is recommended to develop new measurement tools tailored to the population and the disease system affected by the medication (e.g., diabetes, hypertension, immunosuppressive, chemotherapy, etc.),
- It is recommended to avoid confusion between the concepts of medication adherence and treatment adherence.

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