

# Bibliometric Analysis of Studies on Empathy and Empathic Thinking Skills

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**Abstract.** Empathy, a crucial social skill that can lead to positive results, has gained more attention in recent years. This study aims to systematically examine research on empathy and empathy skills. For this purpose, within the scope of the research, studies on empathy and empathic thinking skills were subjected to bibliometric analysis. Analyzing bibliographic information is one of the most important methods for tracking aspects of scholarly communication, assessing research trends, and determining the priorities of research fields. Since this study focuses on the trends of studies on empathy and empathic thinking skills, the method of the research was determined as bibliometric analysis. The study group of the research consists of between the years 2013-2023 1135 articles accessed from the Web of Science database. According to the first finding of the research, it was seen that studies on empathy were mostly published in 2014. Additionally, most of the studies were published in the journal "Social Cognitive". The third observation is that most research is conducted in the health field. Following it were psychology and education. A fourth conclusion was that the correlation design, one of the quantitative research methods, was preferred. Additionally, It was determined that the sample levels of the studies were primarily adults and university students, and the sample size was between 31-100. It was observed that descriptive analysis, correlation, and ANOVA were mainly used in data analysis of the studies. In light of the findings obtained from the research, it is suggested that empathy-based studies can be carried out with preschool, primary school, and young children, and the number of meta-analysis and meta-synthesis studies can be increased.

**Keywords:** Bibliometric Analysis, Empathy, Empathic, Empathic Thinking Skills, Thinking Skills

## 1. Introduction

Interpersonal communication has been accelerated by today's technological developments. Still, they have not been able to advance the depth of communication face to face or verbal, and the emotional sharing dimension at the same level. In this age where face-to-face, oral, and expressive communication is decreasing, it is equally difficult for individuals to understand each other's feelings. Empathy and empathic thinking and skills, as an innate instinctive value of humans, come to the fore to strengthen interpersonal communication in the fast-changing and developing world. Digitalization has greatly improved accessibility to information and necessities. However, this easy access has supported individuals to focus mostly on their own needs and requirements, in a way, desensitizing them to the needs and requirements of others and hindering empathic thinking. The opposite is also possible; With digitalization, individuals can observe, feel, and empathize with the sad events experienced by other people in negative humanitarian events and situations experienced in different countries and cultures. In this age, for a peaceful, understanding world where problems can be easily solved, empathy and empathic thinking must exist in every area where a living creature exists (Nishida, 2013).

### 1.1. Problem Statement

Empathy is an important skill and concept that helps people develop better understanding, cooperation, and human values. Therefore, interest and research on empathy have increased and this trend is likely to continue in the future. From this point of view, the reason for this research is to examine the studies on empathy, which is an important research topic in more than one field and will guide the studies to be done in the future. It is thought that a systematic

bibliometric analysis of the studies on the concept of empathy, which is called an important emotion and skill in psychology, health, education, and social sciences, is important and necessary for the literature.

Empathy studies are needed for a variety of reasons. A few examples of these are improving human relations, social sensitivity, problem-solving, reducing anxiety and stress, improving leadership skills, and helping the teacher understand the student better during education and training (Altavilla, Manna & Lipoma, 2021; Holt & Marques, 2012; Nair et.al, 2023; Pittelkow et.al, 2021).

As a basis for one of the researchers' doctoral thesis, this study aims to determine the trends in empathy studies. Empathy studies that need to be focused on in the literature can be determined as a result of this research, and future studies may be inspired by these findings. Based on these considerations, the main purpose of the research is to conduct a bibliometric analysis of studies with empathy and empathic content between the years 2013-2023.

## **1.2. Related Research**

It has been observed that there are a limited number of bibliometric analysis studies (Krishnan et.al, 2020; Huang et.al, 2018; Zhi-Jiang & Pan-Cha, 2017) on empathy in the literature. In their study where Huang et al. (2018) analyzed the current status and deficiencies of research on nurses' empathy skills in China using the bibliometric method, they concluded that 69% of the studies were conducted with quantitative methods and that qualitative studies should be supported. Zhi-Jiang & Pan-Cha (2017) examined the trends of empathy studies between 1996 and 2015. The results of the study, in which 1199 publications were analyzed, are as follows; According to 9073 studies in English and 1178 in Chinese, it has been revealed that there has been an increase in the number of studies on empathy in the last 20 years. Data showed that this increase was significant after 2008. Elliot et al. (2023) examined mixed methods studies investigating the effectiveness of empathic thoughts with a qualitative meta-analysis. According to the results of the study consisting of 43 samples, it was concluded that the effectiveness of empathic thoughts was not at a sufficient level. The current study differs in its research method and focuses on the analysis of empathic studies by including all studies involving mixed, quantitative, and qualitative methods. In this respect, the current study aims to reach results that are different from others and with a large sample.

It seems that the common aspect of these studies is in the field of health and the studies carried out until 2015. The difference between the current study from other studies is that it provides more comprehensive and up-to-date data on a yearly basis.

## **1.3. Research Objectives**

Based on this general purpose, the research questions are as follows:

- 1) What is the distribution of the study years?
- 2) What is the distribution of the studies according to the journals in which they are published?
- 3) What is the distribution of studies according to disciplines?
- 4) What is the distribution of studies according to research methods and designs?
- 5) What are the sampling level and size distributions of the studies?
- 6) What is the distribution of the studies according to data collection tools?
- 7) What is the distribution of the studies according to the analysis of the data?

## **2. Theoretical Framework**

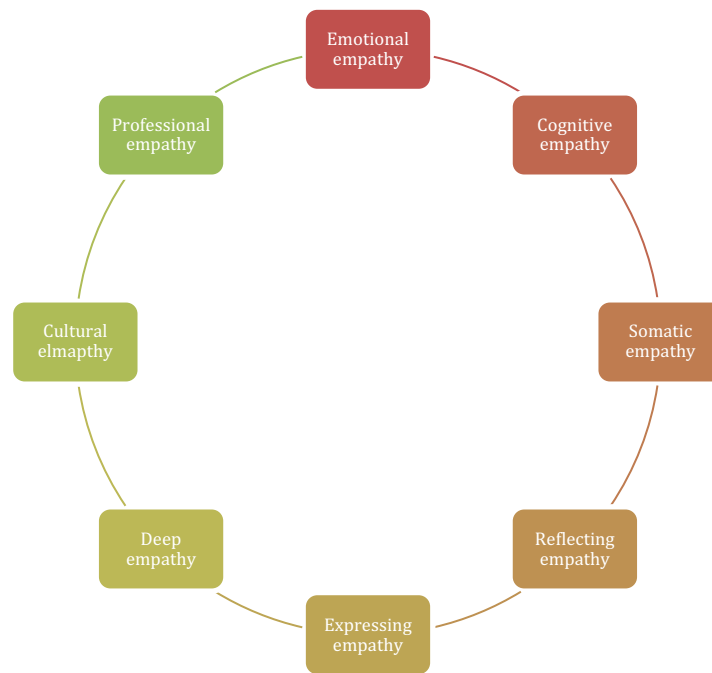
Empathy is broadly defined as a person's ability to understand and share the emotional or mental states of others. There are different definitions of empathy among researchers. Psychotherapist Carl Rogers (1975) defined empathy as "the ability to enter another person's

world with mutual understanding and sensitivity" (cited by Elliot et al., 2023). According to him, empathy forms the basis of a positive relationship in therapy processes. Daniel Goleman (2017) defined empathy as "the ability to understand and share the emotional state of others". He is one of the names that popularized the concept of emotional intelligence (EQ). (Goleman, McKee & Waytz, 2017). Tania Singer (2009) defines empathy as "the ability to understand the emotional experiences of others and identify with your own." Singer conducted studies on the brain activity of empathy and examined the neurological basis of empathy (Singer & Lamm, 2009).

Psychologist Simon Baron-Cohen (2010) defines empathy as "the ability to understand and relate to the emotional states of others." His "Empathy Deficit Theory" explores the relationship between a lack of empathy and conditions like autism. Although these researchers have considered different aspects of empathy, it is generally considered the ability to understand the emotional experiences of others, share them, and help others. Empathy plays an important role in human relations and social harmony, and emotional intelligence has been the subject of research in many fields such as psychology, neuroscience, and social sciences.

Empathy has a historical development process as a concept related to understanding human relations and human behavior. The word "einführung", meaning "empathy", was first used by Rudolph Lotz and Wilhelm Wundt in the 1880s. Although the author Vernon Lee (Violet Paget) was the first to use the word *einführung* in English (translating the word as sympathy, which includes emotions), it was Titchener who translated it as it is known today as "empathy". Titchener (1924), using the Greek word "empathia" (this word consists of the Greek roots "in" and "pain-passion"), translated the word *Einführung* from German to English as "Empathy". The real development of empathy, which emerged from fine arts and gradually found its place in psychology, occurred in the 20th century with the development of personality psychology. Psychotherapists such as Carl Rogers have recognized empathy as a fundamental component of their therapeutic process. During this period, many studies have been conducted on how empathy develops, how it is measured, and its relationship with brain activity (cited by, Gökçe-Ersoy & Köşger, 2016).

In the 21st century, the importance of empathy has increased with developing technology. Empathy has found more emphasis in the 21st century in social relations, education, healthcare, business, and more. Empathy is considered an important concept that improves people's ability to understand and support each other and establish better social relationships. Empathy is an important human skill that helps people develop better understanding, cooperation, and social harmony. Although it has been dealt with in different cultures and disciplines historically, empathy is accepted as a fundamental component of human relations today. Empathy can come in different types and express people's ability to understand and share the emotional or mental states of others in different ways. Here are some important categories of empathy types (Björkqvist, Österman, & Kaukiainen, 2000; Bischof-Köhler, 1991):



**Figure 1.** Types of Empathy

**Emotional Empathy:** Emotional empathy is the ability to understand the emotional states of others and to experience these emotions within oneself. A person understands another person's joy, sadness, fear or happiness and experiences these emotions within himself.

**Cognitive Empathy:** Cognitive empathy is the ability to understand the thoughts, perspectives, and perspectives of others. This type of empathy focuses on understanding what others are thinking and why they are exhibiting certain behaviors.

**Somatic Empathy:** Somatic empathy is the ability to understand the physical experiences of others. For example, the ability to understand and empathize with a person's pain or physical ailment may be termed somatic empathy.

**Reflecting Empathy:** Reflecting empathy is a communication technique you can use to show that you understand and support the emotional experiences of others. By accurately reflecting on the feelings of others, you can express your better understanding of them.

**Expressing Empathy:** Expressing empathy is the ability to express, verbally or non-verbally, that you emotionally support and understand others. Expressions such as telling others that you are listening, concerned, or happy reflect this type of empathy.

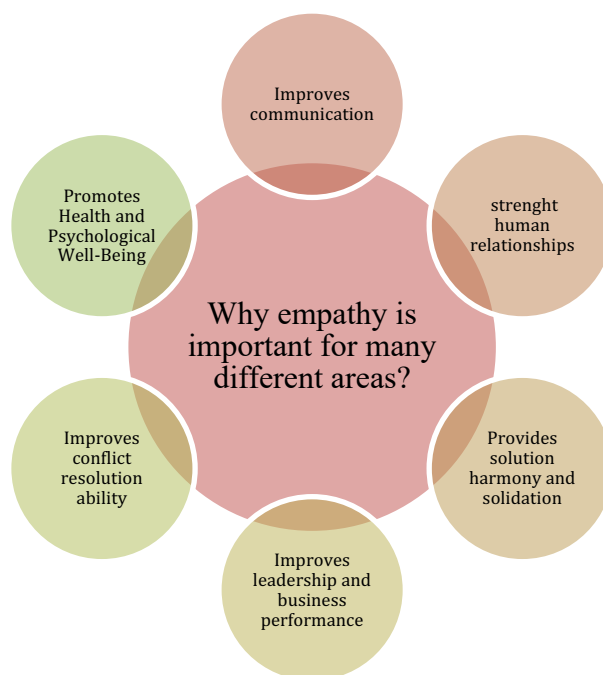
**Deep Empathy:** Deep empathy refers to understanding the emotional experiences of others with greater depth. This type of empathy involves people seeking to explore the emotional worlds of others with greater sensitivity and detail.

**Cultural Empathy:** Cultural empathy refers to the ability to understand the perspectives and life experiences of people from different cultures. This type of empathy can help increase cultural understanding and promote tolerance.

**Professional Empathy:** Some professions may require a certain type of empathy. For example, healthcare professionals can provide better patient care by establishing emotional empathy with patients.

These types of empathy can help people communicate better with others, develop empathy, and become better people. All types of empathy can be important in different contexts and relationships and can contribute to people developing greater understanding and values of humanity.

There are many reasons why empathy is important, and these reasons can be applied effectively in different areas. We can summarize these as follows (Davis, 2006):



**Figure 2.** Why is Empathy Important in Many Different Fields?

**Strengthens Human Relationships:** Empathy strengthens relationships between people. The ability to understand the emotional and mental experiences of others allows you to make deeper and more meaningful connections. This is important in many different contexts, from family to business relationships.

**Improves Communication:** Empathy provides more effective communication. The ability to understand the emotions of others helps you communicate more openly and sincerely. This can reduce conflicts in personal and business relationships.

**Provides Social Harmony and Solidarity:** Empathy increases social harmony and solidarity. The ability to understand others' perspectives enables better cooperation and cooperation within society.

**Improves Leadership and Business Performance:** Empathy in business is important for leaders. Leaders demonstrate better leadership when they understand the needs and emotional states of their employees. It can also improve job performance in terms of empathy, teamwork and collaboration.

**Promotes Health and Psychological Well-Being:** Empathy in healthcare increases trust between patients and healthcare professionals and promotes better patient care. Additionally, in fields such as psychotherapy, empathy can form the basis of a positive relationship between the client or patient and the therapist.

**Improves Conflict Resolution Ability:** Empathy improves conflict resolution skills. By understanding the other party's point of view, a person can resolve conflicts more constructively.

Empathy offers the ability to better understand and support human relationships, communities and individuals. That's why empathy is an important skill at a personal, social and societal level and plays a huge role in creating a more understanding, respectful and collaborative world. In recent years, it has been observed that studies on empathy and empathy have increased. There are several main reasons for the increase in studies on empathy (Sanders et al., 2021; Pham, 2023):



**Figure 3.** The Reasons for the Increase in Studies on Empathy

**Social Changes and Awareness:** In recent years, social changes and awareness have led people to show more interest in empathy. People have become more sensitive to the problems of misunderstanding, discrimination, and inequality between different groups.

**Mental Health Awareness:** The importance given to mental health issues and emotional well-being has increased. Empathy is an important tool for increasing people's awareness of emotional intelligence and psychological health.

**Education and Business World:** Educational institutions and the business world have begun to recognize empathy as an important skill. Educational institutions are increasingly embracing empathy training to help students develop social and emotional skills. The business world also encourages empathy for professionals who want to improve their leadership and collaboration skills.

**Neuroscience and Psychology Research:** Advances in neuroscience and psychology have further contributed to the understanding of empathy and human behavior. Brain scanning technologies have made it possible to study the neurological basis of empathy.

**Internet and Social Media:** The Internet and social media platforms have enabled people from different cultures around the world to come together. These platforms help spread empathy-inducing stories and information faster.

**Crises and Disasters:** Times of crisis may cause people to need empathy more. Natural disasters, pandemics, wars, and other events can increase people's tendency to show solidarity and empathy.

**Psychotherapy and Counseling:** Psychotherapists and counselors accept empathy as an important component of their treatment processes. Empathy can help people understand and overcome their emotional difficulties (Betzler, 2020; Pham, 2023).

### 3. Method

#### 3.1. Research Design

Since the aim of this study was to determine the trends and effects of studies on empathy, bibliometric analysis was found to be the most appropriate method for the purpose of the research. Bibliometric studies are research based on document analysis that allows publications to be analyzed with different methods and evaluation of scientific studies (Alsharif et al., 2020). Using the bibliometric analysis method, studies published in the academic field are evaluated within the scope of different bibliometric features (subject, year, contributing institution, keywords used, sources used, number of authors of the works, citations, self-citations, etc.) and some findings regarding scientific evaluation are obtained. Bibliometric analysis can determine how influential research is and how often it is cited. This is useful for measuring the importance and impact of research in the scientific community. Bibliometric analysis can help identify the development and trends of research on a particular topic over time. This is important for identifying future research areas and improving research methods. Bibliometric analysis can be used to identify scientific collaboration networks between different researchers, institutions, and countries. This is useful for identifying potential collaboration opportunities and improving research productivity. Bibliometric analysis can help an institution or research group manage its resources effectively and plan for future research projects. This is important for budget allocation and optimizing resources. Bibliometric analyses often use large datasets, and if this data is missing or inaccurate, the results can be misleading. In particular, data sets that are manually collected or have missing records in databases can affect the accuracy of the analysis. Some studies, although influential, may not receive enough citations. This may not fully reflect the true impact of the research in bibliometric analyses. Bibliometric analyses often focus on publications in English and may ignore research in other languages. Additionally, it may not fully reflect the influence of a particular country or culture on the scientific community.: In some cases, data sets used in bibliometric analyses can be very large, which can increase the complexity of the analysis. This can complicate the meaning and interpretation of the analysis (Donthu et.al, 2021).

#### 3.2. Participant

The study group of the research consists of a total of 1135 articles published in journals in the "Web of Science (WoS)" database between 2013 and 2023. There are bibliometric analyses conducted until 2015 in the literature. The reason for analyzing studies between 2013 and 2023 in the current study is to focus on current studies and to compare them with past studies before 2015. In this way, it was thought that the research would reflect more realistic and scientific results. While forming the study group of the research, a criterion sampling system was used. The determined criteria are as follows:

- 1) Studies published between 2013-2023
- 2) "Empathy" or "empathic skills" were mentioned in the titles and keywords of the studies.

#### 3.3. Data Collection

The data in the research were obtained by document analysis method. By analyzing documents, researchers can access data that was previously unavailable and would otherwise take enormous effort and time to collect (Morgan, 2022). The relevant documents of the research were accessed from the "Web of Science (Wos)" database. Before the research, a total of 1138 studies meeting the above criteria were reached. However, 3 studies in which open access could not be provided were not included in the study.

#### 3.4. Data Analysis

In this study, all data were subjected to descriptive content analysis. The descriptive content analysis method means the in-depth examination and organization of qualitative and

quantitative studies conducted independently of each other on a specific subject or field. Thus, general trends in that subject or field are determined. The results obtained in this method are expected to guide future studies planned on the targeted topics. The research data were analyzed through descriptive analysis using the information in the "study review form" (Bekirođlu & Őtkűr- Gűllűhan, 2022). First of all, all the articles were collected in one file, and then their information was transferred to the Excel file via the article study form. Then, the frequency calculation of each information in the article study form was made. Finally, the frequencies are presented in the form of figures and graphs.

### 3.5. Validity and Reliability

Regarding the reliability of the studies, support was received from a faculty member of the Curriculum and Instruction department at a state university. For each sub-goal, the "coder reliability" formula developed by Miles and Huberman (1996) was used. The reliability rates and average calculated for each sub-objective are shown in Table 1.

**Table 1.** Reliability Coefficients

Purposes	Realibility Rate
1st sub-objective	0.97
2nd sub-objective	0.88
3rd sub-objective	0.78
4 th sub-objective	0.77
5 th sub-objective	0.78
6 th sub-objective	0.88
7 th sub-objective	0.88
8 th sub-objective	0.92
9 th sub-objective	0.92
Mean	0.86

As shown in Table 1, the reliability rate achieved as a result of the encoder reliability is 0.86. According to Miles and Huberman (1996), 0.70 and above is reliable. As a result, a reliability coefficient of 0.86 can be assigned to the results obtained from this study.

## 4. Findings

Describe the findings comprehensively and build them into sub-findings or themes according to the research method and design.

### 4.1. Distribution of Studies by Years

Figure 4 shows the findings regarding the distribution of relevant studies by years.



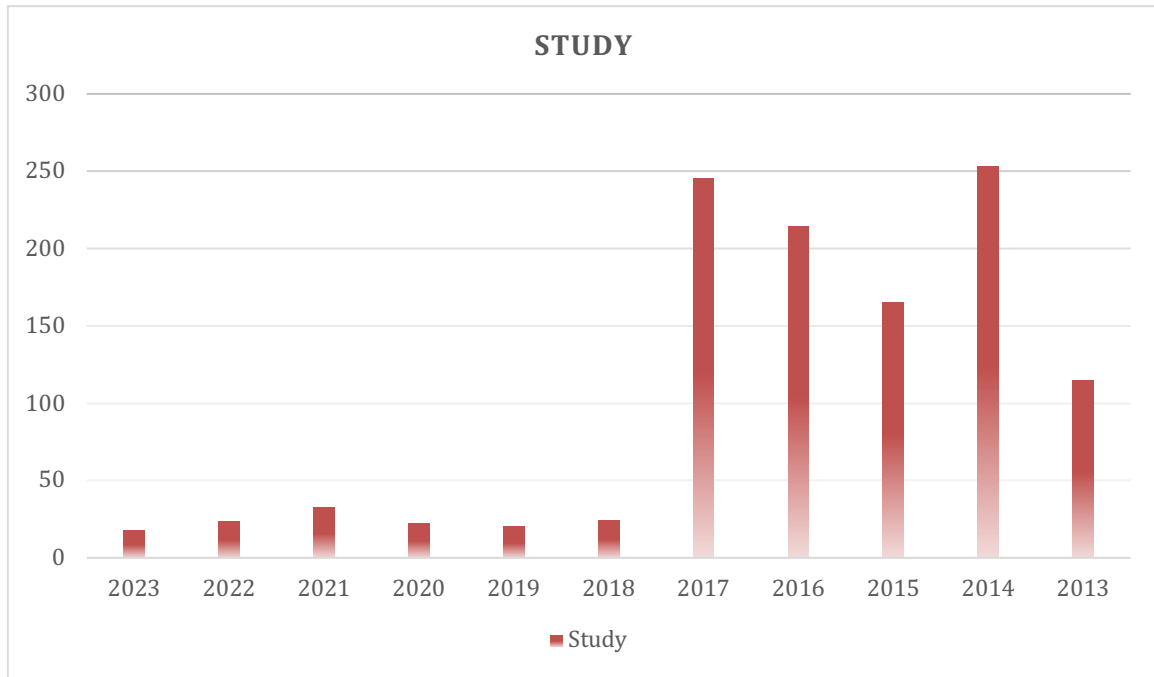


Figure 4. Distribution of the Studies by Years

As seen in Figure 4, empathy-related studies were mostly conducted in 2014 (f=253). As the number of studies decreases by year, they are as follows: In 2017 (f=245), 2016 (f=214), 2015 (f=165), 2013 (f=115), 2022 (f=24), 2020 (f=23), 2018 (f=25), and in 2019 (f=20). According to this finding of the research, most empathy studies were published in 2014.

#### 4.2. Distribution of the Studies by Journals

Figure 5 shows the findings regarding the distribution of relevant studies by journals.

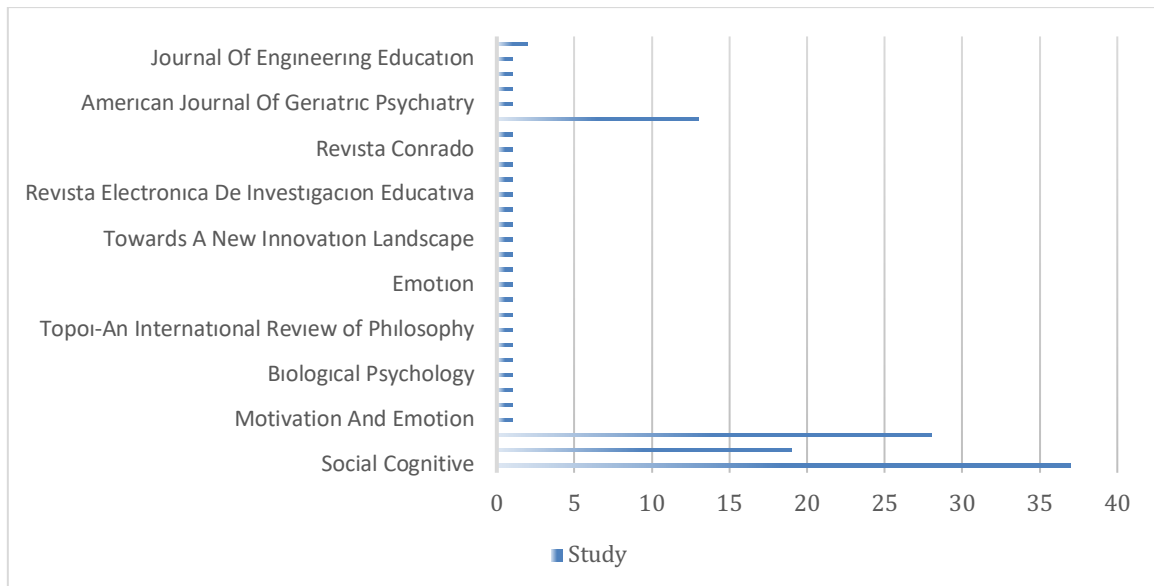
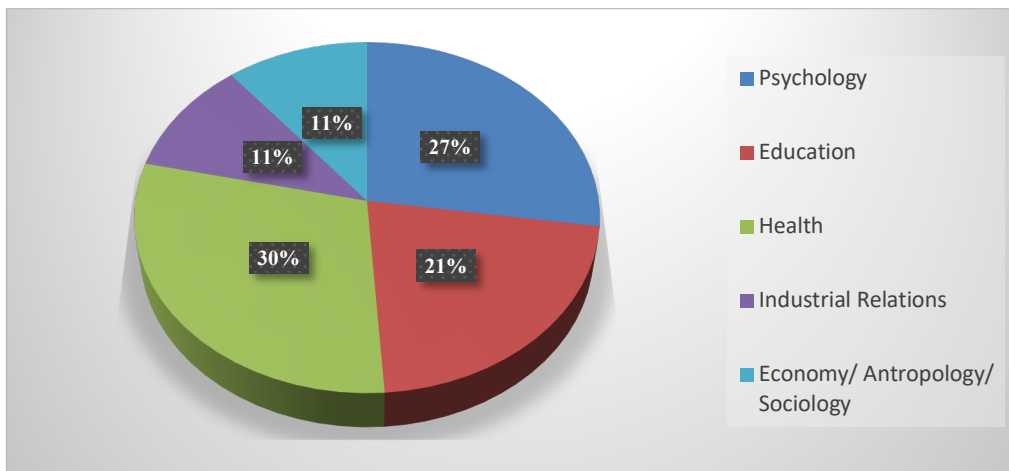


Figure 5. Distribution of the Studies by Journals

Figure 5 shows Empathy studies are published most frequently in the journal "Social Cognitive (f=37), Psychological Management (f= 28), BMC Medical Education (f=19), Frontiers in Psychology (f = 13). After this journal, Teaching and Teacher Education is the most published journal. According to this finding of the research, empathy studies were mostly published in the journal Social Cognitive.

### 4.3. Distribution of the Studies by Discipline

Figure 6 shows the findings regarding the distribution of relevant studies by disciplines.

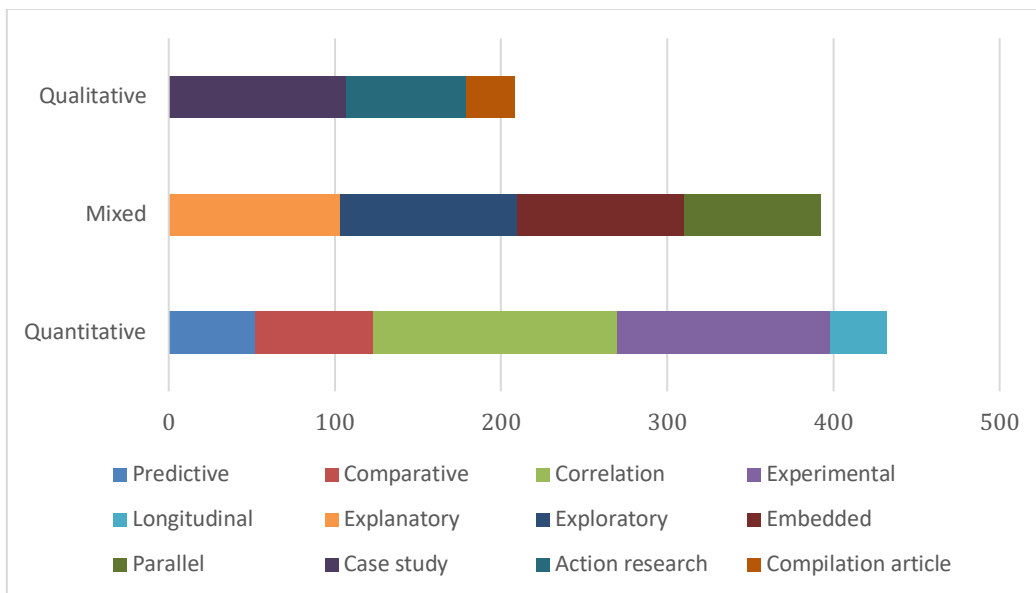


**Figure 6.** Distribution of the Studies by Discipline

As can be seen in Figure 6, the studies were mostly conducted in the field of health (f = 336), The following are the fields that were studied in decreasing order: Psychology (f=310), education (f = 245), sociology/economy/anthropology (f = 123, industrial relations (f = 121). According to this finding of the research, empathy studies were mostly conducted in the field of health.

### 4.4. Distribution of the Studies by Designs

Figure 7 shows the findings regarding the distribution of relevant studies by methods and designs.

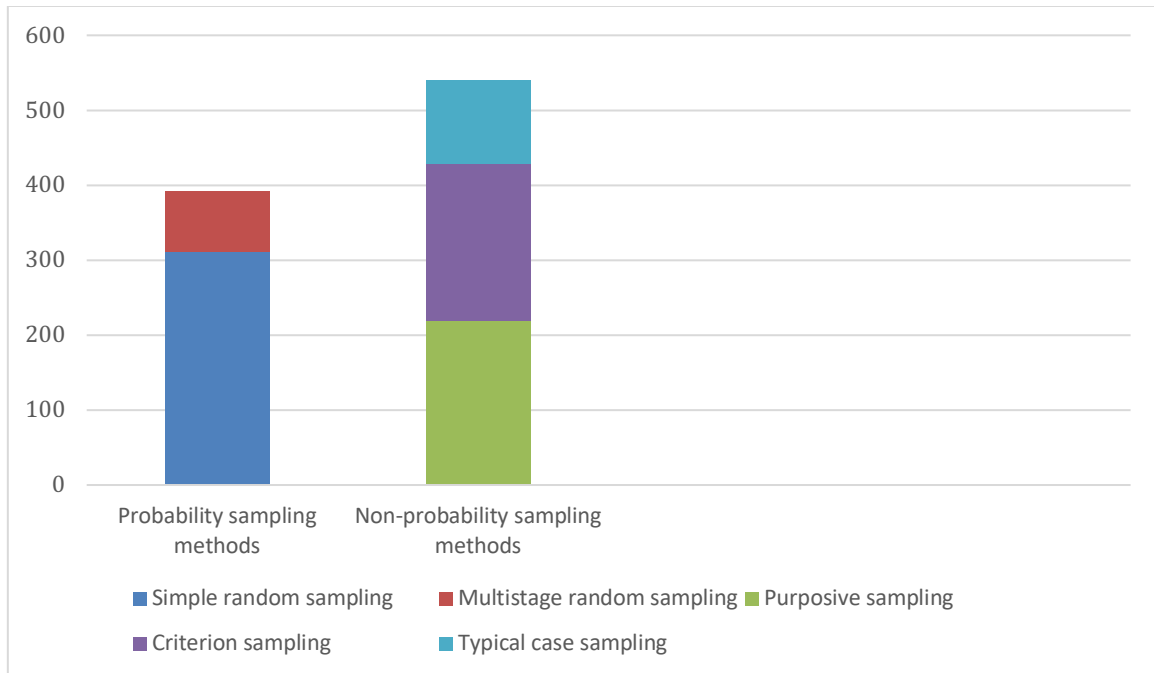


**Figure 7.** Distribution of Methods and Designs

As seen in Table 4, most of the studies are in the type of quantitative research (f=432). In quantitative studies, correlation (f=147) research design was used the most. In the second, it was seen that the studies were conducted with mixed method (f=392). In mixed methods, exploratory design (f = 107) was used most. Qualitative studies (f=209) came in third. Case study (f=106) design was most commonly used in qualitative studies. According to this finding of the research, empathy studies were mostly conducted with quantitative methods.

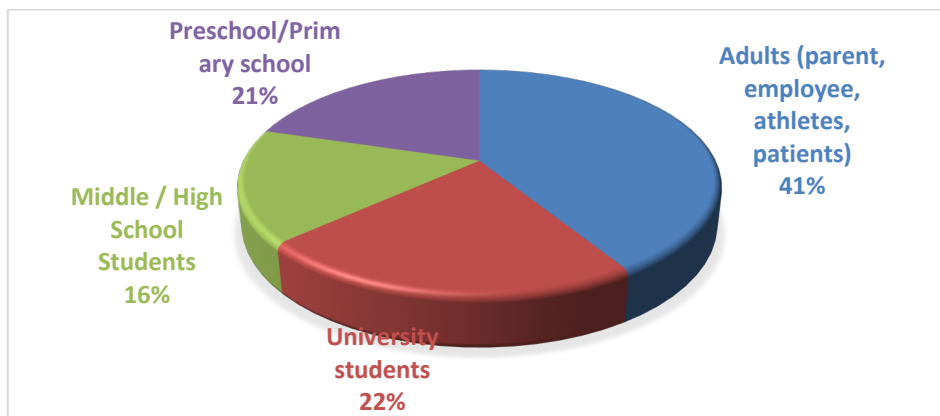
#### 4.5. Distributions of Sampling Level and Size

As a result of the analysis of the data obtained, the distribution of the studies according to sample level and size is shown in Figure 8 and 9.



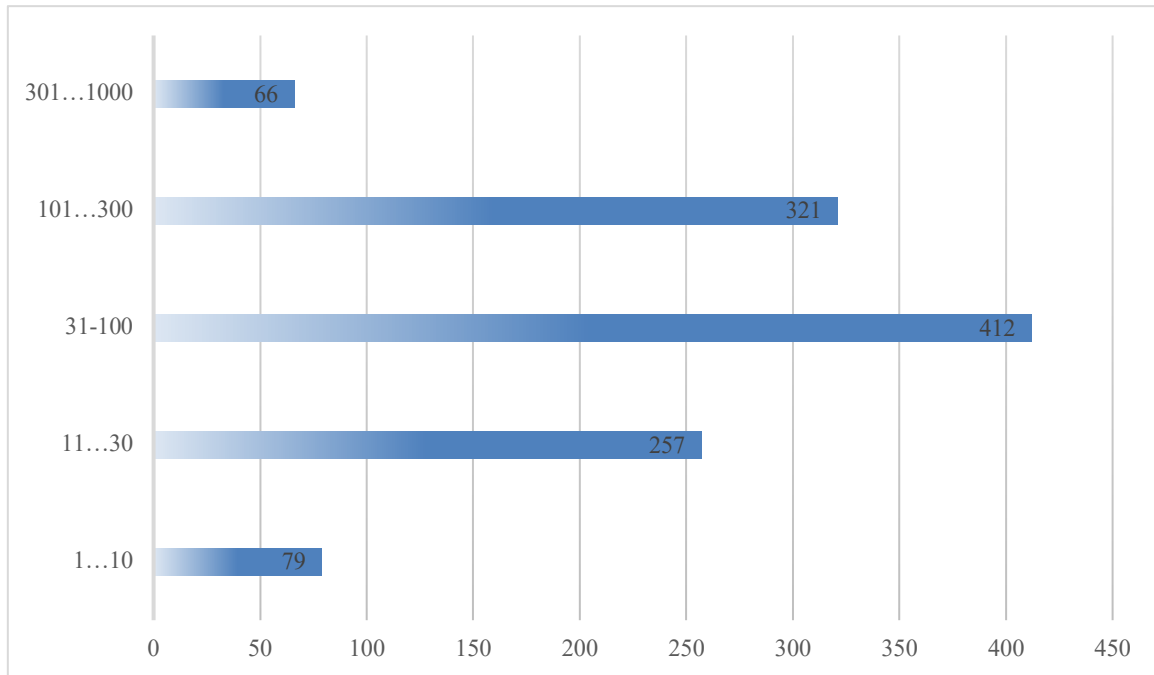
**Figure 8.** Distributions of the Sampling Method

According to Figure 8, the most probable sampling method (f =392) was used in the studies. Among the probability sampling methods, simple random sampling (f=312) was most preferred. In addition to non-probability sampling, purposeful sampling was used (f=219), criterion sampling was used (f=210), and simple case sampling was used (f=111).



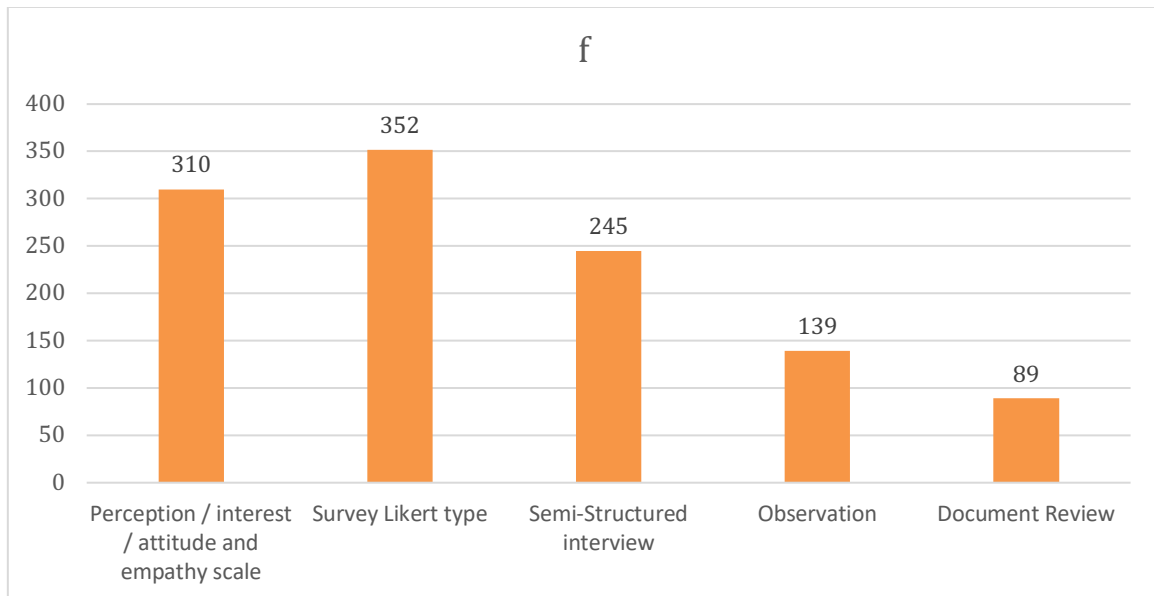
**Figure 9.** Distribution by Sample Level

Figure 9 shows adults (f=467) came first in the sampling levels. In descending order, university students (f=252), preschool and primary school (f=231) sample, secondary school and high school students (f=185), sample levels were used in the studies.



**Figure 10.** Distribution by Sample Size

Figure 10 shows the sample size in the studies is mostly between 31-100 (f=412). There are studies in the range of 101-300 (f = 321) and there are 257 studies in the range of 11-30 and 66 studies for 301-1000. There are 79 studies in the range of 1-10, and there are no studies in the range of more than 1000.



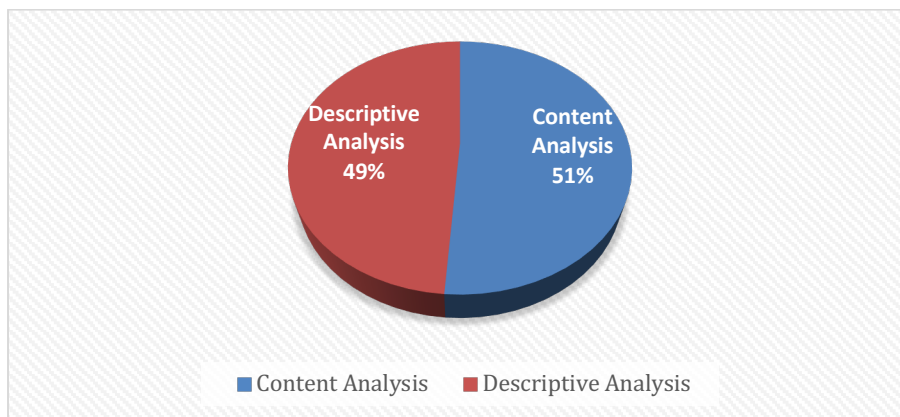
**Figure 11.** Distribution by Data Collection Tools

Figure 11 shows the survey (f = 352) is the most used data collection tool. In descending order, the empathy scale (f=310), semi-structured interview (f=245), observation (f=139) and document analysis (f=89) are the data collection tools.

According to the findings of the research, purposeful sampling was mostly used in empathy studies. Additionally, studies have mostly been conducted with adults. The most commonly used data collection tool in research was the survey.

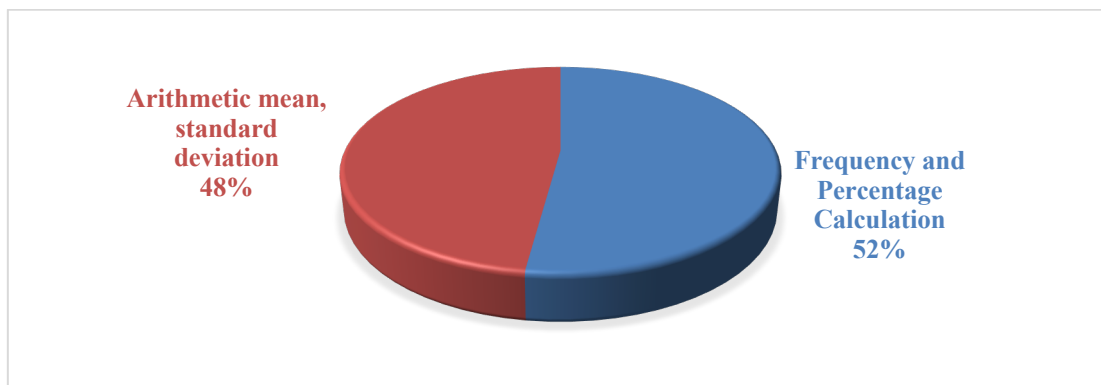
#### 4.6. Distribution of the Studies by Data Analysis

The figures 12 and 13 show the distribution of the studies according to data analysis.



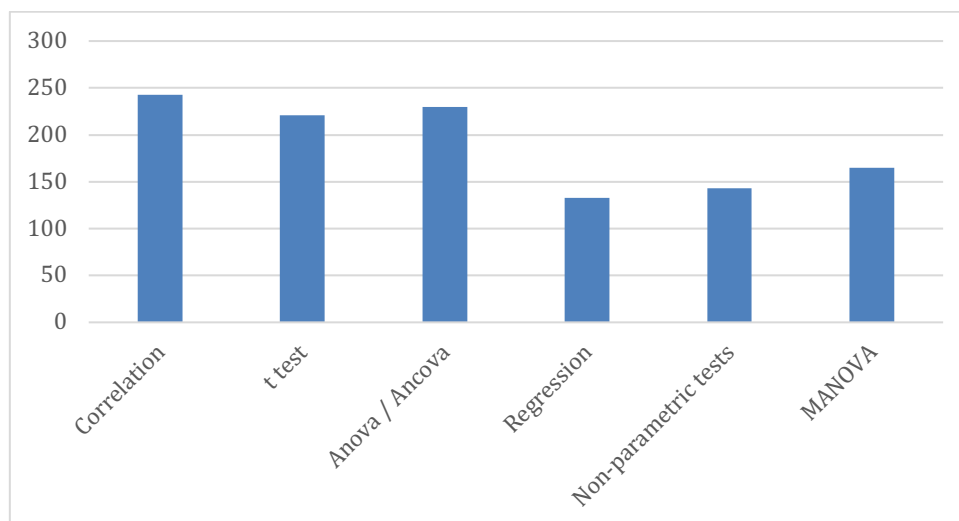
**Figure 12.** Distribution by Qualitative Data Analysis

Figure 12 shows content analysis (f=107, % 59) and descriptive analysis (f=102, %41) methods, which are among the qualitative data analysis methods, were most commonly used in the studies.



**Figure 13.** Distribution of Quantitative Data Analysis

Figure 13 shows frequency and percentage calculation (f=109, % 56), arithmetic mean and standard deviation (f=100, %44) were mostly used in quantitative data analysis and descriptive statistics calculations in the studies.



**Figure 14.** Distribution of Quantitative Data Analysis

Figure 14 shows the most common correlation (f=243) calculation was made in the predictive statistics calculation. In decreasing order, ANOVA (f=230), t-test (f=221), MANOVA (f=165), regression (f=133), and non-parametric tests (f=13) were calculated.

According to the findings of the research, in empathy studies, content analysis was mostly used in qualitative studies and correlation analysis was used in quantitative studies.

## **5. Discussion**

In this study, a bibliometric analysis of 1135 empathic/empathy articles was conducted. The findings of the study indicate that empathy-based studies have spread to different areas and that empathy-based studies are given importance.

According to the findings related to the first sub-purpose of the research, while the studies with empathy have increased from year to year, it is seen that there has been a decrease in the studies conducted as of 2014. The increase in the number of studies on empathy in these years may be due to the existence of problematic situations between patients, doctors, workers and employers, students and teachers, and peers in the fields of emotional neuroscience, psychology, medicine, and economics. As a matter of fact, (Kelly et al., 2022; Coan & Maresh, 2014) emphasized in their studies that empathic states are an emotion that helps regulate interpersonal relationships.

According to the findings related to the second sub-purpose of the research, the journal in which empathy-related studies are published the most is published in the journal *Social Cognitive*. This finding of the research is a possible outcome. Because although empathy is a word that emerges in the field of fine arts, the field in which it gains its main meaning is the science of psychology. This finding obtained from the research is compatible with the studies on empathy in the literature. We see that empathy studies are mostly addressed in a cognitive dimension, and this is related to the fields of psychology and health, where studies examining empathy from various perspectives are conducted (Farrow & Woodruff, 2007; Decety & Ickes, 2009; Coplan & Goldie, 2011; Decety et al., 2012; Coutinho et al., 2014; Decety & Fotopoulou, 2015).

According to the findings related to the third sub-goal of the study, the studies are compatible with the findings obtained from the second sub-goal. Most of the studies have been done in the field of health. In the second place came the studies carried out in psychology. In the age of developing and changing technology, people have been exposed to the educational process in which cognitive development is more considered. People's emotional development is a little behind. Unfortunately, evidence shows that empathy is declining (Konrath et al., 2011). Behavioral disorders such as peer bullying, which have emerged in the field of education in recent years, have made it necessary for empathy education to be a value and thinking skill that should be given in schools. Thus, the fields in which empathy studies were carried out the most after psychology became the field of education.

According to the fourth and fifth objectives of the research, it was observed that the studies were concentrated on quantitative research methods, and there were many studies on correlation and experimental designs. It is seen that these findings of the research are similar to the content analyzed studies in the literature (Eskici & Özsevgeç, 2019; Bekiroğlu & Ütkür-Güllühan, 2022; Seçer et al., 2014). However, this finding of the researcher revealed that there is a need for meta-analysis and meta-synthesis studies on empathy.

According to the sixth and seventh sub-objectives of the research, the sample level in the research is adults and university students. The sample size is in the range of 31-100. These findings of the study are similar to meta synthesis and meta analysis studies conducted in the literature (Bekiroğlu, & Ütkür-Güllühan, 2022; Özbey & Sarıkaya, 2019). This result of the research indicates that in studies on empathy, importance should be given to studies on young people and children.

Generally, in studies conducted in the last ten years, empathy has been viewed both as an emotion, value, and feeling both related to and independent of the main subject. The type of

empathy discussed in the studies is often not included. In addition, empathy shows that it will be a popular subject for future studies as a necessary subject for people to understand and make sense of their environment and to communicate well in the changing and developing world of technology.

Findings regarding the eighth and ninth sub-objectives of the research indicate that descriptive analysis is the most common in qualitative data analysis, and correlation and Anova calculations are the most common in quantitative data analysis.

## 6. Conclusion

The results of the research can be summarized as follows: 1) empathy studies have mostly been conducted in the field of health; 2) empathy studies have mostly been conducted with quantitative methods; 3) the samples of empathy studies are mostly adults and purposeful sampling was preferred. A survey data collection tool was most preferred in empathy studies. In qualitative empathy studies, content analysis was mostly used in data analysis, and in quantitative studies, correlation analysis was used. The results of the research show that studies on empathy and empathic thinking skills are mostly preferred in the field of health, and then spread to other branches of science and include studies that tend to solve a problem situation.

## Limitation

In this study, a bibliometric analysis of 1135 empathic articles was conducted. The limitation of the research consists of these 1135 articles accessed in WoS. As more research methods, samples, and data collection tools are developed, empathic studies can be conducted with other approaches, and thus trends, effects, and tendencies can be determined.

## Recommendation

Considering this limitation of the research, the study reached the following results:

- Meta-analysis and meta-synthesis studies are needed in studies on empathy.
- Empathy-related studies should increase at youth, adolescent, primary school and pre-school levels.
- Since there is no information about which type of empathy works in empathy-based studies, empathy studies have spread to many areas. Content analysis type studies should be conducted according to education, psychology and other fields.

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## Conflict of Interest

The Author(s) declare(s) that there is no conflict of interest.

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