





REVIEW

SCIENTIFIC PRODUCTION ON THE MENTAL HEALTH OF TRANSGENDER PEOPLE IN THE SCOPUS DATABASE: A BIBLIOMETRICS STUDY*

HIGHLIGHTS

1. The documents are available in 420 journals.
2. Eight keywords emerged as the most used.
3. The ten most productive authors come from the United States.
4. The year 2021 emerged as the most productive.

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ABSTRACT

Objective: to map scientific production on the mental health of transgender people, indexed in the Scopus database. **Method:** Bibliometric study, comprising the study of articles, including reviews, from January 2001 to June 2023, with analysis of indicators such as number of documents per year, language, journals most used, most productive authors, productivity of authors, affiliation of authorship, country of authors and keywords. **Results:** 988 documents were identified, concentrated in the years 2023 (9.8%), 2022 (17.2%), 2021 (18.8%), 2020 (12.7%), and 2019 (10.1%). The ten authors who have published the most on the subject are from the United States (90%). The journal with the highest number of articles was LGBT Health. The most used terms in the studies were: Female, Male, Transgender, Human, Humans, Adult, Transgender Persons, and Mental Health. **Conclusion:** There was a need for greater encouragement of publications in both Brazilian and international journals about the transsexual population.

DESCRIPTORS: Mental Health; Humans; Transgender Persons; Gender Identity; Bibliometrics.

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INTRODUCTION

Mental health has historically had complex concepts, directly influenced by socio-political contexts and the evolution of health practices. According to the concept currently accepted by the World Health Organization (WHO), "Health is a state of complete physical, mental and social well-being and is not merely the absence of disease or infirmity", including the physical, mental, and social aspects of everyone (1:110). To achieve the Millennium Development Goals, the WHO² stated that mental health is a critical indicator of human development and is the basis for social development, so it should be included in all public policies.

According to Brazil's Ministry of Health³, sexual orientation and gender identity are vulnerability factors for health, and, with this, it has made it possible to build a public policy to guarantee the right to health without prejudice to gender, race/ethnicity, sexual orientation, or sexual and affective practices.

Historically, in the field of psychiatry, transsexuality was seen as a disease process and was classified as a subtype of sexual identity disorder, according to the ICD-11 (Statistical Classification of Diseases and Related Health Problems, 11th Version)⁴. However, over the years and with the evolution of the sciences and social policies, concepts around mental health have been changing and bringing a new construction to a population that already exists and is becoming increasingly visible in society.

In this context, transgender or transsexual people are those whose sex assigned at birth differs from their current gender expression or identity and have high indicators of health inequalities, characterized as multifaceted and resulting from processes of socioeconomic marginalization, stigma and discrimination⁵.

Authors⁶ point out that transsexuals morphologically belong to a certain sex, but psychologically belong to the opposite sex. For the authors⁷, transsexuality can be defined as an identity experience that conflicts with gender norms based on the biological; the transsexual person claims to be recognized as a woman or a man.

The health of transsexual people is a field that needs to be explored by the various areas of health knowledge to build more scientifically based actions and improve the quality of life of this population. The aim of this research was to map scientific production about the mental health of transgender people, indexed in the Scopus database.

METHOD

This is a descriptive study, with a quantitative approach and classified as a bibliometric review, as it uses scientific production indicators, advanced text analysis and network analysis to reveal hidden patterns in the content of abstracts, regarding the relationships among terms⁸.

Bibliometric studies help to understand new themes, making it possible to identify trends for future research. They are anchored in three basic laws: Bradford's Law (which deals with the journals that publish the most on a given theme); Lotka's Law (which deals with the authors who produce the most in each area of knowledge); and Zipf's Law (which shows the correlation between the number of words in each text and the frequency of these same words)⁹⁻¹⁰.

Data collection took place in July 2023, in the Scopus database, through institutional online access to the CAPES (Coordination for the Improvement of Higher Education

Personnel) Journal Portal. The study period ran from January 2001 to June 2023, with the first publication in 2001.

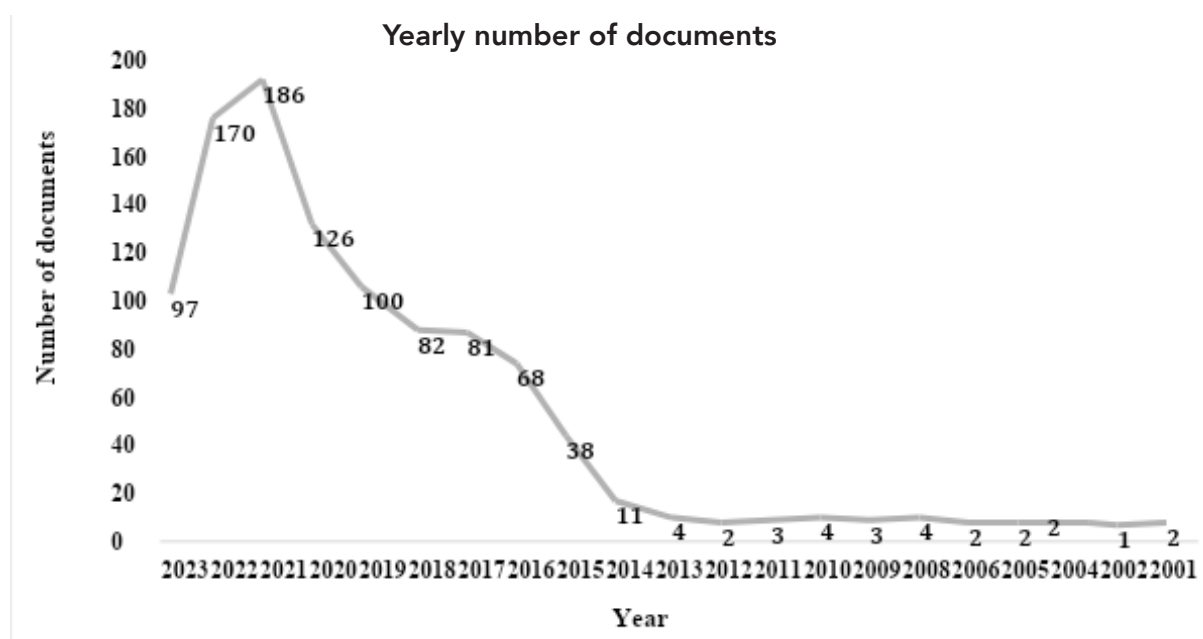
The search was carried out according to the PICo strategy, which considers: the "letter P" as the population or patient, or the problem addressed (Population/Patient/Problem); the "letter I" as the phenomenon of interest (Interest); and the "syllable Co", the context (Context) of the research, being conducted through the Health Sciences Descriptors (DeCS) and mediated by the Boolean operators "AND" and "OR", allowing an objective search. Thus, the search was carried out as follows: ("Mental Health" OR "Saúde Mental") AND ("Transgender Persons" OR "Pessoas Transgênero")¹¹⁻¹².

As for defining the criteria for including and excluding data, the previously established time frame was chosen as a refinement criterion, as was the type of document (excluding documents in the format of letters), editorial and note (notes). In addition, the advanced search tool was used to carry out the research by searching the terms present in the titles, abstracts, and keywords, resulting in a total of 1,133 documents retrieved, published between January 2001 and June 2023.

The data set was saved in a single file in CSV Excel format and analyzed using Microsoft Excel software, where descriptive statistics were used to analyze the results. Eight indicators were listed in the analysis process: 1-number of documents per year (articles and review articles); 2-language; 3-most used journals; 4-most productive authors; 5-productivity of authors (H Index); 6-author affiliation; 7-country of origin of authors; 8-keywords (most frequent themes in research). Items 5, 6 and 7 were examined in Scopus.

RESULTS

Graph 1 shows the number of annual publications found in relation to the mapping of World Scientific Production on the Mental Health of Transsexual People.



Graph 1 - Annual Distribution of the Mapping of World Scientific Production on the Mental Health of Transgender People. Belém, Pará, Brazil, 2023

Source: The authors (2023).

Although incipient, the studies tended to have two publications per year, with the years 2001, 2004, 2005, 2006 and 2012 standing out. In 2002, there was only one publication, and in 2003 and 2007, there were no documents. There were four publications in 2008, 2010 and 2013, with a fluctuation of three in 2009 and 2011. Considering only the periods from 2001 to 2013, except for the two years with no publications, there were a total of 29 (2.9%) documents indexed.

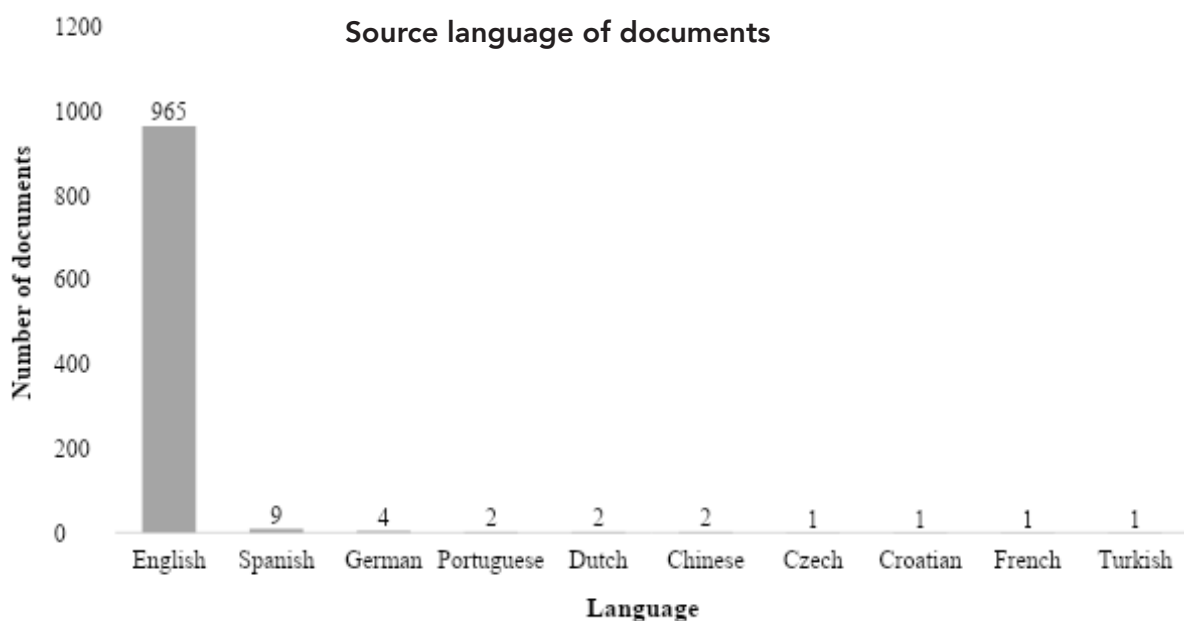
The first step in the development of publications came in the following year, when there were four papers published in 2013 and 11 (1.1%) in 2014. However, it was from 2015 onward that the timidity observed in the period from 2001 to 2013 gave way to the publications of interest to this research.

Thus, from 2015 to June 2023, publications grew significantly, amounting to 948 documents and/or 95.9% of the total. In 2015, 38 (3.8%) documents were indexed, and in 2016, 68 (6.9%) articles were published, in other words, scientific production in the area had a growth curve.

It should be noted that for two years, 2017 (8.2%) and 2018 (8.3%), the number of publications remained at 81 and 82, maintaining the linear curve. However, there was no period of decline; on the contrary, publication rates increased.

From 2019 to June 2023, sequentially, 100 (10.1%) documents were published in 2019, 126 (12.7%) in 2020, 186 (18.8%) in 2021, 170 (17.2%) in 2022, and 97 (9.8%) in 2023. Considering the period from 2014 to June 2023, the annual percentage growth found in the mapping of scientific production in Scopus on the mental health of transgender people was (97.1%), there has been progress in relation to scientific production on the subject.

The second indicator presented because of the research involving scientific production on the mental health of transgender people is the language of the documents, which is shown in Graph 2.



Graph 2 - Distribution of Languages Involving World Scientific Production on the Mental Health of Transgender People. Belém, Pará, Brazil, 2023

Source: The authors (2023).

The results show that of the 988 documents published, 965 (97.7%) were published in English. Twenty-three articles were published only in the language of the researcher's country, broken down as follows: one-nine (09) in Spanish, four (04) in German, two (02) in Portuguese, two (2) in Dutch, two (2) in Chinese, one (01) in Czech, one (1) in Croatian, one (01) in French, and, finally, one (1) in Turkish, making a total of 2.3%.

Regarding the analysis of the 988 publications found in world scientific production on the mental health of transgender people, based on the journals in which they were published, it was observed that they are disseminated in 420 different journals. This shows the applicability of Bradford's Law through zoning based on the frequency of production of the journals, with the 1st zone having 21 journals, while the 2nd and 3rd have 98 and 301, respectively.

In this context, the six journals most used to publish the documents were listed, which together contain 174 documents and/or a percentage of 17.6%. These journals are organized in Table 1 in descending order based on the frequency of documents.

Table 1 - List of the six journals most used in World Scientific Production on the Mental Health of Transsexual People. Belém, Pará, Brazil, 2023

Order	Journal	Frequency of documents	%
01	<i>LGBT Health</i>	44	4.5
02	<i>Journal of Adolescent Health</i>	37	3.8
03	<i>International Journal of Environmental Research and Public Health</i>	26	2.6
04	<i>Journal of Homosexuality</i>	24	2.4
05	<i>Archives of Sexual Behavior</i>	22	2.2
06	<i>PLoS ONE</i>	21	2.1
Total		174	17.6

Source: The authors (2023).

The journal with the highest number of documents is *LGBT Health*, with 44 documents and a percentage of 4.5%. This is followed by the *Journal of Adolescent Health* with 37 documents (3.8%); the *International Journal of Environmental Research and Public Health* with 26 (2.6%); the *Journal of Homosexuality* with 24 (2.4%); the *Archives of Sexual Behavior* with 22 (2.2%); and *PLoS ONE* with 21 articles (2.1%).

The contribution in terms of the scientific output of the authors of the set of articles analyzed in this research was 3,647 authors, of which: 2,987 authors presented only one scientific output; 417 wrote two articles; 104 produced three; 52 wrote four articles; 34 produced five articles; 14 were responsible for six documents; 17 had seven documents; five published eight documents; seven produced nine documents; three published 11 documents; two were responsible for 12 publications; one produced 14 outputs; one produced 16 documents; and a single author produced 38 outputs.

It was observed that 730 authors (20% of the 3,647) had a frequency of 2,051, corresponding to a 41.3% frequency of documents. Considering Lotka's Law, the results found are in line with Paretto's Diagram (20/80), since it was evident that certain authors

stand out in scientific production on the mental health of transgender people in relation to the others.

By analyzing the frequency of authorship, it was possible to highlight a group of authors with the highest production index. Collected directly from the Scopus database, Table 2 shows the authors' names, frequency of documents, affiliation, country, and H index.

Of the 3,647 authors, the most productive had a total of 151 documents published: thus, one author published 38 documents; one published 16; one published 14; two authors published 13 documents; two published 12; and three published 11.

Regarding country, except for Arcelus Jon, affiliated with the Hospital Universitario de Bellvitge, which is in Spain, the other most productive researchers are from the United States and are present in the largest number of publications.

However, only two of these authors belong to the same affiliation, Ann & Robert H. Lurie Children's Hospital of Chicago. The other researchers are affiliated with other research centers as described in Table 2.

Table 2 - Distribution of the number of most productive authors per document on the Mental Health of Transgender People. Belém, Pará, Brazil, 2023

Order	Author	Documents' frequency	Affiliation	Country	H Index
01	Reisner, Sari L.	38	Harvard T.H. Chan School of Public Health	United States	65
02	Keuroghlian, Alex S.	16	Massachusetts General Hospital	United States	27
03	Tangpricha, Vin	14	Emory University School of Medicine	United States	68
04	Poteat, Tonia C.	13	UNC School of Medicine	United States	32
05	Hughto, Jaclyn M. White	13	Fenway Community Health Center	United States	17
06	Operario, Don	12	Rollins School of Public Health	United States	52
07	Chen, Diane W.	12	Ann & Robert H. Lurie Children's Hospital of Chicago	United States	24
08	Garofalo, Robert	11	Ann & Robert H. Lurie Children's Hospital of Chicago	United States	42
09	Arcelus, Jon	11	Hospital Universitari de Bellvitge	Spain	42
10	Budge, Stephanie L.	11	University of Wisconsin-Madison	United States	28

Source: The authors (2023).

Chart 1 shows the zoning of the words, based on the frequency of words present

in each zone. In this way, the trivial zone is characterized by the terms most used to index the studies, this being the core, which has eight different words, which together have a frequency of occurrence of 8,406 times, representing a percentage of 24.3%.

On the other hand, the zone of interest shows the words with intermediate appearances, with 59 terms, 10,581 repetitions and a percentile of 30.6%. Finally, there is the noise zone, which denotes words used sporadically, revealing 3,391 words used 15,551 times, with a percentage of 45.1% in relation to the total frequency.

Chart 1 - Percentage of occurrences by keyword zone of scientific production on the Mental Health of Transsexual People. Belém, Pará, Brazil, 2023

Zones	Number of words	Number of Keyword Occurrences	%
Trivial	8	8,406	24.3
Interest	59	10,581	30.6
Noise	2,841	15,551	45.1
Total	3,458	34,538	100

Source: The authors (2023).

The eight terms arranged in the trivial zone according to the number of occurrences are the following: Female (1477), Male (1345), Transgender (1091), Human (948), Humans (907), Adult (905), Transgender Persons (882) and Mental Health (851).

DISCUSSION

According to the findings of the distribution of publications by year, these corroborate a study carried out in 2020 that shows an increase in productions on the health of the LGBTTI+ population in the scientific literature after the publication of the National LGBT Comprehensive Health Policy; with this, it can be inferred that this growth was influenced by the political context and the advances that this health policy represents for the social, human and sexual rights of this population¹³. It should also be noted that the emergence of the debate on the issue of sexual and gender diversity began in the 1990s and was consolidated in the 2000s by a much wider range of researchers with a broad approach to problems and interests in a universal context¹⁴.

As far as language is concerned, since the focus is on international journals and the study's database has a universal language such as English as its publication domain, it is believed that this is a determining factor as to why the majority of published studies are in English. In relation to Brazil, there are records of studies in Portuguese, showing a tendency for Brazilian authors to address the issue. The authors¹⁵ endorse the need for studies related to the universe of transsexual people in Brazil that focus on gaining a more in-depth understanding of the reality of this population, which is discriminated against and excluded from society. The data on affiliation and countries shows that the most productive authors receive support from various institutions, contributing to the realization and publication of works in the research area. In a study on the universe of scientific research on transvestites

and transsexuals¹⁶, it was noted that, internationally, there are institutional partnerships to promote research connected to the LGBT environment, unlike what is observed in Brazil with a single funder.

According to the results presented in relation to Bradford's Law, the journal with the highest number of publications was LGBT Health. However, the other productions are scattered across the 420 journals, with a core of journals that have the highest rates of document distribution being considered the most relevant in the field, as shown in Table 1, confirming the principles of Bradford's Law¹⁷.

In addition, Bradford's Law¹⁸ has a triad of zones, each of which accounts for a third of all relevant articles. The first zone has a few highly productive journals; the second contains larger numbers of journals classified as less productive; and the third has even larger numbers when compared to the second. The number of journals (n) present in the core and zones changes in the proportion of 1: n: n².

The researchers¹⁹ point out that Lotka's Law is based on the Inverse Square Law, suggesting that, when analyzing articles over a certain period, the number of people who wrote two or more articles is equal to a quarter of those who produced just one. According to the same authors, the Law shows the pattern of scientific productivity of authors and the identification of the most developed research centers, considering that a few authors are responsible for many productions and are therefore considered references in the subject addressed, while many authors have limited numbers of productions and are less prestigious in the area.

According to the findings of the study "Health of the LGBT population: an analysis of the agents, objects of interest and disputes in an emerging scientific production space"^{20:26}, it highlights that subgroups in this population are the targets of different research objects, with the central dispute remaining over the categorization by science of each of these groups.

Regarding analyzing the frequency of authorship, the H index emerged in the mid-2000s. It was proposed by the American physicist Jorge E. Hirsch, from the University of California at San Diego, to make individual evaluations more "objective". This marked the moment when scientific circles began to construct bibliometric indexes²¹. This H-index denotes equality in the number of articles "n" published by an author, and which have obtained at least "n" citations each since their publication.

The keywords found in the results are directly linked to the mental health of transgender people, whose mental health is damaged whenever they are exposed to physical or mental aggression. The authors²² state that scientific evidence in the literature suggests that between 50 and 90% of trans people will suffer verbal harassment or disrespect related to their gender identity over the course of their lives, and of this total, at least 25% will suffer physical aggression or violence due to their gender identity. In addition, these people are more likely to use tobacco, alcohol, or other substances to cope with stress and social stigma.

Bibliometrics makes it possible to evaluate the academic production of the most diverse areas of knowledge, playing a relevant role in the analysis of a country's scientific production, as it can portray the behavior and development of areas of knowledge through its indicators²³. They are therefore very useful and fruitful sources for understanding and evaluating a scientific field²⁴.

Understanding the impact of publications is a mandatory activity in the publishing world, which aims to measure the most varied types of documents in journals as well as institutional materials and books based on the use of author citations²⁵. Through databases and triangulation with other methods, bibliometric analysis enables researchers to gain a better understanding of research needs in various search areas; by measuring the productivity of research centers and knowledge production, it makes it possible to reveal

the institutions, areas and sub-areas with the greatest influence and potential in each context²³.

According to the researcher²⁶, technical, scientific, and technological developments have an impact on various social areas, especially health since there is a search for advances in improving the population's quality of life. He also says that "science is still accumulative", since researchers use previous studies to base and compare the results of their research, which is the flow of scientific communication. In addition to the unique health problems resulting from bodily transformations to align the phenotype with gender identity, trans people have high rates of psychological distress, including suicidal ideation and attempts²⁷.

A study carried out in 2017 in Rio Grande do Sul, where the authors state that the low quality of care for transsexual people is due to the lack of qualification of health professionals in the face of the demands presented by transvestites; to "insufficient reception"; to "disrespect for the rights of transvestites"; to the "lack of the necessary bond between health professional and user"; and to the "lack of programs and actions that advocate the promotion, prevention and monitoring of the health of transvestites, undermining the integrality of care and the equity of health actions"^{28: 607}.

The limitations noted in this study were pertinent to the use of search mechanisms expressed by descriptors and Boolean operators, which determine the algorithm for retrieving studies. Furthermore, the use of only one database is a limitation, as it may be related to the limited number of documents identified.

CONCLUSION

This study analyzed the articles published in journals indexed in the Scopus database, showing that publications covering the proposed theme are still limited when related to mental health. Although there are few publications in this database, they are of a high level of quality when looking at the evaluation metrics of the selected studies, highlighting that the subject is of global interest and from renowned institutions in the scientific environment.

Considering the above, the research is justified since, by using bibliometric indicators, it is possible to provide the academic world with an overview of scientific production on the subject presented, as well as guiding the scientific community in the use, application, and improvement of research in the area. The subject is of extreme social and scientific relevance, as it is necessary for the care practice of health professionals and for comprehensive care for this population.

As such, this study emerges with contributions such as the need for more publications both nationally and internationally about the transsexual population, especially regarding the mental health of these people who do not see themselves with their biological sex at birth.

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