



## Research Trends in Mental Health and the Effect on Students' Learning Disorder

**Thoriqi Firdaus**

*Natural Science Education, Universitas Negeri Yogyakarta, Indonesia*

*E-mail: [thorifirdaus.2023@student.uny.ac.id](mailto:thorifirdaus.2023@student.uny.ac.id) ORCID ID: <https://orcid.org/0009-0005-2340-8468>*

**Endah Nuryanti**

*Natural Science Education, Universitas Trunojoyo Madura, Indonesia*

*E-mail: [210641100090@student.trunojoyo.ac.id](mailto:210641100090@student.trunojoyo.ac.id) ORCID ID: <https://orcid.org/0009-0005-3615-0873>*

**Novia Rabiatal Adawiyah**

*Natural Science Education, Universitas Trunojoyo Madura, Indonesia*

*E-mail: [200641100040@student.trunojoyo.ac.id](mailto:200641100040@student.trunojoyo.ac.id) ORCID ID: <https://orcid.org/0009-0006-5799-4255>*

**Dian Inka Sari**

*Natural Science Education, Universitas Trunojoyo Madura, Indonesia*

*E-mail: [210641100063@student.trunojoyo.ac.id](mailto:210641100063@student.trunojoyo.ac.id) ORCID ID: <https://orcid.org/0009-0006-4939-7442>*

**Fatiratur Rahmah**

*Natural Science Education, Universitas Trunojoyo Madura, Indonesia*

*E-mail: [210641100095@student.trunojoyo.ac.id](mailto:210641100095@student.trunojoyo.ac.id) ORCID ID: <https://orcid.org/0009-0007-5837-4055>*

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<p><b>Abstract</b></p> <p><b>Background and Aim:</b> Student learning issues have emerged as a complex problem, with mental health being one of its contributing factors. The objective of this research is to identify patterns and trends in mental health within the educational sector, thereby understanding its correlation and impact on student learning disorders.</p> <p><b>Materials and Methods:</b> This quantitative study employs two designs: bibliometric analysis and Ex Post Facto design. The Ex Post Facto design utilizes correlation analysis and multiple linear regression. The bibliometric analysis uses the Scopus database from 2014 to 2023 with the keywords "Student Mental Health" AND "Education". The Ex Post Facto design, on the other hand, utilizes secondary data from the Indonesian Central Bureau of Statistics (BPS). The findings indicate a significant upward trend in the number of articles since 2014.</p> <p><b>Results:</b> Wang Y emerges as the most relevant author, with China being the leading country in publications. The most cited work is by Browning Mhem, 2021, with 485 citations. The primary focus of the research is on mental health, with students being the dominant target group. The prevalence of mental disorders and learning disorders is highest among the 25-29 age group. The percentage of mental disorders and learning disorders is higher in males compared to females. Individuals residing in urban areas exhibit a higher prevalence of mental disorders and learning disorders compared to those in rural areas. The age range has a moderately negative impact on learning disorders. Place of residence has a moderately positive but non-significant impact on learning disorders. Mental disorders, however, have a very strong and significant impact on learning disorders. Gender is excluded as a variable and not included in the regression model.</p> <p><b>Conclusion:</b> The significant impact of mental disorders on learning disorders indicates the necessity for comprehensive interventions addressing both issues.</p> <p><b>Keywords:</b> Trends, Mental Health, Learning Disorder</p>		

### Introduction

Student learning issues have become a complex topic influenced by various factors. Mental health is a crucial variable in the learning problems experienced by students (Markoulakis & Kirsh, 2013). Mental health is an integral part of discussions in the education sector because mental health issues such as anxiety disorders, depression, and stress are prevalent among students and can affect their quality of life and academic performance (Bolinski et al., 2020). Students with mental health conditions implicitly acknowledge that this has become a public concern (Okoro et al., 2022). This fact presents substantial challenges in the academic field (Schleider et al., 2020).





Students, as academic actors, are vulnerable to mental health issues (Jessiman et al., 2022). Radical social development can lead to mental health symptoms such as anxiety, sadness, irritability, and aggressiveness (Zapata-Ospina et al., 2021). Active participation in school culture plays a vital role in intervening in open policies to promote mental health (Jessiman et al., 2022). It is because good mental health conditions can make students more focused, motivated, and capable of overcoming various academic challenges they face.

Students with good mental health tend to have better concentration and focus abilities (Duraku & Hoxha, 2020). It is because they can effectively engage in learning and easily comprehend the material. Conversely, students with mental health issues will experience anxiety and often struggle to concentrate on their studies (Tinklin et al., 2005). Moreover, mental health also impacts students' learning motivation (Van, 2023). Students who feel happy while studying are more likely to be motivated to learn and achieve academic goals (Brophy, 1983).

Mental health significantly influences students' ability to interact socially (Krish et al., 2016). Students with positive social relationships often feel supported and motivated, whereas social anxiety can hinder students from interacting, thus affecting their academic performance (Wentzel & Wigfield, 1998). Additionally, anxiety affects emotional well-being (Jorm et al., 2003). Students with emotional well-being are more likely to manage stress and academic pressure (Tharani et al., 2017). They can face challenges and failures with a positive attitude. On the other hand, students with mental health problems (Beiter et al., 2015) experience excessive anxiety and increased stress, making them more vulnerable to academic pressure. Therefore, it is necessary to study and analyze current patterns and trends in mental health.

Trends in literature related to mental health can be explored through a bibliometric approach to connect a clinical overview of the issue (Cao et al., 2021). This approach allows the study to map past trends, evaluate effective patterns, and predict the direction of the future, as well as more productive and relevant research (Cao et al., 2021). Systematic literature reviews construct explicit evidence in a structured manner (Borghouts et al., 2021). This method allows for the analysis of the strengths and weaknesses of the intervention approaches used. In addition to understanding research trends regarding mental health interventions in education, it is essential to analyze several variables that affect mental health, which also impact learning difficulties.

Mental health can be influenced by factors such as age range (Feehan et al., 1993; Gonzales et al., 2011), gender (Rosenfield & Mouzon, 2013), and place of residence (Kiani et al., 2013). These factors affect not only mental health but also students' learning problems. Understanding the interaction between these factors is crucial for designing effective and inclusive educational strategies and mental health support. Therefore, collaboration between approaches is needed to consolidate the complexity of studies on mental health issues in a holistic and informed manner. It also helps in determining priority interventions that have the potential to improve students' mental well-being significantly.

The combination of bibliometric approaches, correlation analysis, and multiple linear regression analysis systematically provides valuable insights to support mental health. The objective of this research is to identify patterns and trends in mental health within the educational sector to understand the correlation and its impact on students' learning difficulties. This research can influence educational policy and clinical implementation, thereby extending mental health service coverage comprehensively within educational environments. This study is expected to enhance understanding and support students' mental health.

## Mental Health

The term "mental health" has evolved from the earlier term "mental hygiene," which was first associated with William Sweetzer in 1843. Mental health has been taught in schools. In 1893, the founder of the American Psychiatric Association, Isaac Ray, defined mental health as the art of keeping the mind from various events and influences that can degrade its quality, weaken its energy, and disrupt activity or movement. In other words, maintaining a healthy mind involves efforts to protect it from stress, trauma, and negative factors that can adversely affect mental well-being (Block, 2016).





Isaac Ray also emphasized that mental health management involves managing bodily strength through sufficient rest, exercise, and healthy eating, as well as dressing appropriately and adapting to the climate. Ray also focused on the importance of reproductive health and family welfare. Furthermore, Ray stressed the control of impulses to manage urges and desires, empathy towards emotions and opinions to respect others' feelings and views, and intellectual discipline to think logically and critically (Block, 2016).

The World Health Organization (WHO) defines mental health as a state of well-being in which an individual realizes their abilities, can cope with the normal stresses of life, works productively and fruitfully, and can contribute to their community (Lara-Cabrera et al., 2020). This WHO definition encompasses several crucial aspects, such as self-awareness, the ability to manage stress, productivity, and social contribution, which play a role in mental well-being. In 1958, Marie Jahoda, a psychologist who played a significant role in developing the concept of mental health, outlined six internal processes that support better mental health. These processes include self-affection, which provides a positive view of oneself; personal growth, which involves efforts to develop potential and new experiences and learning; integration of psychological functions, which balances various personality and emotional aspects, allowing one to manage internal and external conflicts and maintain emotional stability; autonomy; accurate perception of reality; and good environmental mastery (Doyle et al., 2023).

In 1908, psychiatrist Adolf Meyer developed the concept of mental hygiene by linking the origins of mental illness to biological or pathological factors. The interrelation of neurological, biological, and physiological fields provides a scientific understanding of mental illness. In 1909, Meyer, William James, Clifford Beers, and psychologist William James formed the National Committee for Mental Hygiene (George et al., 2023).

Penney and Stastny (2008) conceptualized that in the early 19th century, the concept of mental illness was often equated with demonic possession or moral deviation. Individuals deemed "insane" were treated very poorly and believed to be incapable of reasoning. People with mental disorders were often treated as threats that needed to be subdued rather than as individuals requiring medical care (George et al., 2023).

## Methodology

This research is quantitative, employing two designs: bibliometric and Ex Post Facto. The bibliometric analysis aims to analyze scientific literature to evaluate research trends, patterns, and impact. The Ex Post Facto design aims to explore causal relationships from existing data without manipulating variables. The Ex Post Facto design utilizes correlation analysis and multiple linear regression to understand the relationships and effects between variables.

### Bibliometric Analysis

Bibliometric analysis comprises a set of statistical and mathematical methods used to measure and analyze the quality and quantity of articles and other publications (Durieux & Gevenois, 2010). Bibliometric research serves as an objective tool for scientific literature through a transparent, systematic, and reproducible quantitative literature review approach (Buyukkidik, 2022). The purpose of utilizing bibliometric analysis in this research is to evaluate trends, patterns, and the impact of studies on student mental health in education. The bibliometric analysis in this research follows three steps: defining the objective, selecting the sample, and conducting statistical analysis.

### Defining the Objective

Bibliometric analysis techniques are categorized into primary techniques and supplementary techniques. Primary techniques include performance analysis (metrics related to publications, citations, and their intersection) and science mapping (including citation analysis, co-citation analysis, bibliometric coupling, co-word analysis, and co-authorship analysis). Supplementary techniques consist of network analysis (encompassing network, metric, clustering, and visualization) (Donthu et al., 2021). Bibliometric analysis has several quantitative characteristics of a publication, including citation analysis, co-citation analysis, co-author analysis, co-word analysis, and bibliometric coupling analysis. Citation analysis assesses the effectiveness of authors, documents, and journals by considering their citation rates. Co-citation analysis measures the frequency with which other





documents cite two documents together. Co-author analysis examines the relationships between authors based on their co-authorship of publications. Co-word analysis identifies patterns and relationships between words or phrases that frequently appear together in a set of documents. Bibliometric coupling occurs when two documents reference one or more of the same sources in their bibliographies.

### Selecting the Sample

The data source for this research comprises documents from the Scopus database discussing student mental health in education. The document selection is limited to the past ten years, from 2014 to 2023. The choice of the Scopus database is based on its extensive geographical and thematic coverage (Dindorf et al., 2022). Sample selection involves using article titles, abstracts, and keywords with the terms "Student Mental Health" AND "Education" or using the query (TITLE-ABS-KEY("Student Mental Health") AND TITLE-ABS-KEY(education)) AND PUBYEAR > 2013 AND PUBYEAR < 2024.

Based on the results obtained from 2014 to 2023, 1,037 research documents were published in Scopus. However, this bibliometric research is limited to documents in the form of articles and journal sources, resulting in 760 documents exported in BibTeX format. Before entering the analysis process, seven articles that did not meet the bibliometric metadata requirements were eliminated, leaving 753 articles to be analyzed.

Table 1. Completeness of bibliographic metadata

MD	Description	MD	MS %	Status
AU	Author	0	0.00	Excellent
DT	Document Type	0	0.00	Excellent
SO	Journal	0	0.00	Excellent
LA	Language	0	0.00	Excellent
PY	Publication Year	0	0.00	Excellent
TI	Title	0	0.00	Excellent
TC	Total Citation	0	0.00	Excellent
AB	Abstract	3	0.40	Good
C1	Affiliation	7	0.93	Good
DI	DOI	46	6.11	Good
RP	Corresponding Author	75	9.96	Good
DE	Keywords	107	14.21	Acceptable
ID	Keywords Plus	358	47.54	Poor
CR	Cited References	753	100.00	Completely missing
WC	Science Categories	753	100.00	Completely missing

### Statistical Analysis

This research utilizes the R Studio software through the Biblioshiny interface to conduct bibliometric analysis. Biblioshiny is a free web-based interface that operates on the R system (R Core Team, 2021). Comprehensive information about the R programming language can be accessed by referring to the introductory documents developed by Venables, Smith, and the R Development Core Team (2021). Once the R programming language is obtained, the next step involves downloading R Studio, which is available online at no cost. After installing R Studio, the command `install.packages("bibliometrix")` requires an internet connection to execute. Subsequently, the bibliometrix package is activated using the `library("bibliometrix")` command. Additionally, the `biblioshiny()` command is entered and executed to launch the user-friendly interface.

### Correlation and Multiple Linear Regression

The data utilized in this study comprises the latest secondary data from the Indonesian Central Statistics Agency, specifically from the data services section, published in 2022. The research data indicators are measured in units of individuals, with a data update frequency of more than two years,



ensuring the data is the most current available. The research subjects pertain to population and immigration, encompassing all individuals residing within the territory of the Unitary State of the Republic of Indonesia for one year or more or those residing for less than one year but intending to stay for one year or more.

Correlation analysis is a statistical method employed to evaluate the relationships between research variables. Data correlation signifies a change in the magnitude of one variable corresponding to a change in the magnitude of another variable, either in the same direction (positive correlation) or in the opposite direction (negative correlation) (Schober et al., 2018). The correlation analysis utilized in this study is Pearson's correlation, as the data follows a normal distribution, verified through the Kolmogorov-Smirnov test. Meanwhile, multiple linear regression analysis is a statistical method used to determine the influence of several independent variables on a dependent variable (Schober & Vetter, 2021).

## Results

### 1. Bibliometric mapping of extant studies

#### *Descriptive Analysis: Evolution of Publications and the Most Globally Cited Articles*

An initial step in identifying research trends is to examine the annual increase in publication numbers. The volume of research on student mental health within education saw an upsurge in 2014, 2015, 2016, 2017, 2019, 2020, 2021, and 2022, while it experienced a decline in 2018 and 2023. The frequency of scientific research outcomes conducted from 2014 to 2023 is illustrated in Figure 1.

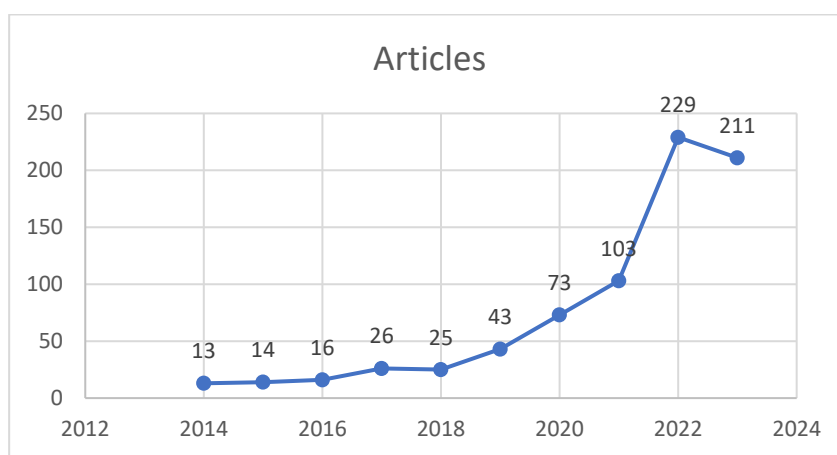


Figure 1. Annual Scientific production

Based on the graphical representation, it can be discerned that the highest number of research publications occurred in 2022, with a total of 229 articles. The publication count from 2012 to 2016 remained relatively low and stable. A gradual increase in the number of published articles was observed during the 2017-2019 period, indicating a rising trend in publications. The period from 2020 to 2022 witnessed a significant surge in the number of published articles, suggesting a substantial increase in publication productivity during this time frame. However, in 2023, the number of articles slightly decreased to 211 compared to 2022. Despite this decline, the number of published articles remained high compared to previous years.

Overall, the number of published articles has shown a significant upward trend since 2014, with the most notable surge occurring between 2020 and 2022. This graph reflects a notable increase in publication productivity or interest in recent years, peaking in 2022. The distribution of publication numbers is closely related to the citation rates observed each year. The average citation rate for research conducted between 2014 and 2023 can be found in Table 2.



Table 2. Average citation per year

Year	MeanTCperArt	N	MeanTCperYear	CitableYears
2014	61,62	13	5,60	11
2015	41,57	14	4,16	10
2016	14,88	16	1,65	9
2017	10,92	26	1,36	8
2018	15,00	25	2,14	7
2019	17,63	43	2,94	6
2020	16,53	73	3,31	5
2021	20,98	103	5,24	4
2022	7,12	229	2,37	3
2023	2,87	211	1,44	2

The number of citations an article receives is regarded as a precise indicator for identifying publications with a substantial impact in a research field (Merigo et al., 2015). Identifying the average citations of articles over the past decade, along with the most frequently cited works, reveals the significance of such research. It indicates that the article plays a crucial role in the advancement and understanding of mental health research. An article with a high number of citations signifies strong relevance to the research domain and contributes significantly to solving the addressed issues, thereby playing an essential role in generating discoveries.

The highest Mean Citations per Article (MeanTCperArt) was recorded in 2014, with an average of 61.62 citations. It may suggest that more recent articles have had less time to accumulate citations compared to older articles. The average citations per year show fluctuations. In 2014, the average number of citations per year stood at 5.60, which is relatively high. However, this value declined to 1.36 in 2017 and then increased again in 2021 to 5.24 citations per year.

#### *Citation Source Analysis and Local Impact*

The number of citations an article receives is clearly influenced by the journal in which it is published. High-reputation journals with a large readership are often chosen for citation due to their perceived credibility. Data on the most relevant sources in mental health research can be observed in Figure 2, while the Source's Local Impact is detailed in Table 3.

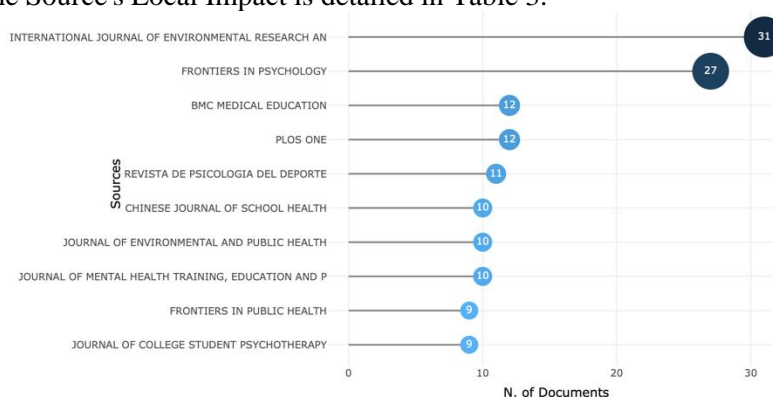


Figure 2. Most relevant sources

Figure 2 indicates that the most relevant source in research on student mental health in education is the International Journal of Environmental Research and Public Health, which boasts the highest number of documents at 31. The second position is held by Frontiers in Psychology, which has 27 documents. These two journals significantly dominate the field with considerably more publications than other sources. Although these two journals stand out, several other journals also contribute a substantial number of publications, indicating a variety of relevant sources within this field. The titles of these journals reflect the diversity of related disciplines, including environmental health,



psychology, medical education, school health, and mental health. This chart aids in identifying the journals most frequently used or cited in related research, offering insights into the sources that exert substantial influence in the academic literature on this topic. The Source Local Impact is detailed in Table 3.

Table 3. Source Local Impact

Source	h_index	g_index	m_index	TC	NP
International Journal of Environmental Research and Public Health	10	18	1,429	353	31
Bmc Medical Education	9	12	1,286	257	12
Plos One	7	12	1	756	12
Bmc Public Health	6	7	0,667	147	7
Frontiers in Psychology	6	11	1	146	27
Bmc Psychiatry	5	7	0,455	172	7
International Journal of Mental Health Nursing	5	6	0,714	87	6
Journal of College Student Psychotherapy	5	9	0,455	139	9
Journal of Mental Health Training, Education and Practice	5	7	1	50	10
Nurse Education Today	5	7	0,556	72	7

Based on Figure 2 and Table 3, it is indicated that the International Journal of Environmental Research and Public Health is the journal source with the strongest and highest metrics among the nine other journals. It implies that the journal is frequently accessed and cited. It addresses primary topics related to the environment and public health, encompassing various aspects such as global health, mental health, and health-related quality of life. The BMC Medical Education and PLOS One journals are categorized as high-impact sources with strong metrics, playing a crucial role in research focused on health professionals and original research irrespective of novelty.

The BMC Public Health and Frontiers in Psychology journals focus on social factors influencing health and psychology, thus directly impacting mental health. Both journals have strong metrics despite differing focuses. The BMC Psychiatry journal concentrates on topics such as psychiatric disorders, psychosocial factors, genetics, and epidemiology, while the International Journal of Mental Health Nursing centers on the latest developments in mental health nursing.

The Journal of College Student Psychotherapy focuses on contemporary issues in college student mental health. The Journal of Mental Health Training, Education, and Practice addresses critical issues in education and the development of health education philosophy globally, as well as the training of expert mental health workers. The Nurse Education Today journal is more focused on nursing education, midwifery, and professional health nursing globally, covering educational theories, evidence-based processes, and health education philosophy. These three journals are ranked among the bottom three, but this does not affect the quality of their articles as they continue to address essential mental health knowledge. The source production over time of the top 10 journals with the highest publication counts and strong metrics is illustrated in Figure 2.

#### *Collaboration Analysis: Countries and Authors*

Co-authorship analysis is increasingly employed in contemporary research. This analysis reveals leading scientists and organizations and serves as a powerful tool for assessing existing collaboration trends. The co-authorship analysis to identify the most relevant authors in this research is presented in Table 4.

Table 4. Most relevant authors

Authors	Articles	Articles Fractionalized
WANG Y	9	3,69





Authors	Articles	Articles Fractionalized
LIU X	7	3,48
BARKHAM M	6	1,26
BROGLIA E	6	1,26
ZHANG H	6	3,07
ZHANG Y	6	1,63
LI M	5	0,73
LIU H	5	1,34
WANG L	5	1,82
WEI Y	5	1,19

Table 4 presents the ten most relevant authors over the past decade (2014 – 2024). Wang Y ranks at the top with nine articles, while the remaining nine authors each have at least five published articles. It indicates their heightened sensitivity to mental health issues among students. Additionally, Wang Y also has the highest fractionalization value at 3.69, followed by Liu X with 3.48. Zhang H has six articles with a fractionalization value of 3.07, demonstrating significant contributions to collaboration. Other authors have lower fractionalization values, such as Barkham M and Broglia E, both at 1.26, despite having the same number of articles.

The data shows that not all authors contribute equally to each article. For instance, Barkham M and Broglia E each have six articles, but their fractionalization values are only 1.26, suggesting that they likely collaborate with many other authors on each article. Conversely, Wang Y and Liu X have relatively high fractionalization values compared to their number of articles, indicating greater contributions or fewer collaborators per article.

Authors with high fractionalization values relative to their number of articles, such as Wang Y, Liu X, and Zhang H, may contribute more significantly to each article or work within smaller teams. Authors with low fractionalization values, such as Li M and Wei Y, may work in larger teams; thus, their contributions to each article are smaller. This implies that authors frequently collaborate with others and may focus on large or multidisciplinary projects. In contrast, authors with significant contributions (high fractionalization values) can be considered leaders in their field due to their greater input into each article they write.

Co-authorship analysis correlates with country production, and most cited productions. Participation from countries in the 753 studies published in the Scopus database over the past decade is crucial, as it relates to the challenges and sensitivities these countries face regarding mental health issues among students. The relationship between country production and the most cited productions is presented in Table 5, Figure 3, and Table 6.

Table 5. Corresponding author's countries

Country	Articles	Articles %	SCP	MCP	MCP %
China	159	21,1	134	25	15,7
USA	117	15,5	106	11	9,4
United Kingdom	92	12,2	79	13	14,1
Canada	48	6,4	45	3	6,3
Australia	38	5	34	4	10,5
Brazil	14	1,9	12	2	14,3
Malaysia	14	1,9	9	5	35,7
Ireland	13	1,7	11	2	15,4
Iran	12	1,6	12	0	0
Indonesia	8	1,1	6	2	25





CHINA has the highest number of articles, with 159 articles (21.1% of the total articles). The USA ranks second with 117 articles (15.5% of the total articles). The UNITED KINGDOM has 92 articles (12.2% of the total articles). Other countries have smaller contributions, with INDONESIA contributing eight articles (1.1% of the total articles). It aligns with CHINA, which has 134 domestic publications (SCP) and 25 international publications (MCP), with an MCP of 15.7%. The USA has 106 domestic publications (SCP) and 11 international publications (MCP), with an MCP of 9.4%. The UNITED KINGDOM has 79 domestic publications (SCP) and 13 international publications (MCP), with an MCP of 14.1%. The country with the highest MCP percentage is MALAYSIA at 35.7%, while IRAN has an MCP of 0%, indicating all publications are domestic.

CHINA and the USA dominate in terms of the number of articles, reflecting high research activity and likely significant investment in research and development. The UNITED KINGDOM also makes a substantial contribution, ranking third in the number of articles. MALAYSIA has the highest MCP percentage (35.7%), indicating that researchers in Malaysia frequently collaborate with researchers from other countries, possibly as a strategy to enhance research quality through international collaboration. INDONESIA also has a relatively high MCP percentage (25%), showing a similar tendency towards international collaboration. On the other hand, IRAN has an MCP of 0%, indicating that all research is conducted domestically without international collaboration, which could reflect challenges or barriers to cross-country collaboration.

Most countries have a majority of domestic publications (SCP), such as CHINA with 84.3% SCP and the USA with 90.6% SCP. A high level of domestic publications suggests strong in-country research capacity and possibly supportive policies for domestic research. Countries like Canada, Australia, and Brazil have made significant contributions to the field of articles in both domestic and international publications. These countries also exhibit varying MCP percentages, reflecting different levels of international collaboration. In addition to the analysis of corresponding authors' countries, the analysis of countries' scientific production is illustrated in Figure 3.

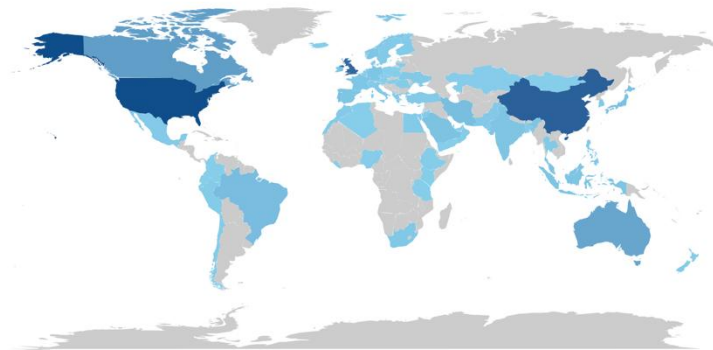


Figure 3. Countries scientific productions

Figure 3 displays a world map with varying colors assigned to countries across the globe. These colors appear to represent the level of scientific or research output from each country. Countries shaded in dark blue, such as the United States and China, indicate extremely high levels of scientific production. Countries in light blue exhibit moderate levels of scientific output. Conversely, countries colored in gray either lack data or exhibit very low or negligible levels of scientific production. The most cited countries are detailed in Table 6.

Table 6. Most cited countries

Country	TC	Average Article Citations
USA	1881	16,10
UNITED KINGDOM	1576	17,10
CANADA	676	14,10
CHINA	582	3,70



Country	TC	Average Article Citations
PHILIPPINES	576	115,20
AUSTRALIA	542	14,30
SAUDI ARABIA	188	23,50
SPAIN	165	27,50
BRAZIL	155	11,10
IRELAND	140	10,80

Table 6 presents the top 10 countries contributing to citations of research on mental health issues among students. The USA leads with the highest number of citations, totaling 1,881. China, despite being the top contributor of research articles, ranks fourth with 582 citations. It suggests that research articles originating from the USA are considered more relevant compared to those from China..

#### *Development of Mental Health Research Issues*

The most cited research articles indicate the significance of their findings in advancing the field of mental health issues. The top 10 most cited documents are presented in Table 7.

Table 7. Most cited document

Paper	DOI	Total Citations	TC per Year	Normalized TC
Browning Mhem, 2021	10.1371/journal.pone.0245327	485	121,25	23,12
Davies Eb, 2014	10.2196/jmir.3142	321	29,18	5,21
Baloran Et, 2020	10.1080/15325024.2020.1769300	289	57,80	17,48
Slavin Sj, 2014	10.1097/ACM.0000000000000166	276	25,09	4,48
Barrot Js, 2021	10.1007/s10639-021-10589-x	256	64,00	12,20
Chen T, 2022	10.1371/journal.pone.0262562	173	57,67	24,30
Ketchen Lipson S, 2015	10.1080/07448481.2015.1040411	141	14,10	3,39
Kulsoom B, 2015	10.2147/NDT.S83577	138	13,80	3,32
Elharake Ja, 2023	10.1007/s10578-021-01297-1	120	60,00	41,85
Baltà-Salvador R, 2021	10.1007/s10639-021-10593-1	106	26,50	5,05

The document with the highest total citations is the work by Browning Mhem, 2021, with 485 citations. Other documents also exhibit significant citation counts, with Davies Eb, 2014 accumulating 321 citations and Baloran Et, 2020 amassing 289 citations. Furthermore, Browning Mhem, 2021, boasts the highest number of citations per year at 121.25. Baloran Et, 2020 and Chen T, 2022 also demonstrate high citations per year, with 57.80 and 57.67, respectively. Elharake Ja, 2023, although recently published, shows a remarkable 60.00 citations per year despite having fewer years for citation accrual. Notably, Elharake Ja, 2023, has the highest normalized citations at 41.85, indicating substantial impact within a relatively short timeframe. Chen T, 2022 has normalized citations of 24.30, also reflecting significant influence. Browning Mhem, 2021 possesses normalized citations of 23.12. Documents with high total citations and high citations per year, such as Browning Mhem, 2021 and Baloran Et, 2020, signify a considerable impact within the scholarly community. Elharake Ja, 2023 demonstrates an exceptional impact despite its recent publication, as evidenced by its high normalized citation value. It underscores the research's relevance and influence in its field.

Earlier publications like Davies Eb, 2014 and Slavin Sj, 2014, although possessing high total citations, exhibit lower citations per year compared to more recent documents. It may indicate that these documents have reached their peak influence and are now experiencing a decline in annual citations. Conversely, newer documents such as Chen T, 2022 and Elharake Ja, 2023 show potential for continued high citation rates due to their current relevance and significant impact. The most cited



documents are closely related to the development of mental health issues over the past decade, as illustrated in Figures 4 and 5.



Figure 4. Wordcloud

The word cloud depicted in Figure 4 underscores a primary focus on mental health, particularly with humans as research subjects. Students emerge as the dominant target group, with a specific emphasis on gender differences, such as males and females, as well as various age groups, including young adults, adolescents, and adults. Frequently recurring related topics encompass education, indicating a correlation between mental health and the educational environment or educational outcomes. Additionally, psychology constitutes a significant component of this research. Specific mental health issues like depression and anxiety are extensively discussed. In the research context, terms such as cross-sectional studies and controlled studies are frequently mentioned, reflecting the types of studies conducted. The impact of the COVID-19 pandemic is also prominently visible with the appearance of terms like COVID-19 and coronavirus disease 2019.

From the perspective of publication and research, terms like articles and studies indicate the context of academic papers or research studies. The methodologies employed often involve questionnaires and surveys. Therefore, the word cloud as a whole represents a body of research centered on mental health, particularly among students and various age groups, with a special focus on issues such as depression and anxiety. These studies are typically published as academic articles, employing questionnaire and survey methods, and they strongly encompass educational and psychological aspects. The COVID-19 pandemic has also significantly impacted the research topics discussed. It can also be analyzed based on the research trend topics illustrated in Figure 5.

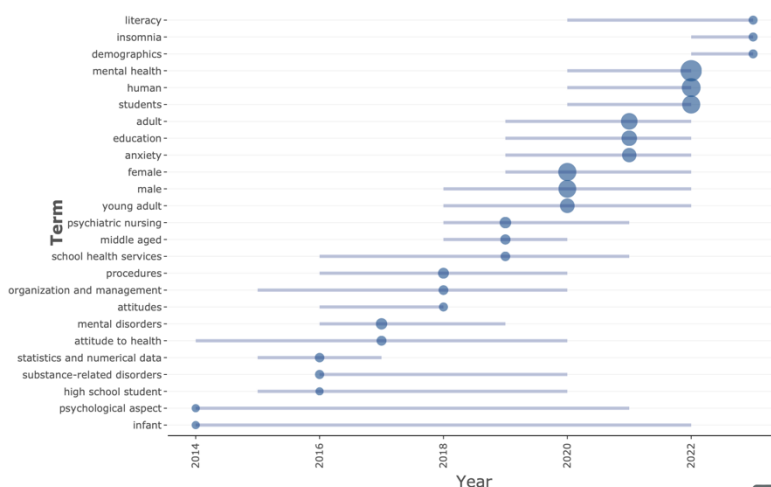


Figure 5. Trend topics

Figure 5 illustrates the evolution of mental health issues that have captured scholarly attention over the past decade. The trending topics provide insights into the changing focus within the field of

mental health research. In 2014, the research primarily concentrated on the psychological aspects of infants, with both "infant" and "psychological aspect" appearing frequently, each with a count of 5. Additionally, there was notable attention to "attitude to health," which appeared 14 times. By 2015, the emphasis shifted towards data and management within the context of mental health. Topics such as "statistic and numerical data" were discussed ten times, "high school student" appeared five times, and "organization and management" was mentioned 12 times. In 2016, the focus broadened to include various disorders and procedural aspects. "Substance-related disorders data" was a key topic with a frequency of 8, "mental disorder" was prominently featured with 36 mentions, "procedures" appeared 27 times, "attitudes" were discussed seven times, and "school health services" had a frequency of 11. The year 2018 saw a significant rise in discussions surrounding demographics and specific groups. "Psychiatric nursing" was mentioned 38 times, "middle-aged" appeared 28 times, "male" was a major topic with 282 mentions, and "young adult" was featured 129 times. In 2019, the focus shifted towards gender and educational aspects of mental health. "Female" appeared 297 times, "adult" was mentioned 217 times, "education" had a frequency of 164, and "anxiety" was discussed 119 times. The year 2020 marked an increased emphasis on inclusive topics within mental health. "Mental health" itself was the most discussed topic with 513 mentions, followed by "human" with 338 mentions, "students" with 296 mentions, and a lesser focus on "literacy," which appeared seven times. By 2022, the research spotlighted specific conditions and demographic factors, with "demographics" and "insomnia" each being mentioned seven times. These evolving trends in mental health research topics are interconnected with the co-occurrence network depicted in Figure 6, highlighting the relationships between different research themes and their development over time.

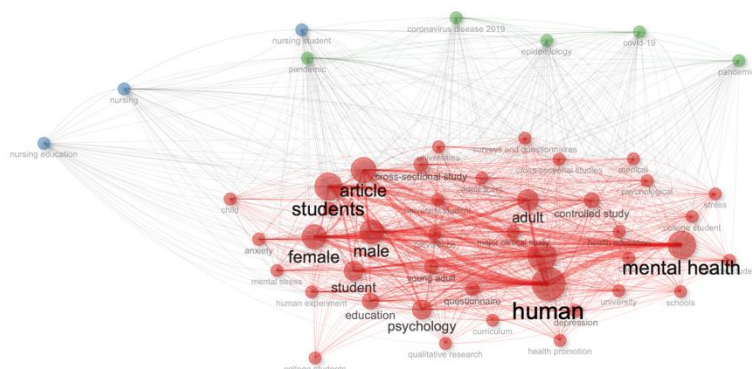


Figure 6. Co-occurrences network

Figure 6 illustrates a semantic network that delineates the interconnections between concepts in mental health issues. These concepts are clustered and color-coded for differentiation. The first cluster, colored red, comprises 41 items. The second cluster, colored blue, contains three items. The third cluster, colored green, consists of 5 items.

Each node in the network represents a specific keyword or topic, with the size of the node indicating the frequency or significance of the keyword within the dataset. Larger nodes represent keywords that appear more frequently or are more important within the network context. Red nodes signify highly frequent and closely related keywords. The green nodes, located at the top right, appear more isolated from the main group, suggesting a cluster of related but less densely connected keywords. The blue nodes, positioned at the top left, also seem separate from the main cluster.

Edges connect nodes that are related or frequently co-occur in the dataset. The thickness and intensity of the edges likely indicate the strength of the relationship between the two nodes. Areas with many interconnecting lines suggest that the topics in that area are highly related to each other. From this visualization, it can be concluded that there are several main research topic clusters with strong interconnections, with some clusters more focused on specific fields such as mental health, education, and epidemiology. Additionally, the co-occurrence network shown in Figure 6 is related to the

collaboration network depicted in Figure 7, highlighting the collaborative relationships and their influence on research trends.

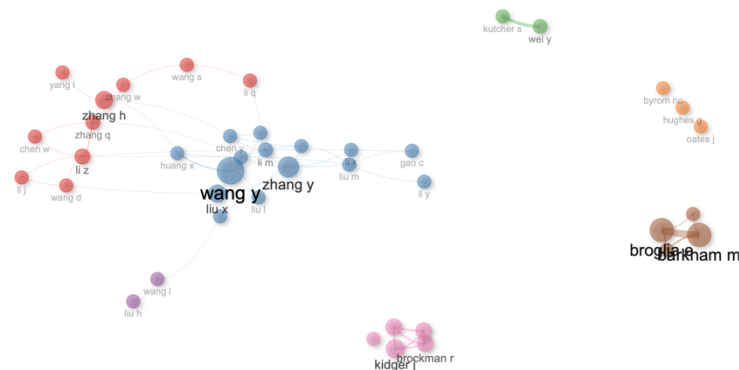


Figure 7. Collaboration network

Figure 7 refers to the collaborative network depicting the cooperation among researchers in mental health issues. Each node represents an author, while the size of the node indicates the level of contribution or involvement of that author within the network. Larger nodes denote authors with higher contributions or greater involvement. Nodes of different colors indicate groups or clusters of authors who frequently collaborate.

The first cluster, colored red, consists of 10 items. The second cluster, colored blue, comprises 15 items. The third cluster, colored green, contains two items. The fourth cluster, colored purple, also includes two items. The fifth cluster, colored orange, has three items. The sixth cluster, colored brown, consists of 4 items. The seventh cluster, colored pink, includes five items.

Edges connect authors who have collaborated on one or more publications. The thickness of the edges likely represents the frequency of these collaborations. Areas with numerous connecting lines indicate strong collaborative relationships among the authors. There are two major groups of frequently collaborating authors, such as "Wang Y" and "Zhang Y" in the blue cluster, as well as "Zhang H" and "Chen W" in the red cluster. There are also several smaller groups indicating more specific collaborations among authors, such as those in the green, purple, orange, brown, and pink clusters. Overall, this figure provides a comprehensive view of the collaboration patterns among authors in a particular set of scholarly publications. The clusters indicate that while some groups of authors frequently work together, others tend to collaborate within smaller or more specific groups.

### Multivariate Linear Regression

#### Demographics

The demographic characteristics of respondents are presented in Table 8. The average age of the sample is 22 years, with an age range spanning from 5 to 44 years. The age range in the sample is divided into eight segments, each covering a 5-year interval. Gender categories are divided into two groups, male and female, based on age range. The place category is also split into two groups: urban and rural areas. The number of individuals experiencing mental disorders and learning disorders is classified based on age range, gender, and area of residence.

Table 8. Demographics

Variable	Characteristics	Mental Disorder	Percentage (%)	Learning Disorder	Percentage (%)
Age Range	5-9	7476	9,68	31286	11,22
	10-14	8134	10,53	34298	12,31
	15-19	7938	10,28	36040	12,93
	20-24	9382	12,15	38390	13,77
	25-29	12552	16,26	40090	14,38





Variable	Characteristics	Mental Disorder	Percentage (%)	Learning Disorder	Percentage (%)
Gender	30-34	11702	15,16	36914	13,24
	35-39	10208	13,22	32088	11,51
	40-44	9821	12,72	29624	10,63
	Male	49630	64,28	157870	56,64
	Female	27583	35,72	120860	43,36
Place	Urban Area	41680	53,98	174700	62,68
	Rural Area	35534	46,02	104031	37,32

The highest prevalence of mental disorders is observed in the age range of 25-29 years (16.26%), while the lowest is in the age range of 5-9 years (9.68%). It indicates that mental disorders tend to become more common with increasing age, peaking in the late twenties before slightly decreasing in later age ranges. Conversely, learning disorders are most prevalent in the 25-29 year age range (14.38%) and least prevalent in the 40-44 year age range (10.63%). There is an increase in the prevalence of learning disorders from childhood to young adulthood, followed by a decline in later age ranges.

The percentage of mental disorders is higher in males (64.28%) compared to females (35.72%). This significant gender difference indicates that males are nearly twice as likely to experience mental disorders as females. Additionally, more males (56.64%) experience learning disorders compared to females (43.36%). Although the gender difference is not as pronounced as it is for mental disorders, males still have a higher prevalence of learning disorders.

Individuals living in urban areas (53.98%) have a higher prevalence of mental disorders compared to those living in rural areas (46.02%). It may suggest that urban environments contribute to higher stress levels and mental health issues. The prevalence of learning disorders is significantly higher in urban areas (62.68%) compared to rural areas (37.32%). It may be due to better diagnosis and reporting in urban areas or higher academic pressures leading to more identification of learning disorders.

#### Correlation Results

The correlations between different variables, namely age range, gender, place of residence, mental disorders, and learning disorders, are assessed using Pearson correlation. The correlation values range between -1 and 1, where a value of (1) indicates a perfect positive correlation, a value of (-1) indicates a perfect negative correlation, and a value of (0) indicates no correlation. The correlation results are presented in Table 9.

Table 9. Correlations between different variables

		Age Range	Gender	Place	Mental Disorder	Learning Disability
Age Range	Pearson Correlation	1	.000	.000	.311	-.046
	Sig. (2-tailed)		1.000	1.000	.084	.803
Gender	Pearson Correlation	.000	1	1.000	-.760	-.423*
	Sig. (2-tailed)	1.000		.000	.000	.016
Place	Pearson Correlation	.000	1.000	1	-.760	-.423*
	Sig. (2-tailed)	1.000	.000		.000	.016
Mental Disorder	Pearson Correlation	.311	-.760	-.760	1	.627
	Sig. (2-tailed)	.084	.000	.000		.000
Learning Disability	Pearson Correlation	-.046	-.423*	-.423*	.627	1
	Sig. (2-tailed)	.803	.016	.016	.000	

. Correlation is significant at the 0.01 level (2-tailed).

\*. Correlation is significant at the 0.05 level (2-tailed).



The correlation between age range and gender, as well as between age range and place of residence, is 0, indicating no relationship between age range and either gender or place of residence. The correlation with mental disorders is 0.311 ( $p = 0.084$ ), reflecting a moderate positive correlation that is not statistically significant at the 0.05 significance level. The correlation with learning disorders is -0.046 ( $p = 0.803$ ), indicating a very weak negative relationship that is not statistically significant.

The correlation between gender and place of residence is 1, suggesting a perfect correlation between these variables. However, this result may be a data error, as it is illogical for gender and place of residence to have a perfect correlation. The correlation with mental disorders is -0.760 ( $p < 0.01$ ), demonstrating a strong negative correlation that is statistically significant at the 0.01 significance level. It implies that higher gender values (e.g., male) are associated with a lower likelihood of mental disorders. The correlation with learning disorders is -0.423 ( $p < 0.05$ ), showing a moderate negative correlation that is statistically significant at the 0.05 significance level. This indicates that males are less likely to experience learning disorders than females.

The correlation between place of residence and mental disorders is -0.760 ( $p < 0.01$ ), revealing a strong negative correlation that is statistically significant. It suggests that residing in urban areas is associated with a lower likelihood of mental disorders. The correlation with learning disorders is -0.423 ( $p < 0.05$ ), indicating a moderate negative correlation that is statistically significant. It implies that living in urban areas is associated with a lower likelihood of learning disorders.

The correlation between mental disorders and learning disorders is 0.627 ( $p < 0.01$ ), showing a strong positive correlation that is statistically significant. This indicates that individuals with mental disorders are also likely to have learning disorders. This interpretation underscores the importance of considering demographic factors in understanding the prevalence of mental and learning disorders and highlights the need for targeted interventions based on gender and place of residence.

#### *Multiple Linear Regression*

This study has learning disorders as the dependent variable and three independent variables: age range, place of residence, and mental disorders. The analysis of the effects is conducted using multiple linear regression. The results of the multiple linear regression are presented in Tables 10 and 11.

Table 10. Multiple Linear Regression

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	797.153	3103.136		.257	.799
	Age Range	-418.276	182.262	-.351	-2.295	.029
	Place	1767.042	1222.318	.323	1.446	.159
	Mental Disorder	2.961	.710	.982	4.173	.000

a. Dependent Variable: Learning Disability

Table 11. Excluded Variables

Model	Beta In	T	Sig.	Partial Correlation	Collinearity Statistics
					Tolerance
1	Gender	. <sup>b</sup>	.	.	.000

a. Dependent Variable: Learning Disability

b. Predictors in the Model: (Constant), Mental Disorder, Age Range, Place

The variable age range exhibits a negative B coefficient, indicating a negative relationship between age range and learning disorders. For each one-unit increase in age range, learning disorders are predicted to decrease by 418.276 units. The p-value (0.029) is less than 0.05, suggesting that this relationship is statistically significant. The Beta coefficient of -0.351 implies that age range has a moderate negative impact on learning disorders.





The variable place of residence shows a positive B coefficient, suggesting a positive relationship between place of residence and learning disorders. However, the p-value (0.159) is greater than 0.05, indicating that this relationship is not statistically significant. The Beta coefficient of 0.323 indicates that place of residence has a moderate positive impact on learning disorders, but this effect is not significant.

The variable mental disorders presents a positive B coefficient, signifying a positive relationship between mental disorders and learning disorders. For each one-unit increase in mental disorders, learning disorders are predicted to increase by 2.961 units. The p-value (0.000) is less than 0.01, indicating that this relationship is highly statistically significant. The Beta coefficient of 0.982 demonstrates that mental disorders have a very strong positive impact on learning disorders.

The variable gender is excluded from the regression model. The tolerance value of 0.000 suggests that the variable "Gender" may be highly correlated with other variables in the model. It leads to its exclusion due to the potential for high collinearity, which can undermine the accuracy of the model's estimates. The variable "Gender" may provide information that is already explained by other variables in the model, such as "Mental Disorder," "Age Range," or "Place." In this case, including "Gender" does not offer additional meaningful information for the model.

## Discussion

The increasing trend in publications and citations highlights that student mental health has become a primary focus within the scientific community. The surge in articles during the COVID-19 pandemic reflects the substantial impact of the global situation on individuals' mental health, particularly students. International collaboration and contributions from various authors and countries underscore the importance of global cooperation in understanding and addressing this issue. Highly cited articles indicate the relevance and impact of the research, providing a foundation for developing more effective policies and interventions.

The decline in publications in 2023 suggests a need for sustained efforts to maintain interest and investment in this research area. Consistent support from governments, educational institutions, and the scientific community is essential to ensure that student mental health remains a priority. Research should increasingly focus on effective interventions and their implementation within educational environments. Additionally, a more holistic approach involving various disciplines is necessary to understand and address this issue comprehensively. Continued international collaboration is vital for sharing knowledge and best practices in managing student mental health. Research findings indicate that mental and learning disorders are most prevalent among young adults, particularly those aged 25-29. It is due to various factors, including academic pressure, the transition to adulthood, and increasing responsibilities. It is crucial to provide appropriate support and interventions for this age group to mitigate the risk of mental and learning disorders.

Men have a higher prevalence of mental and learning disorders compared to women. Men may be more prone to facing social pressure to suppress their emotions, contributing to mental health issues. Additionally, living in urban areas is associated with a higher prevalence of mental and learning disorders. Urban environments are often more stressful due to population density, pollution, and higher life pressures. Access to mental health services may be better in urban areas, leading to more diagnoses and reporting of mental and learning disorders.

Correlation analysis shows a strong positive relationship between mental and learning disorders, indicating that individuals with mental disorders are likely also to have learning disorders. It underscores the importance of a holistic approach in addressing mental health and learning issues. Regression results demonstrate that mental disorders have a significant and strong impact on learning disorders, highlighting the need for comprehensive interventions for both issues.

## Knowledge Contribution



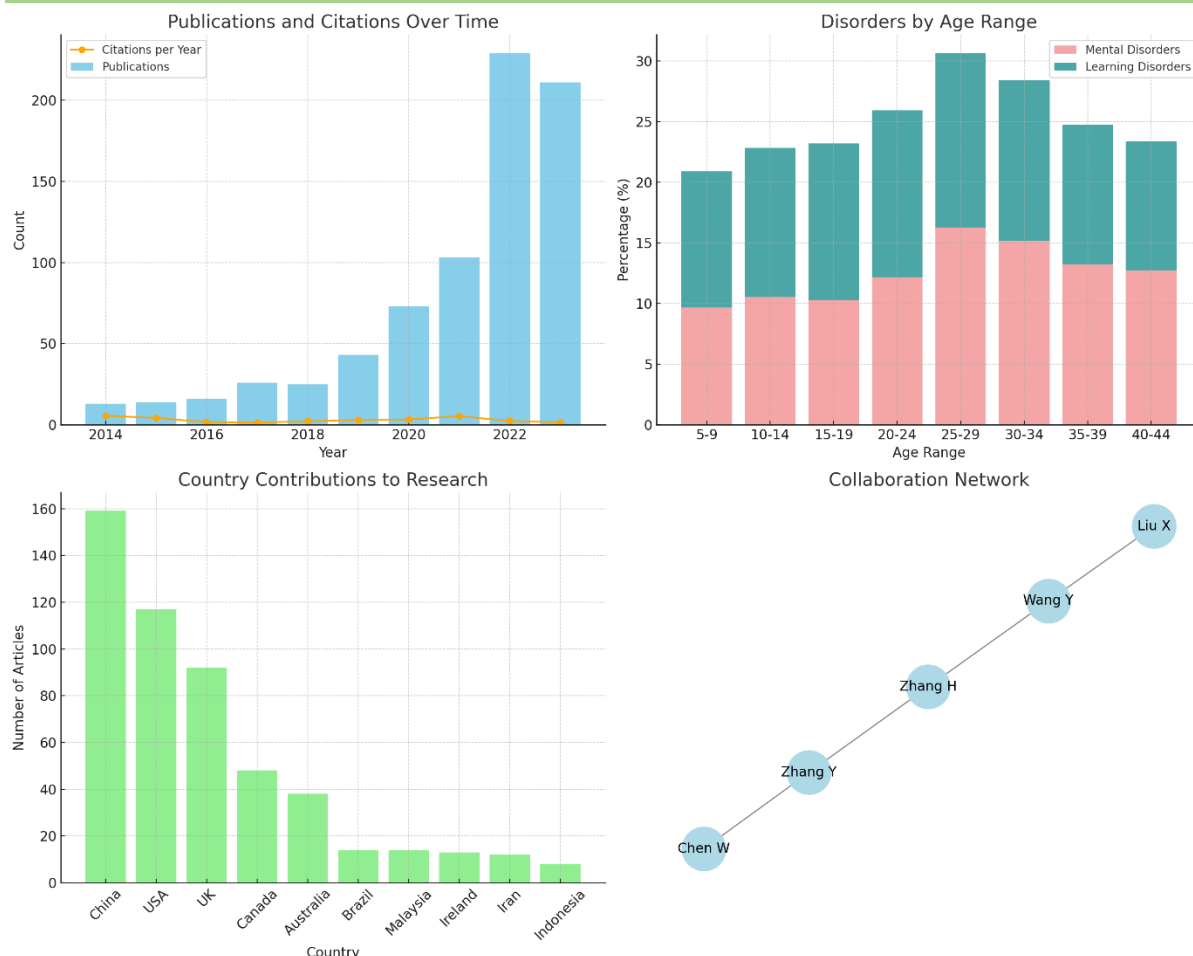


Figure 8 Research Trends in Mental Health and the Effect on Students' Learning Disorder

### 1. Publications and Citations Over Time (Top Left)

This section visualizes the trends in annual scientific production and the average citations per year from 2014 to 2023:

1.1 The blue bars represent the **number of published articles**. There is a steady increase in research output, peaking in 2022 with 229 publications. However, there was a slight decline in 2023 to 211 articles.

1.2 The orange line represents the **citations per year**. Older articles (e.g., 2014–2015) had more time to accumulate citations, so their rates are relatively high. In contrast, recent articles (e.g., 2022–2023) are still accumulating citations.

This part shows the rising interest in mental health research and the time-dependent nature of citation impact.

### 2. Disorders by Age Range (Top Right)

This stacked bar chart shows the prevalence of mental and learning disorders across different age ranges:

**2.1 Mental Disorders (light red):** The prevalence is highest among individuals aged 25–29 (16.26%) and lowest in children aged 5–9 (9.68%).

**2.2 Learning Disorders (teal):** These are also most common in the 25–29 age range (14.38%) and decrease steadily in older age groups.

This visualization highlights how both mental and learning disorders are more common in young adults and less prevalent in older or younger populations.

### 3. Country Contributions to Research (Bottom Left)

This bar chart depicts the number of research articles contributed by the top countries:



**3.1 China** leads with the highest number of publications (159), followed by the **USA** (117) and the **United Kingdom** (92).

3.2 Other countries like Canada, Australia, and Brazil contribute fewer articles but remain significant contributors.

This chart reflects the global distribution of mental health research, with China and the USA dominating the field, likely due to substantial research funding and infrastructure.

#### **4. Collaboration Network (Bottom Right)**

This network diagram illustrates relationships between key authors in the field:

4.1 Each **node** represents an author, and the **edges** (lines) represent collaborative efforts on research publications.

4.2 Prominent authors like **Wang Y** and **Zhang H** are central in the network, indicating significant contributions and frequent collaborations.

This graph underscores the collaborative nature of mental health research, with some authors forming tightly connected clusters, enabling impactful multidisciplinary studies.

### **Recommendation**

There is a discernible trend of increased publication and citation rates concerning student mental health, indicating a primary focus of the scientific community on this issue. The substantial rise in the number of articles during the COVID-19 pandemic reflects the profound impact of the global situation on individual mental health, particularly among students. Mental and learning disorders are most prevalent in young adults, especially within the 25-29 age range. Various factors contribute to this, including academic pressure, transitions to adulthood, and increasing responsibilities. The prevalence of mental and learning disorders is higher among males compared to females. Additionally, residing in urban areas is associated with a higher prevalence of these disorders. Mental and learning disorders exhibit a strong positive correlation, suggesting that individuals with mental disorders are also likely to experience learning disorders. Regression results indicate that mental disorders have a significant impact on learning disorders, underscoring the need for comprehensive interventions to address both issues effectively.

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