

A Bibliometric Study on Ethics in Stress Data Collection for Children Utilizing Speech or Video Recordings: A Focus on Islamic Perspective and Maqasid Al-Shariah

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ABSTRACT

The main objective of this study is to determine relevant publications on general ethical guidelines for collecting data involving children. The study identified ethical guidelines for collecting stress data from children through speech or video recordings and explored their alignment with the principles of Maqasid Al-Shariah. The analysis utilised documents retrieved from the Web of Science (WoS) digital database, and the analysis of the results using Bibliometrix and Biblioshiny and Harzing's Publish or Perish softwares. From the study, we found a total of 53 relevant publications are retrieved from the WoS digital database. Five key principles emerged for ethically collecting stress data from children through speech or video recordings: anonymization and confidentiality, secure data storage, transparency, voluntary participation, and institutional oversight. These principles align with the Maqasid Al-Shariah (i) Hifz al-Nafs: secure data storage and transparency, (ii) Hifz al-'Aql: transparency and institutional oversight, (iii) Hifz al-Karāmah: anonymization and confidentiality, voluntary participation, (iv) Al-'Adalah/'Adl: transparency and institutional oversight. This research is only focusing on non-clinical research studies and children. This is the first bibliometric analysis investigating the ethics of collecting stress data from children through speech or video recordings, with a specific focus on Islamic perspectives and the principles of Maqasid Al-Shariah.

Keywords: Emotional stress detection, informed consent, Islamic ethics, paediatric, research ethics, speech and video recordings

1. INTRODUCTION

The rapid advancement of technology has made it possible to collect stress-related data through speech and video recordings, with artificial intelligence (AI) processing this data into meaningful insights, such as preliminary stress assessments. This approach allows psychological evaluations to be conducted more efficiently, potentially reducing the need for psychologist intervention during initial assessments. Moreover, the results can assist psychologists and medical professionals in identifying appropriate remedies for children more effectively.

However, this approach presents significant ethical challenges, including concerns about privacy, consent, and the potential misuse of data, particularly when involving children. Unlike adults and senior citizens, children are often overlooked in research due to their vulnerability, limited competence, and the additional ethical complexities involved in obtaining consent for data collection [1]. Despite the many challenges involved in data collection, children should not be

excluded since they are also human beings and have the potential to experience stress-related issues such as anxiety, depression, post-traumatic stress disorder (PTSD), and others.

To the best of our knowledge, after reviewing the available scholarly publications, existing research predominantly focuses on general ethics, with minimal to no exploration of Islamic ethical guidelines or Maqasid Al-Shariah. This gap is particularly evident in prestigious digital databases such as Web of Science (WoS) and Scopus. This scarcity highlights a significant gap in the literature, especially within the context of research involving children. Emphasizing Islamic ethics is vital, as these principles provide a comprehensive framework for understanding moral obligations and responsibilities across various aspects of life. Incorporating Islamic ethical values into research practices helps address the unique challenges of collecting data involving children, ensuring their rights and well-being are safeguarded. This approach not only enriches ethical discourse but also strengthens the integrity and cultural relevance of research, particularly in diverse contexts.

To address these challenges, this study conducts a bibliometric analysis to explore the ethical considerations of collecting stress data from children through speech or video recordings, with a particular focus on Islamic perspectives. The analysis focuses on published articles indexed in the Web of Science (WoS) digital database. The objectives of this study are as follows:

- To determine relevant publications on general ethical guidelines for collecting data involving children
- To identify ethical guidelines for collecting stress data from children through speech or video recordings and explore their alignment with the principles of Maqasid Al- Shariah.

The organization of this report is described as follows: Section 1 discusses the significance of stress data collection for children, underlines significant ethical concerns, and emphasizes the need for Islamic ethical perspectives based on Maqasid Al-Shariah. Section 2 presents a literature review discussing the advancements in using AI for stress data collection, as explored in several studies, to support and enhance the accuracy of results, ethical considerations in stress data collection, the Maqasid Al-Shariah context, and gaps in existing research. Section 3 discusses the bibliometric methodology, which includes the database, search strings, tools, and limits. Section 4 presents the results, analyzing trends, key metrics, and the gaps using visualizations. Finally, section 5 provides the conclusion of this bibliometric analysis review

2. LITERATURE REVIEW

Understanding the ethical implications of collecting stress data from children is crucial, especially as advancements in technology, such as speech or video recording, continue to shape the field. While numerous studies have addressed general ethical concerns of data collection, there remains a significant gap in exploring how Islamic ethical principles, particularly those rooted in Maqasid Al- Shariah, can inform and guide these practices.

Stress data collection, particularly for children, plays a crucial role in diagnosing early stress-related issues, allowing psychologists to intervene and prevent the development of untreated mental health problems. The use of advanced technologies, such as AI, enhances this process by analysing speech or video recordings to detect early signs of stress in children. Several studies have shown that speech or video analysis can offer more accurate recognition of mental health issues like stress and depression, improving diagnostic precision and treatment outcomes [2], [3], [4], [5].

Another study explored a new approach to detecting human stress by analysing audio-visual data, specifically using a cascaded RNN-LSTM (Recurrent Neural Network - Long Short-Term Memory) strategy. The research achieved 91% accuracy in classifying emotional states and stress levels on the RAVDESS dataset [2]. This method offers a more accurate alternative to traditional self-report questionnaires and interviews, which are often time-consuming and less reliable. The paper highlights the significance of stress as a widespread issue and its impact on health, advocating for innovative techniques in stress detection to improve mental well-being [2].

Another study used machine learning to analyse speech patterns in children to detect anxiety and depression, conditions often overlooked in early childhood [4]. By analysing a 3 -minute speech task, the study achieved 80% accuracy in identifying children with internalizing disorders. Key speech features like low-pitched voices and specific speech inflections were found in affected children. This approach outperformed traditional clinical methods, showing promise for early detection and intervention, which could lead to better long-term outcomes. The study suggests a new tool for screening young children for internalizing disorders efficiently [4].

Several ethical concerns arise regarding the privacy of children in research involving speech and video recordings, particularly issues related to privacy, data misuse, and consent [6]. The authors highlight a case in which a breach of confidentiality occurred for commercial purposes, with data being used without proper anonymization [6]. To address these concerns, general ethical guidelines have been established for involving children in research. Moreover, as science and technology advance, it is crucial to continuously update legal and ethical safeguards to ensure children's rights are always protected.

According to the Office of the Mufti of the Federal Territory, Malaysia, Maqasid Al-Shariah refers to the essential ideas and aims that constitute the foundation of Islamic law, highlighting the promotion of justice, welfare, and the greater good of society [7]. Based on al-Shatibi (a well-known Islamic scholar), he divided the general objectives (maslahah) into three sub-categories as follows [8]:

- Daruriyyah (Necessities) refers to five purposes of Shariah: Hifz al-Din (Preservation of Faith), Hifz al-Nafs (Preservation of Life), Hifz al-'Aql (Preservation of Intellect), Hifz al-Nasl (Preservation of Lineage) and Hifz al-Mal (Preservation of Wealth).
- Hajiyyah (Complementary) refers to the supplement of the five purposes of Shariah that alleviate hardship which can cause our life distress and predicament.
- Tahsiniyyah (Embellishments) refers to the perfection of preserving the dignity of human life, which includes noble values and excellent customs, as well as avoiding negative situations based on sound reasoning.

Modern scholars have introduced new concepts and classifications of Maqasid Al-Shariah by considering additional dimensions relevant to contemporary contexts [9]. Among the expanded Maqasid, the following are particularly significant to this study [9]:

- Hifz al-Karāmah (Preservation of Human Dignity): Renowned contemporary Islamic scholar Yusuf al-Qaradawi identified human dignity and rights as universal objectives (Maqasid) of Shariah. This concept addresses modern concerns such as equality, justice, and fair treatment for all individuals, aligning with the Qur'anic principle of honouring the inherent dignity of humanity.
- Al-'Adālah/'Adl (Justice): Mohammad al-Ghazali emphasized the importance of justice and freedom, categorizing them as necessities (daruriyyah) within the framework of Maqasid Al- Shariah.

From the perspective of Maqasid Al-Shariah, getting informed consent from children, especially in studies that may affect their mental or physical state, can be viewed as achieving various aims, which largely fall under *Hifz al-Nafs* (Preservation of Life), *Hifz al-'Aql* (Preservation of Intellect), and *Hifz al-'Ird* (Preservation of Dignity and Rights). This approach is consistent with one of the fundamental ethical principles in research involving minors: the need to seek informed consent to safeguard their well-being and uphold their dignity [1].

Existing literature highlights a significant gap in the representation of Islamic ethical guidelines, particularly Maqasid Al-Shariah, within research on data collection ethics involving children [10]. Additionally, to the best of our knowledge, a review of digital databases, particularly Web of Science (WoS), reveals a significant gap in studies exploring the integration of Islamic ethics with AI and machine learning applications in stress data collection. This highlights the need for more research and the development of guidelines leading to frameworks that combine Islamic principles with modern technologies. This research is important because general ethical guidelines, while valuable, may not fully address the specific cultural, religious, and moral considerations of diverse communities. Referring to Maqasid Al-Shariah brings unique insights and complements general ethical principles, especially in contexts where Islamic values significantly influence societal norms and expectations.

3. METHODOLOGY

This section describes the bibliographic database where the database is used and the search strategy, including topic, scope and eligibility, screening and inclusion criteria which addressed the first objective of this study.

3.1 Bibliographic Database

This bibliometric analysis exclusively utilised documents retrieved from the Web of Science (WoS) digital database. Non-peer-reviewed materials, often categorised as grey literature, were excluded to maintain a focus on peer-reviewed studies. This decision was made to ensure the inclusion of high-quality research, accurately capture the current trends within the research field, and improve the visibility and relevance of the findings.

3.2 Search Strategy

The most important step in creating the bibliometric analysis was identifying the right search string [11]. Based on the study's topic, several search strings were developed in this study, ultimately narrowing it down to one final version that captured all the essential keywords to ensure every relevant paper was included. The research string was designed around three key components: (i) children, (ii) data collection, and (iii) ethics in research, with synonyms for each of these also incorporated. Initially, "Islamic jurisprudence" was included as a separate component in the search string, but it returned zero results. Therefore, it was added as part of the "ethics in research" component instead.

To minimise false positive results, the "Topic" search setting was used, as relying on "All Fields" tends to generate many irrelevant results. Next, the following exclusion criteria were applied: (i) excluding papers related to "clinical," "medical," or "biomedical" fields, (ii) limiting the research to English-language papers only, and (iii) excluding papers that were not accessible. The first criterion was set because this study focuses specifically on stress data collection through speech or video recordings and does not involve clinical contexts. The second criterion stems from the authors' proficiency in English; since they are not fluent in Arabic, only research and discussions in English were considered. Finally, any papers that could not be accessed were

excluded, as their relevance and suitability could not be assessed. As a result, only accessible literature was included in the analysis.

In this study, the extracted documents primarily focus on general ethics in data collection involving children. However, they do not specifically address stress data collection using speech or video recordings from an Islamic perspective or within the framework of Maqasid Al-Shariah. To the best of our knowledge, no papers on this specific topic have been published, particularly in the Web of Science (WoS) digital database.

This bibliometric analysis leverages the powerful software tools Bibliometrix and Biblioshiny [12] and Harzing’s Publish or Perish [13], enabling us to conduct in-depth analyses of extensive scientific databases efficiently. While this study focuses on a single database, this choice is driven by its capability to facilitate data analysis and visualisation, offering valuable insights into research trends and their broader impacts. By employing these tools, the study systematically evaluates the performance and contributions of scholars, publications, and institutions, providing a robust understanding of the subject matter.

4. RESULTS AND DISCUSSION

This section presents the results in a visual format generated using the Bibliometrix and Biblioshiny tools. These visualizations include the annual scientific production, the publication sources and Bradford’s Law, the author’s performance metrics, an overview of the documents’ metrics, and lastly, the collaboration network. Additionally, the summary of the primary information from the analysed documents is extracted using both Harzing’s Publish or Perish and the Bibliometrix and Biblioshiny tools. As stated in the introduction section, the results provided in this section have little to no attention given to Islamic ethical perspectives or the context of Maqasid Al-Shariah. A summary of these extracted documents is provided in Table 1.

Table 1 Summary of the primary information from the analysed documents

Descriptions	Results
Main Information About Documents	
Publication years	2000-2024
Documents	53
Annual growth rate %	6.94
Citations	713
Cites per year	28.52
Cites per paper	13.45
Reference	2225
h-index	14
g-index	25
Authors	
Authors	217
Authors of single-authored doc	8
Authors Collaboration	
Single-authored doc	9
Co-authors per doc	4.17
International co-authorships (%)	24.53

The description of the primary information from the analysed documents is as follows:

- **Main Information About Documents**
 - **Publication years:** The document analysed spans from the year 2000 to the year 2024.
 - **Documents:** The extracted document comprised 53 journal articles
 - **Annual growth rate (%):** The publications have grown at a rate of 6.94% per annum.
 - **Citations:** A total of 713 citations, representing the number of times all publications have been referenced in other studies.
 - **Citations per year:** An average of 28.52 citations per year has been recorded.
 - **Citations per paper:** Each document averages 13.45 citations, reflecting a moderate to high level of impact per paper.
 - **References:** The documents include 2,225 references, showing how strongly they build on and connect to existing research.
 - **h-index:** The h-index of 14 indicates that 14 papers have received at least 14 citations which highlights a good combination of impact and productivity for the authors.
 - **g-index:** With a g-index of 25, it reflects the influence from the researcher's most impactful papers.
- **Authors**
 - **Authors:** The publications involve 217 number of authors.
 - **Authors of single-authored doc:** Only 8 documents are single-authored, accounting for approximately 3.69% of the total, highlighting the dominance of collaborative efforts.
- **Authors Collaboration**
 - **Single-authored document:** 9 out of 53 documents were written by a single author, emphasizing the collaborative nature of the research study.
 - **Co-authors per document:** On average, there are 4.17 co-authors per paper, indicating a good trend toward teamwork in research.
 - **International co-authorships:** Nearly a quarter (24.53%) of the documents involve international collaborations, emphasising the global nature of the research community.

This analysis reveals a growing research output with a citation impact. The collaboration between researchers, both nationally and internationally, emphasizes an interconnected research environment. The documents reflect both the influence of individual publications and the collective contribution to advancing knowledge in the field.

4.1 Annual Scientific Production

The annual scientific production of extracted documents from the year 2000 to 2024. Overall, the total number of articles published across the 25 years shows a steady increase in research outcomes, especially in the later years, which started from the year 2017 onwards. In the early years, which started from 2000 until 2006, there were very few publications observed, with several years recording zero publications. Following that, there is a slight increase in publications starting in the year 2007 with some fluctuations in the overall publications but with an increasing trend.

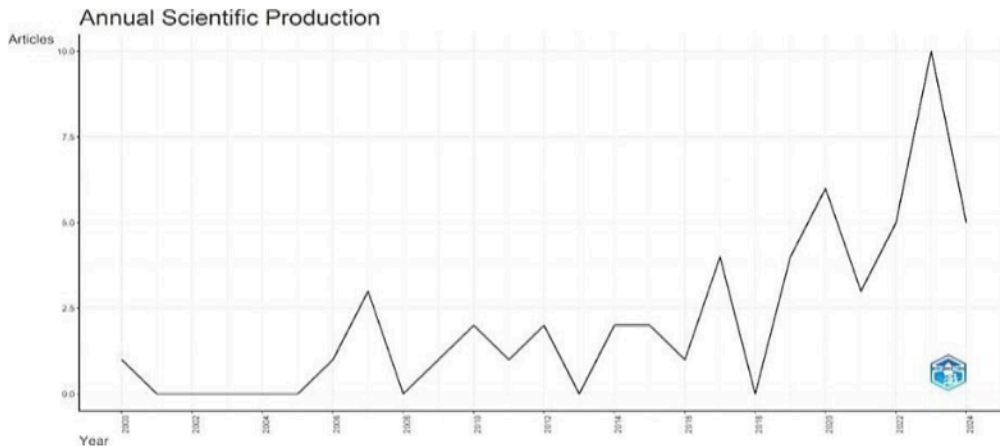


Figure 1. Visual Representation of Annual scientific production across the years 2000 to 2024.

Meanwhile, starting from the year 2017 until 2023, there is a noticeable growth with the number of publications increasing significantly in 2023. This suggests an increasing interest in the research field during these years. However, this trend did not continue in the year 2024 when the number of publications continued to drop to half. This might be due to the range of year selection that stops in 2024 in our study. Figure 1 and Table 2 provide the annual scientific production in visual and table forms, respectively. These results make it evident that interest in this area is rising, and more researchers should be encouraged to investigate and contribute to it.

Table 2 Tabular Representation of Annual scientific production across the years 2000 to 2024

Year	Total Publications	Year	Total Publications	Year	Total Publications
2000	1	2009	1	2018	0
2001	0	2010	2	2019	4
2002	0	2011	1	2020	6
2003	0	2012	2	2021	3
2004	0	2013	0	2022	5
2005	0	2014	2	2023	10
2006	1	2015	2	2024	5
2007	3	2016	1		
2008	0	2017	4		
				Total	53

4.2 Publication Sources

The most relevant publication sources in this research field are listed in Table 3, which highlights the top 10 sources. According to the data, PLOS ONE has published the highest number of studies in this area, followed by Behavior Research Methods, BMC Medical Ethics, BMC Public Health, and others. This information provides valuable insights for researchers, helping them identify key publishers that focus on this field and guiding them in selecting suitable platforms for their work.

Table 3 Top 10 Most Relevant Publication Sources

Sources	No of Articles
PLOS ONE	3
Behavior Research Methods	2
BMC Medical Ethics	2
BMC Public Health	2
Childhood-A Global Journal of Child Research	2
International Journal of Inclusive Education	2
Journal Of Pediatric Nursing-Nursing Care of Children & Families	2
Annals Of King Edward Medical University Lahore Pakistan	1
BMC Family Practice	1
BMC International Health and Human Rights	1

4.3 Author's Performance Metrics

The author's impact on the publications can be divided into several categories: the most relevant authors, the most locally cited authors, the author's productivity via Lotka's Law, the most relevant affiliations and lastly, countries.

4.3.1 The Most Relevant Authors

Table 4 lists the top 10 most relevant authors.

Table 4 Top 10 Most Relevant Authors

Authors	No. of Articles	Articles Fractionalised
Ashworth E	2	0.25
Howitt C	2	0.83
Mayne F	2	0.83
Mckechnie L	2	2.00
Abel Hs	1	0.13
Abraham O	1	0.25
Alamrani S	1	0.17
Allen E	1	0.13
Anchang GNJ	1	0.09
Anderson YC	1	0.25

The first category, "the most relevant authors," refers to researchers who have made significant contributions to the field, as determined by their number of publications, the impact of their work, and their overall prominence in the literature. Based on the extracted documents, the most relevant authors include Ashworth E., Howitt C., Mayne F., and McKechnie L., all of whom have published at least two articles in this research area. The fractional counting method was used to account for each author's contribution, dividing their input proportionally among the co-authors of a publication. For instance, although Ashworth E published two articles, it has a lower fractionalised score of 0.25. This indicates that the author is probably a minor co-author in both articles and worked on papers with many co-authors.

4.3.2 Author's Productivity through Lotka's Law

The third category, "author productivity through Lotka's Law," examines the distribution of authorship productivity within the field. According to this principle, a small proportion of authors account for the majority of publications, while the majority contribute far less. As illustrated in Figure 2 and Table 5, which present the findings derived from the analysed documents, 98.2% of the authors have contributed only a single publication, whereas a small minority (1.8%) have authored two publications. This pattern aligns with Lotka's Law, reflecting a typical distribution where a few authors are significantly more prolific, while most contribute only once.

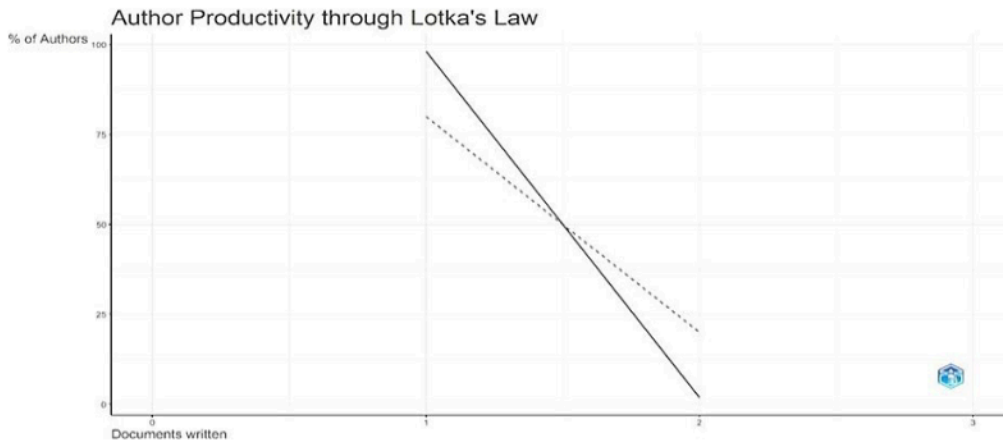


Figure 2. Visual Representation of Author Productivity through Lotka's Law.

Table 5 Tabular Representation of Author Productivity through Lotka's Law

Documents written	No. of Authors	Proportion of Authors
1	213	0.982
2	4	0.018

4.3.3 The Most Relevant Affiliations

The fourth category, "the most relevant affiliation" reveals that the University of London leads in research output with 10 documents, followed by the University of Toronto with 9 and other institutions, as detailed in Table 6 (top 10 most relevant affiliations).

Table 6 Top 10 Most Relevant Affiliations

Authors	No. of Documents
University Of London	10
University Of Toronto	9
Johns Hopkins University	5
London School Of Hygiene and Tropical Medicine	5
Universidade Federal De Santa Catarina (UFSC)	4
University College London	4
University Of Western Australia	4
Johns Hopkins Medicine	3
Karolinska Intitutet	3
Liverpool John Moores University	3

4.3.4 Countries

The final category, “countries” shows that the United Kingdom leads in research output, contributing 14 documents, or 26.4% of the total publications as visually presented in Figure 3. It is followed by Canada, with 7 documents (13.2%), and other countries, also shown in Figure 3 and detailed in Table 7. Not only that, but the United Kingdom has also received the most cited countries, with a total citation of 314, followed by Canada with 118 and others as shown in Table 7 (the top 10 most cited countries). These findings emphasize the United Kingdom’s leading role in this field compared to other countries.

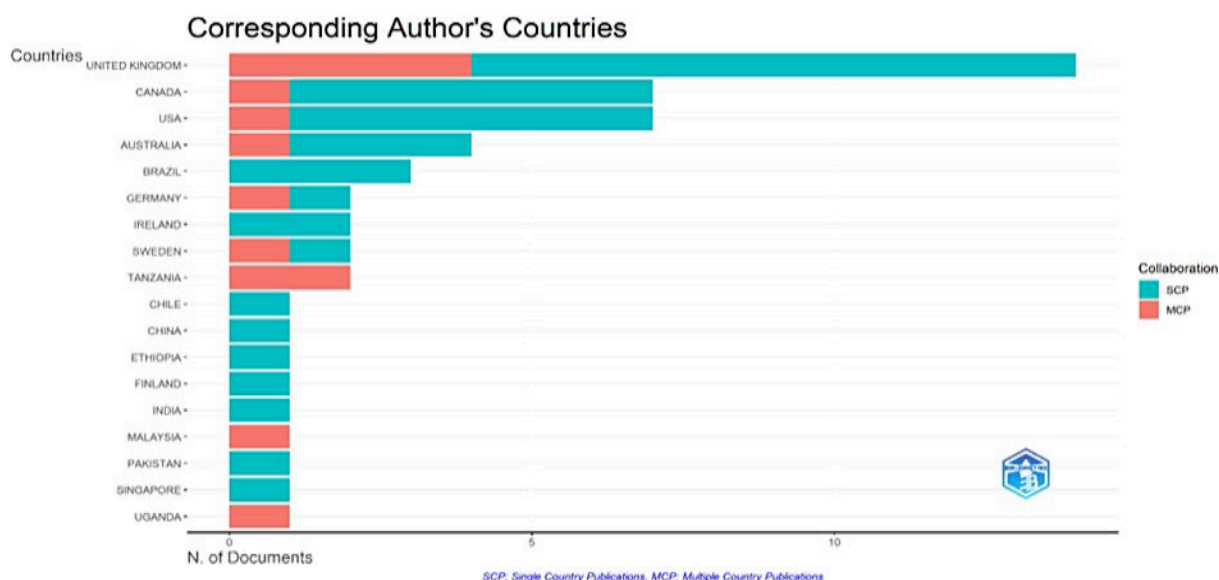


Figure 3. Visual Representation of Corresponding Author’s Countries.

Table 7 Top 10 Most Cited Countries

Country	Total Citations	Average Document Citations
United Kingdom	314	22.40
Canada	118	16.90
USA	116	16.60
Ireland	41	20.50
Brazil	24	8.00
Australia	21	5.20
Sweden	17	8.50
Finland	14	14.00
Tanzania	12	6.00
Germany	11	5.50

4.4 Islamic Ethics Integration

Referring to the views from the three perspectives (international ethical principle, local ethical principle, predominant local religion ethical perspective), the following best practices can be implemented to produce the ethical framework for collecting stress data from children through speech or video recording as follows [14], [15], [16]:

- **Anonymisation and confidentiality:** The implementation of anonymisation in data collection helps to ensure every participant's confidentiality; thus, anyone can never identify the participants' identities by listening to or viewing the collected data.
- **Secure data storage:** The implementation of storing the data collected in a secure environment helps to restrict access to authorised personnel only.
- **Transparency:** The implementation of transparency during the data collection by clearly conveying each element of the research study, including objective, procedure, potential risks, and others, gives benefits, especially to the participants (parents and children).
- **Voluntary participation:** The implementation of voluntary participation ensures no coercion, and they can withdraw their participation at any time without issues.
- **Institutional Oversight:** Getting a review from the ethics committee helps to ensure the research adheres to the ethical standards before conducting the research study.

Based on the ethical guidelines above, we identified that they can be aligned with the principles of Maqasid Al-Shariah is as follows [17]:

- **Hifz al-Nafs (Preservation of Life):** This principle aligns with the following:
 - Secure data storage: Ensuring the data storage is secure and encrypted reduces and diminishes the potential of misuse by unauthorised persons and protects the children's security.
 - Transparency: Ensuring the data collection does not impose excessive stress on children.
- **Hifz al-'Aql (Preservation of Intellect):** This principle aligns with the following:
 - Transparency: Getting participants' consent to the study before the data collection respects the intellectual agency of participants and supports conscious, reasoned decision-making.
 - Institutional Oversight: Getting an ethical review by an ethical committee ensures the research designs are beneficial, sound and avoid any methods that possibly harm the participants' cognitive development.
- **Hifz al-Karāmah (Preservation of Human Dignity):** This principle aligns with the following:
 - Anonymisation and confidentiality: Ensuring the anonymity of participants helps to safeguard the participants' personal information and prevent any social repercussions. It upholds the dignity of the participants, respecting their privacy and upholding their honour.
 - Voluntary participation: Getting the participants' consent gives them the freedom to either participate or withdraw at any stage of data collection. By having this, it upholds their autonomy and personal dignity.
- **Al-'Adalah/'Adl (Justice):** This principle aligns with the following:
 - Transparency: Providing clear explanations of methods ensures all the participants receive the same protection. It upholds the fairness in research.
 - Institutional Oversight: Getting a review by the ethical committee ensures research transparency that helps to mitigate potential bias and exploitation, thereby reflecting equitable treatment of all participants.

5. CONCLUSION

This study represents the first bibliometric analysis focused on ethics in stress data collection from children through speech or video recordings, specifically examining it with the Islamic principles. This research is crucial, as it addresses a significant gap in incorporating Islamic perspectives into this field. The lack of representation underscores the necessity to encourage similar studies, particularly among Muslim researchers, who can contribute to expanding the

application of Islamic ethical principles in research. Besides, to address these gaps, 53 relevant publications were identified and analysed concerning general ethical frameworks for collecting data from children. Given the limited research on this specific topic, a broader exploration was conducted using strict inclusion and exclusion criteria to ensure alignment with the study's objectives. The outcomes of this research benefit society at large, including children, parents, researchers, and policymakers. By integrating Maqasid Al-Shariah, the study upholds ethical standards that honor children's dignity, well-being, and intellectual development, while safeguarding justice and fairness. Future studies could focus on developing concrete Islamic ethical frameworks for AI-driven child research, or expanding this analysis to Arabic databases or clinical contexts.

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