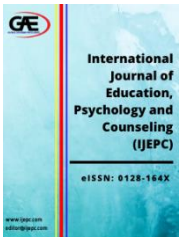
International Journal of Education, Psychology and Counseling
IJEPC
EISSN : 0128-164X
Volume 10 Issue 58 (June 2025) PP. 679-684
DOI 10.35631/IJEPC.1058045



INTERNATIONAL JOURNAL OF EDUCATION, PSYCHOLOGY AND COUNSELLING (IJEPC)
www.ijepc.com

BIG DATA APPLICATIONS IN COUNSELING SERVICES: POTENTIAL, CHALLENGES, AND IMPLICATIONS

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Article Info:

Article history:
Received date: 14.04.2025
Revised date: 30.04.2025
Accepted date: 25.05.2025
Published date: 24.06.2025

To cite this document:

Mohaiyuddin, N., Ismail, I. M., Kardi, N., & Astuti, B. (2025). Big Data Applications In Counseling Services: Potential, Challenges, And Implications. *International Journal of Education, Psychology and Counseling, 10* (58), 679-684.

DOI: 10.35631/IJEPC.1058045

Abstract:

Big data introduces a new dimension to counselling services through large-scale data analysis, thereby increasing the effectiveness of psychological interventions. Counsellors can obtain a thorough understanding of a client's profile by gathering and analysing data from a variety of sources, including social media, medical records, and surveys on mental health. The purpose of the project is to evaluate how big data in counselling services might be used to pinpoint client needs and patterns and customise interventions for their welfare. Ten academic articles and empirical reports on big data in counselling were reviewed as part of the study's methodology, which comprised searching the Scopus and Google Scholar databases. Three primary themes emerged from the implementation of a scoping review approach: potential, technological constraints, and ethical considerations. By increasing the efficacy of interventions, big data holds the potential to completely transform counselling. However, ethical compliance, technological stability, and professional training of counselors in data analytics must be prioritized. This combination opens up new directions, capable of transforming conventional clinical approaches into more intelligent, targeted, and client- centered support systems, and discusses its implications for the quality, effectiveness, and future of rapidly changing counseling services

Keywords:

Big Data, Counseling, Mental Health, Potential, Challenges

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Introduction

The term "big data" describes vast, intricate datasets that are produced quickly and are frequently obtained from a variety of sources, including social media, mental health apps, medical records, and psychological surveys (Abu Salih et al., 2021). Counsellors and providers of mental health services are starting to realise that this data can provide a profound understanding of the needs of their clients, which will ultimately lead to more thorough and focused responses (Simon, 2019). Furthermore, the existence of big data in counselling enables medical practitioners to track mental health concerns in real-time, as well as providing them with a more detailed knowledge of clients' emotional patterns and trends (Simon, 2019). As such, when a client requires urgent help, predictive analytics can be employed to keep track of particular circumstances immediately. As suggested by Depp et. al (2016), an alarm system may be utilised to inform counsellors of a client's tendency to show repetitive symptoms. One advantage of big data is that it provides a more meticulous and impartial viewpoint. This makes the method special compared to traditional counselling, which primarily focuses on in-person meetings and subjective reports (Hsu et al., 2023).

Nonetheless, there are also disadvantages in utilising big data for a counselling setting. As information regarding mental health is described as confidential and sensitive data, there are certain difficulties in using big data in the counselling setting. As stated by Grover et.al (2020), information about mental health is classified as very sensitive data; therefore, it is extremely important to uphold client confidentiality and privacy. As such, to ensure that the acquired data will not be exploited or disseminated to unscrupulous third parties, it is imperative that the staff involved adhere to strict data governance and informed consent procedures (Wibawa et al., 2022). Certain issues will also be raised about the cost, system dependability, and staff competence in using advanced analytical tools due to the excessive use of technology infrastructure (Zieglmeier & Pretschner, 2023). Hence, Chen & Chen (2022) recommend that the integration of big data in counselling services should be seriously evaluated to comprehend its possibilities and hindrances, as well as identify the most effective and moral ways to utilise this innovation. As stated by Choudhury et. al (2023), when big data is used properly, it enables the provision of more precise information to enhance counselling services, as well as assisting in national and local mental health policy planning.

Literature Review

As stated by Chen & Chen (2022), the utilisation of big data enables large-scale data processing and analysis and as such, it is important to improve the efficacy of counselling services. The current literature review focuses on the most recent advancements in big data counselling, which includes the benefits and drawbacks of using this method. The process of searching for clients' behavioural and emotional patterns is facilitated through the utilisation of big data; counselling practitioners can use this method to gather and analyse data from sources such as social media, medical records and e-counselling platforms (Asri et al., 2020). Additionally, Thakkar et. al (2024) found that advanced technology such as data fusion, decision trees, and support vector machines can be helpful in predicting client needs and improving the quality of counselling services. According to Shen and Yuan (2021), a student learning behaviour evaluation system which utilises artificial intelligence (AI) may provide more detailed e-learning recommendations suitable for a university setting. This innovation can identify students' cognitive patterns and assist in educational counselling interventions using the deep learning technique (Deep Neural Network).

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As described by Goldberg et al. (2020), natural language processing (NLP) and machine learning algorithms can be utilised in counselling to identify sources of psychosocial stress from social media data. The study points out how the analysis of digital data may be able to help practitioners to better understand a particular situation. In addition, it also shows how the analysis of digital data may enable us to gain a detailed understanding of an individual's emotions. Sandoval et al. (2020) invented a preventive model of counselling support using logistic regression analysis to anticipate the possibility of students dropping out of school. This study reveals the advantages of utilising big data for developing an early warning system for student counselling.

As seen above, there is a lot of potential in utilising big data for the counselling industry; nonetheless, there are also particular drawbacks that should be looked into as well. AlMakinah et al. (2024) point out that it is highly imperative to protect student privacy in their research of assessing students' views of mental health support services in tertiary education. The study demonstrates the usage of large language models (LLMs), such as BERT and GPT-3.5, in enhancing practitioners' knowledge of users' interaction with counselling services as well as certain moral issues related to information gathering from smartphone apps which are used to explore user behaviour and develop treatment for people with mental health problems. As stated by Zhang et. al (2011), some of the drawbacks of utilising big data analysis for counselling are issues about data validation, privacy, and the precision of causal inference

Methodology

This study adopted a scoping review approach to systematically map the existing literature on the application of big data in counselling services. The researchers conducted comprehensive searches across two major academic databases, Scopus and Google Scholar, to ensure the breadth and relevance of the sources. The inclusion criteria focused on journal articles and empirical reports published in counselling that specifically addressed the integration of big data technologies. Ten journal publications and empirical reports were selected initially based on their relevance, research quality, and contribution to the discourse on big data in counselling. The selection process involved keyword searches using terms such as "big data," "counselling services," "technology in counselling," and "ethical considerations in counselling technology." Articles were screened based on title and abstract, followed by full-text reviews to determine their suitability. Subsequently, the researchers employed a scoping review methodology as outlined by Arksey and O'Malley (2005), which is particularly suited for exploring complex and emerging areas where the literature is heterogeneous. Through thematic analysis, the researchers identified and categorised the findings into three primary themes: (i) the potential of big data services in enhancing counselling practices, (ii) technological constraints and challenges faced in its adoption, and (iii) ethical considerations associated with the use of big data in counselling settings. These themes collectively reflect the central issues and opportunities presented by big data integration into counselling services, as observed across various studies and expert opinions within the reviewed literature

Results

As stated by Meehan (2017), big data can be utilised to help counsellors in developing more specific treatment programs. The analysis of big data may also be utilised to combine risk indicators and client personality characteristics to develop more focused therapeutic solutions. Big data can assist counsellors in creating more specialised treatment programs. According to Malgaroli et al (2023), the presence of risky words or phrases, as shown in client notes, is

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recognised via a selection of natural language processing algorithms. This method is very useful for identifying aspects such as suicidal thoughts, severe depression, and self-harming behaviour in the initial stage. Another advantage of big data is that practitioners may be able to keep track of therapeutic outcomes for long periods. Additionally, when counsellors have access to large amounts of data, they would find it easy to recognise patterns in emotional shifts and adjust treatment plans to fulfil clients' needs (Lewanowicz et al., 2022). Risk variables such as family problems, previous trauma, and work stress can be identified in the early stage by using predictive analysis. As such, this enables practitioners to start treatment on particular clients before their condition gets worse (Sullivan & Martin, 2018). Furthermore, as pointed out by Vaishnavi et al. (2022), pre-existing data sets are useful for developing machine learning models, which can be used to assess trends in client behaviour. Updated data can be used to adapt these models, thus increasing their relevance and accuracy. Nonetheless, as stated by Azmak et. al (2023), while some psychologists may have certain concerns about not gathering their own data, they find that the massive volumes of datasets actually allow them to save time and money, while at the same time enable them to explore a wide range of issues.

The importance of acquiring client permission to gather and utilise data has been highlighted by the American Psychological Association (2020). Unfortunately, this matter has often been overlooked, specifically in instances involving big data, and practitioners should be advised that it is extremely imperative to protect client rights and confidentiality (Mészáros et al., 2022). The use of encryption and data protection policies is a priority, given that mental health data falls into the category of sensitive information. In addition, data governance practices need to be tightened to prevent information intrusion and misuse. Studies also highlight the issue of bias in algorithms. If the training data is biased, the analysis output also risks being inaccurate and affecting certain groups (American Psychological Association, 2020).

Although big data has many advantages that support counseling services, some challenges and limitations have been identified (Grover et al., 2020). Among them is the standardization of data, especially when data is collected from multiple sources, which may have different formats and standards, and bias in the data, where data collected may not fully represent the actual population due to various reasons, such as social media users not fully representing the real population and differences in social media usage patterns across different demographic groups Sometimes data is incomplete or contradictory, which can lower the accuracy of the analysis (Baeza-Yates, 2020).

The World Health Organization (2019) emphasizes the need for significant investment in developing analytical systems, as well as the expertise of data scientists. For countries or organizations with limited resources, implementation may be limited. In addition, reported that many counselors are not yet trained to use big data or machine learning algorithms efficiently (Hsu et al., 2023). This requires specialized training and cross-disciplinary collaboration. WHO (2019) highlights the potential of using big data to influence public policy. Analysing general patterns in mental health can help direct more thorough and precise service planning. To ensure the ethical and sustainable use of big data, Chen and Chen (2022) suggest that there should be more studies involving collaboration between data scientists, counsellors, and legislators. As suggested by Fischer and Ryan (2021), extended studies are required to analyse the long-term effects of big data in counselling, specifically involving the aspects of client satisfaction evaluation and ROI (return on investment).

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Conclusion

The study results indicate that big data is advantageous for increasing diagnostic precision, improving therapies, and accelerating the identification of mental health issues. Nonetheless, thoughtful consideration must be given towards ethical and privacy issues, besides the need for professional training and reinforced technology infrastructure.

These results suggest the creation of new possibilities for counsellors; in which big data may be purposely utilised to offer a more detailed, individualised, and comprehensive therapeutic method. As shown in the study results, using big data in counselling can improve the effectiveness of interventions and enable more intensive behavioural analysis. Nonetheless, to ensure safe and efficient usage of the data, one must be prudently aware of ethical, privacy and technology-dependent issues.

Acknowledgement

The author would like to express sincere appreciation to all colleagues and institutions who provided valuable insights and encouragement during the preparation of this review article.

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