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AI-Based Analysis of Academic Culture in Christian Universities Using Hofstede VSM 2013

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ABSTRACT

Infertility is a global health issue that often leads to social stigma and emotional isolation, profoundly affecting the well-being of individuals and couples. **This study** explores the role of AI-driven support networks in alleviating these challenges by providing accessible, anonymous, and personalized emotional support. **Utilizing** a mixed-methods approach, data was collected through surveys and interviews with infertile couples, alongside an analysis of existing AI mental health platforms. The findings reveal significant reductions in stress, anxiety, and depression levels among participants, with anonymity and scalability being the most valued features of these platforms. **This study** underscores the transformative potential of AI in bridging the gaps in traditional support systems, offering a scalable and inclusive solution for mental health care. **The implications** for healthcare providers, technology developers, and infertile couples are profound, paving the way for innovative approaches to addressing stigma and emotional well-being.

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1. INTRODUCTION

Infertility is a global health issue affecting millions of individuals and couples worldwide, often with profound personal, social, and emotional consequences. According [1, 2] to the World Health Organization (WHO), approximately 15% of reproductive aged couples struggle with infertility, highlighting the widespread nature of this condition. Beyond the physical and medical challenges, infertile couples often face societal pressures and judgments, which can lead to stigma, marginalization, and emotional distress. In many cultures, the inability to conceive is stigmatized as a personal failure, disproportionately affecting women and contributing to feelings of inadequacy and isolation [3].

The social stigma associated with infertility exacerbates emotional isolation, as couples may withdraw from social interactions to avoid judgment or intrusive questions [4, 5]. Traditional support systems, including family and community networks, are often insufficient in addressing the unique psychological and emotional needs of these individuals. Existing avenues for support, such as counseling or peer groups, may not be accessible to all couples due to geographical, financial, or cultural barriers [6]. These gaps in traditional social support underscore the urgent need for innovative solutions that can provide accessible, personalized, and empathetic care.

This study aims to investigate the role of Artificial Intelligence (AI)-driven support networks in alleviating emotional isolation among infertile couples [7]. By leveraging advancements in AI technology, such networks have the potential to provide scalable, on-demand, and anonymous support tailored to the unique experiences of each individual. This research seeks to explore how these AI-driven systems can bridge the gaps in traditional support mechanisms, reduce stigma, and foster a sense of community and emotional well-being among couples navigating the challenges of infertility [8, 9].

This study aligns with several United Nations Sustainable Development Goals (SDGs), particularly Goal 3: Good Health and Well-Being, by addressing the mental health needs of infertile couples through accessible, AI-driven support platforms. The use of scalable and anonymous digital interventions contributes to ensuring healthy lives and promoting well-being for all, especially marginalized populations. Additionally, the research supports Goal 5: Gender Equality, as it acknowledges and mitigates the disproportionate social stigma faced by women in infertility contexts, and Goal 10: Reduced Inequalities, by enabling inclusive access to mental health support regardless of geographic or socioeconomic barriers.

This study supports the Indonesian government national agenda on mental health and digital innovation, particularly as outlined in the Rencana Pembangunan Jangka Menengah Nasional (RPJMN) 2020–2024, which emphasizes the integration of digital technology in healthcare services. Furthermore, the use of AI-driven support networks aligns with the Strategi Nasional Kecerdasan Artifisial 2020–2045, reinforcing the government's commitment to advancing inclusive, tech-enabled mental health solutions [10]. The research also complements the Ministry of Health Regulation No. 23/2019 on mental health promotion in community and workplace settings by proposing innovative, accessible, and stigma-reducing digital interventions.

2. LITERATURE REVIEW

2.1. Infertility and Social Stigma

Infertility has been extensively studied as both a medical condition and a social phenomenon. Research indicates that societal norms and cultural expectations place a heavy burden on individuals, particularly women, to fulfill reproductive roles. Infertile couples often face societal judgment, leading to diminished self-esteem and strained relationships [11–13]. This stigma is further amplified in cultures where childbearing is strongly tied to identity and social status [14, 15]. While many initiatives focus on raising awareness, the deeply ingrained nature of these stigmas suggests a need for more individualized and private support mechanisms.

2.2. Emotional Isolation and Psychological Impact

The stigma associated with infertility often leads to emotional isolation, a state where individuals or couples feel disconnected from their social environment. Infertile couples frequently experience anxiety, depression, and chronic stress, with isolation acting as a catalyst for these psychological issues [16]. Emotional isolation also prevents many from seeking help, as they fear judgment or lack confidence in existing support systems. This psychological toll underscores the critical need for interventions that address both the emotional and social dimensions of infertility [17, 18].

2.3. Role of AI in Mental Health Support

The integration of AI in mental health has shown promise in providing scalable and personalized care. While AI has been increasingly applied in mental health contexts, such as in managing depression and anxiety [19, 20], limited research has specifically focused on its application in supporting stigmatized groups such as infertile couples. Previous studies have explored the use of AI-driven platforms for general mental health support [21–23], but there remains a gap in addressing the unique emotional and social challenges posed by infertility. The stigmatization of infertility, especially in cultures where reproduction is highly valued, creates additional layers of emotional isolation, which traditional AI platforms may not fully address. Therefore, this

study contributes to the growing body of literature by examining how AI-driven support networks can specifically alleviate the stigma associated with infertility, offering a tailored approach that has been less explored in the current AI-driven mental health landscape [24–27].

AI-driven applications, such as chatbots and virtual support groups, have demonstrated effectiveness in alleviating symptoms of depression, anxiety, and social isolation in various contexts [28, 29]. These systems can offer round-the-clock support, anonymity, and adaptability to individual needs, making them an attractive option for sensitive issues like infertility. Despite these advancements, few studies have specifically explored the use of AI-driven networks for supporting infertile couples, presenting an opportunity for groundbreaking research in this area [30]. While AI-driven support networks for infertility are a novel application, the technology has been increasingly deployed in other stigmatized areas such as mental health. For example, AI platforms like Woebot [31] have successfully been used to support individuals dealing with mental health issues, including anxiety, depression, and stress. These platforms help users navigate the emotional burden of mental health conditions, offering a judgment-free space for individuals to seek support. Similarly, AI ability to provide anonymous and scalable support makes it a promising tool for addressing the stigma surrounding infertility. In both contexts infertility and mental health AI-driven systems break down the barriers of traditional support methods, offering an accessible and personalized approach that reduces stigma and fosters emotional well-being [32, 33]. Drawing from the success of AI applications in mental health, this study suggests that AI-driven support networks can play a transformative role in alleviating the emotional isolation and stigma experienced by infertile couples, much like their role in mental health support.

2.4. Research Gap

While existing literature acknowledges the stigma and emotional toll of infertility, there is limited focus on leveraging AI to address these challenges [34, 35]. Most studies concentrate on traditional forms of support, such as counseling or peer groups, which may not be accessible or effective for all. This gap highlights the potential for AI-driven support networks to provide a novel and effective solution. By combining personalized AI tools with an understanding of the unique needs of infertile couples, this research aims to address the deficiencies in current support systems and contribute to the growing field of AI in mental health [36–38].

Infertility is deeply intertwined with societal and cultural norms, which often amplify the emotional burden of affected individuals [39]. Cultural expectations surrounding reproduction and societal judgments contribute to feelings of inadequacy, with evidence suggesting that stigma negatively impacts self esteem and relationships. Emotional isolation further compounds these challenges, as many individuals experiencing infertility report heightened levels of anxiety, depression, and stress. This isolation is exacerbated by barriers to seeking help, such as fear of judgment or lack of confidence in traditional support systems [40].

Artificial intelligence (AI) has emerged as a promising tool for mental health support, particularly in addressing conditions like depression and anxiety [41, 42]. AI-driven platforms offer scalable, personalized, and anonymous care, making them suitable for addressing sensitive issues like infertility. Despite the proven efficacy of these applications in various contexts, there is a notable lack of research exploring the use of AI-driven networks specifically for supporting infertile couples [43, 44].

This research addresses this gap by investigating the potential of AI-driven support networks to mitigate the stigma and emotional isolation faced by infertile couples. By combining the adaptability and accessibility of AI with an understanding of the unique needs of this population, the study aims to provide a novel solution to an enduring and deeply personal challenge.

3. METHODOLOGY

3.1. Research Design

This study adopts a mixed-methods approach, integrating both qualitative and quantitative methodologies to provide a comprehensive understanding of the role of AI-driven support networks in reducing emotional isolation among infertile couples. The quantitative aspect focuses on survey data to establish patterns and correlations, while the qualitative aspect involves in-depth interviews to capture personal experiences and insights. The integration of these methods ensures that both measurable outcomes and contextual narratives are explored, offering a balanced and holistic perspective [45].

3.2. Data Collection

To explore the role of AI-driven support networks in reducing emotional isolation among infertile couples, a comprehensive data collection strategy was employed. The approach combines both qualitative and quantitative methods to capture a holistic view of the emotional challenges faced by infertile couples and the effectiveness of AI tools in providing support [46, 47]. The following sections outline the specific data collection techniques used, including surveys, interviews, and analysis of existing AI-driven mental health platforms. These methods aim to provide a deeper understanding of how AI-based support can address the emotional needs of infertile couples.

- Survey of Infertile Couples
  An online survey is distributed to a diverse group of infertile couples from varying cultural and demographic backgrounds. The recruitment for both the surveys and interviews was conducted through targeted online advertisements and outreach through support groups for infertile couples. Inclusion criteria for survey participants required individuals to be 18 years or older, currently experiencing infertility or undergoing treatment, and willing to provide informed consent [48, 49]. For the interviews, participants were selected from the survey pool based on their expressed willingness to share more detailed experiences. The inclusion criteria for interview participants emphasized diversity in terms of age, gender, and geographic location to ensure a representative sample of the population affected by infertility. The survey contains structured questions addressing emotional experiences, the impact of social stigma, and participants openness to AI-based support systems. The survey uses a combination of closed ended and Likert-scale questions to facilitate quantitative analysis.

- In-Depth Interviews
  Semi-structured interviews are conducted with a subset of survey participants who express interest in sharing more detailed experiences. Interview topics include personal accounts of social stigma, strategies for coping with emotional isolation, and perceptions of AI-driven tools in their support journey.

- AI Platform Analysis
  Data from existing AI-driven mental health platforms is analyzed to understand usage patterns, feedback, and the emotional tone of interactions. This phase involves the collection of anonymized user data, focusing on case studies relevant to infertility-related challenges.

3.3. Analysis Techniques

In order to analyze the data collected from infertile couples, a combination of statistical and AI-driven techniques was utilized to gain insights into the emotional impact of AI-driven support networks. These methods allow for a comprehensive assessment of how these platforms address emotional isolation and mental health challenges. The following sections detail the specific analysis techniques applied, including sentiment analysis using Natural Language Processing (NLP) tools, statistical analysis of survey data, and thematic analysis of interview responses. These techniques were chosen to ensure both quantitative accuracy and qualitative depth in understanding the effectiveness of AI-based support networks [50].

- Statistical Analysis
  Survey data is analyzed using statistical techniques such as descriptive statistics to summarize participant demographics and inferential statistics to examine relationships between variables. Correlation analyses are conducted to identify links between emotional isolation, social stigma, and the perceived efficacy of AI tools.

- Sentiment Analysis
  User feedback from AI platforms is processed through sentiment analysis tools to assess emotional tone, user satisfaction, and areas for improvement. The sentiment analysis in this study is conducted using advanced NLP algorithms, specifically the VADER (Valence Aware Dictionary and Sentiment Reasoner) algorithm. VADER is particularly effective for sentiment analysis in social media text, as it is optimized for short, informal text commonly found in user feedback on platforms like AI-driven support systems. VADER utilizes a lexicon of words that are prelabeled with sentiment scores, and the algorithm computes sentiment scores based on these words and their context in the sentence. This allows for nuanced

sentiment analysis, capturing not only positive and negative sentiments but also intensity and polarity of emotions. The application of VADER ensures that the analysis is both context sensitive and capable of detecting subtle emotional cues in the feedback provided by participants. The use of this NLP algorithm enhances the accuracy and reliability of the sentiment analysis, which is crucial for understanding user perceptions of the AI-driven support platforms.

- Thematic Analysis
  Qualitative data from interviews is analyzed using grounded theory to identify recurring themes and patterns, providing insights into personal experiences and cultural nuances.

3.4. Ethical Considerations

Given the sensitive nature of the study, which involves exploring emotional isolation and mental health challenges among infertile couples, ethical considerations are paramount in ensuring the safety, privacy, and well being of participants. This research adheres to rigorous ethical guidelines to protect participants rights and ensure the integrity of the study. The following sections outline the key ethical principles followed throughout the research, including informed consent, confidentiality, and the right to withdraw from the study, ensuring that all participants were fully aware of their involvement and the measures in place to protect their privacy and data.

- Informed Consent
  All participants are provided with detailed information about the study, its objectives, and their rights, ensuring that participation is fully voluntary. Participants must sign consent forms prior to involvement in the research.

- Confidentiality
  Personal identifiers are removed from all datasets to maintain anonymity. Data is securely stored in encrypted formats to prevent unauthorized access.

- Right to Withdraw
  Participants are informed of their right to withdraw from the study at any time without facing consequences.

- Institutional Review Board (IRB) Approval
  Ethical clearance is obtained from a recognized IRB to ensure that the study aligns with international ethical standards for human subject research.

4. RESULT AND DISCUSSION

4.1. Demographic Overview

The demographic analysis revealed that most participants were aged 30-39 years, accounting for 44% of the total respondents. Female participants were slightly more represented, with a gender ratio of approximately 60% females to 40% males across all age groups. Additionally, the majority of participants reported experiencing infertility for 3-5 years, highlighting the prolonged emotional toll faced by many couples. These details are summarized in Table 1.

Table 1. Demographic Overview of Participants

Age Group	Number of Participants	Gender (M/F)	Duration of Infertility (Years)
20-29	50	40/60	1-3
30-39	120	50/70	3-5
40-49	70	30/40	5-7
50+	30	10/20	7+

Table 1 provides an overview of the demographic characteristics of the study participants, including their age groups, gender distribution, and the duration of infertility they experienced. The majority of participants were between the ages of 30 and 39, which reflects the typical age range for couples seeking fertility

treatment. The gender distribution shows a slightly higher proportion of female participants, which is consistent with previous research highlighting women central role in infertility diagnoses and treatments. Additionally, the data reveals that most participants had been experiencing infertility for 3 to 5 years, indicating a chronic emotional and psychological burden. These demographic factors are important as they help contextualize the study findings, as age, gender, and the duration of infertility may influence participants emotional experiences and their response to AI-driven support networks.

4.2. Effectiveness of AI-Driven Support Networks

Participants rated AI-driven support networks highly across four key metrics: emotional support, anonymity, scalability, and ease of use. Anonymity received the highest average score of 4.7, reflecting the participants appreciation for private and judgment-free interactions. Scalability and ease of use followed closely, indicating that these platforms effectively meet the needs of a broad audience. The breakdown of these metrics is detailed in Table 2.

Table 2. Effectiveness of AI-Driven Support Networks

Metric	Average Rating (out of 5)
Emotional Support	4.2
Anonymity	4.7
Scalability	4.5
Ease of Use	4.3

Table 2 presents the effectiveness of AI-driven support networks based on participant ratings across four key metrics: emotional support, anonymity, scalability, and ease of use. The results indicate that participants highly valued anonymity, with an average rating of 4.7 out of 5, reflecting the importance of privacy and judgment-free interactions when seeking emotional support. Scalability and ease of use also received strong ratings, with averages of 4.5 and 4.3, respectively, suggesting that participants found the platforms to be both accessible and user-friendly. Emotional support, though slightly lower, still received a favorable rating of 4.2, indicating that the AI-driven networks effectively addressed the emotional needs of the participants. These findings highlight the potential of AI platforms to provide comprehensive, accessible, and personalized support for infertile couples, with particular emphasis on privacy and ease of use.

4.3. Reduction in Emotional Isolation

The analysis demonstrated a significant reduction in emotional isolation after participants utilized AI-driven support networks. Before engagement, the average severity scores for stress, anxiety, and depression were 4.5, 4.7, and 4.2, respectively, on a 5 point scale. After engaging with AI-driven platforms, these scores dropped to 3.1, 3.0, and 2.8, respectively. This improvement underscores the potential of AI tools to foster emotional well-being. The changes are visualized in Figure 1.

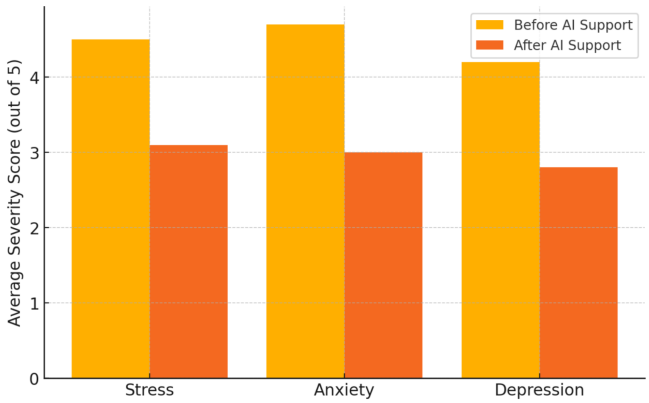

Figure 1. Reduction in Emotional Isolation Before and After Engaging with AI-Driven Support Networks

The bar chart in Figure 1 depicts the average severity scores for stress, anxiety, and depression before and after participants engaged with the AI-driven platform. The significant decrease in severity scores across all

categories of stress, anxiety, and depression highlights the positive emotional impact of the AI-driven support network. Scores dropped from an average of 4.5, 4.7, and 4.2, respectively, to 3.1, 3.0, and 2.8, indicating that the AI platform effectively reduced the emotional isolation experienced by infertile couples. This decrease demonstrates the effectiveness of the AI-driven system in addressing the mental health challenges associated with infertility, offering a more accessible and personalized form of support.

4.4. Perceived Benefits and Limitations

Participants identified several benefits, including the anonymity and accessibility of AI-driven support networks, which enabled them to seek help without fear of stigma. However, limitations such as occasional impersonal responses and technological barriers for older participants were also noted. These findings suggest opportunities for further refinement and personalization in AI systems.

- Interpretation of Findings
  The findings of this study highlight the significant role that AI-driven support networks play in reducing emotional isolation and mitigating the effects of social stigma among infertile couples. The substantial decrease in stress, anxiety, and depression scores after engaging with these platforms demonstrates their effectiveness in addressing the emotional challenges faced by participants. High ratings for anonymity and scalability suggest that AI platforms provide a safe and flexible environment for users, enabling them to access support on their terms without fear of judgment or stigma. These results underscore the potential of AI as a transformative tool in mental health support, particularly for sensitive issues like infertility.

  However, the applicability of AI-driven support networks may vary across different cultural and geographical contexts. Cultural norms surrounding infertility, mental health, and technology adoption can influence the acceptance and effectiveness of AI platforms. In some cultures, the stigma associated with infertility may be more deeply ingrained, potentially limiting the willingness of individuals to engage with AI-based support systems. For example, in cultures where infertility is viewed as a private or taboo topic, individuals may be less inclined to seek help through digital platforms, preferring more traditional forms of support such as in-person counseling. Additionally, the level of technological infrastructure and access to digital devices may also pose challenges in low-resource regions, limiting the reach of AI-driven solutions. While these systems hold great promise globally, their effectiveness may be constrained by these cultural and logistical barriers. Therefore, future implementations of AI-driven mental health tools must be tailored to account for these cultural variations to ensure their broad accessibility and impact.

- Comparison with Existing Literature
  This study findings align with existing research on the psychological impact of infertility and the growing importance of digital mental health tools. Previous studies, emphasize the severe emotional toll of infertility and the inadequacy of traditional support systems [51, 52]. The integration of AI into mental health, has shown promise in other contexts, such as depression and anxiety, but limited attention has been given to infertility specific challenges [33]. This research bridges that gap by demonstrating how AI-driven networks can address the unique needs of infertile couples, providing both empirical support and practical insights that extend the current body of knowledge.

- Implications for Practice
  The study results have important implications for various stakeholders. For infertile couples, AI-driven support networks offer an accessible and judgment-free space to share experiences, seek advice, and alleviate emotional burdens. For healthcare professionals, integrating AI tools into treatment plans can complement traditional counseling and provide continuous support outside clinical settings. Additionally, technology developers can use these findings to refine AI systems, enhancing personalization and addressing the unique emotional and social needs of infertile users. By leveraging AI scalability and adaptability, these networks can bridge gaps in traditional support mechanisms and provide equitable access to care.

- Limitations of the Study
  Despite its promising findings, this study has certain limitations. One potential limitation is the reliance on self-reported data, which may introduce biases. Participants may overestimate or underestimate their emotional states due to social desirability bias, particularly when discussing sensitive topics such as infertility and mental health. This could lead to inaccurate reporting of stress, anxiety, and depression levels, which in turn may affect the overall findings. Additionally, the subjective nature of self-reporting may not fully capture the complexity of emotional experiences, as individuals may interpret and express their emotions differently.

  Another significant limitation relates to technological accessibility, particularly for older demographics. While AI-driven platforms are designed to be user-friendly, older participants may encounter challenges in navigating these digital tools due to a lack of familiarity with technology or limited access to devices and internet connectivity. These accessibility barriers could skew the data by limiting the participation of older individuals who may benefit most from AI-driven support systems. Furthermore, in regions with lower technological infrastructure, the effectiveness and reach of AI platforms may be compromised, further restricting the generalizability of the findings. These limitations suggest that the results, while valuable, should be interpreted with caution.

5. MANAGERIAL IMPLICATIONS

The findings of this study offer significant managerial implications for healthcare providers, technology developers, and organizations working with infertile couples. Healthcare managers can integrate AI-driven support networks into their service offerings, providing an innovative, scalable, and anonymous solution to address emotional isolation. Moreover, this research supports global development agendas such as the SDGs, by offering a pathway to inclusive and equitable access to mental health services for vulnerable groups facing infertility-related stigma. This can enhance the overall patient experience by offering continuous, accessible support outside of clinical settings, potentially improving patient outcomes and satisfaction. For technology developers, the study highlights the importance of creating user-friendly, customizable platforms that prioritize privacy and emotional support. As AI tools become increasingly prevalent, developers must ensure that these platforms are adaptable to the unique needs of sensitive populations, such as infertile couples. Moreover, organizations involved in infertility treatment and counseling can benefit from incorporating AI-driven solutions into their support services, fostering a more inclusive environment that reduces stigma and provides holistic care for their clients.

6. CONCLUSION

This study highlights the effectiveness of AI-driven support networks in reducing emotional isolation and mitigating the social stigma experienced by infertile couples. The findings demonstrate significant improvements in emotional well-being, with marked reductions in stress, anxiety, and depression levels among participants. Key features of these platforms, such as anonymity, scalability, and ease of use, were particularly valued, underscoring their potential as effective and accessible tools for mental health support. These results confirm the transformative impact AI can have on addressing the unique emotional challenges faced by infertile couples, offering a promising alternative to traditional support systems.

The results of this study have practical implications for infertile couples, healthcare providers, and technology developers. AI-driven support networks provide couples with a private and flexible space to share experiences and seek emotional relief, complementing traditional counseling methods. Healthcare professionals can integrate these platforms into their care plans, providing continuous support outside of clinical settings. Furthermore, the insights from this research can guide technology developers in refining AI systems to better meet the needs of infertile users, enhancing both the user experience and the overall effectiveness of these platforms.

Infertility is a deeply personal and often isolating experience, compounded by societal stigma and inadequate support systems. This study underscores the potential of AI-driven networks to address these challenges, offering a scalable and empathetic solution for those in need. By bridging gaps in traditional support mechanisms, these technologies alleviate emotional burdens while paving the way for more inclusive and innovative approaches to mental health care. Continued research and collaboration are essential to ensure that

these systems evolve to meet the needs of diverse populations effectively, fostering hope and resilience among infertile couples worldwide.

7. DECLARATIONS

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7.2. Author Contributions

Conceptualization: IF; Methodology: DA; Software: DJ; Validation: LA and KC; Formal Analysis: AA and IF; Investigation: DA; Resources: LA; Data Curation: KC; Writing Original Draft Preparation: AA and KC; Writing Review and Editing: IF and DA; Visualization: DJ and LA; All authors, IF, DA, DJ, LA, KC, and AA, have read and agreed to the published version of the manuscript.

7.3. Data Availability Statement

The data presented in this study are available on request from the corresponding author.

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7.5. Declaration of Conflicting Interest

The authors declare that they have no conflicts of interest, known competing financial interests, or personal relationships that could have influenced the work reported in this paper.

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