Review Article

doi:10.31674/mjn.2026.v17i04.019

MJN

Trauma-Informed Care Instruments for Nursing in Natural Disaster-Prone Areas: A Systematic Review

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ABSTRACT

Background: Nurses play a crucial role not only in clinical management but also in preventing psychological trauma, especially in disaster-prone settings. Trauma-Informed Care (TIC) is a key strategy, and its implementation requires the use of valid and reliable instruments. This systematic review aims to identify TIC assessment tools and analyze their application across different disaster phases. **Methods:** A systematic review was conducted following the PRISMA guidelines. Literature searches were performed in five databases (PubMed, ScienceDirect, Emerald, ProQuest, and Sage Journals) using keywords, covering publications from 2015 to 2024. **Results:** Nine TIC instruments were identified and grouped into three categories: (1) Individual attitudes and competencies The Attitudes Related to Trauma Informed Care (ARCTIC), Knowledge, Attitudes, and Practices related to Trauma-Informed care (KAP-TIC), Nurses' Intention to Care for Patients with Infectious Disease Scale (NICPS), Measuring TIC-Nurses). (2) Organizational readiness and culture (TICO Meter, Organizational Trauma Resilience Assessment (OTRA)), and (3) Specific clinical practices (TIC-PAT, Trauma-Informed Practice (TIP) Scale). Instruments such as ARTIC and the Trauma-Informed Care Provider Assessment Tool (TIC-PAT) are suitable for the initial phase of a disaster, allowing for the rapid assessment of healthcare workers. Meanwhile, TICO Meter and OTRA are effective for evaluating organizational readiness and resilience during response and rehabilitation. The TIP Scale is particularly relevant in the recovery phase to empower survivors. **Conclusion:** Nine TIC instruments can be integrated into different phases of disaster management: ARTIC and TIC-PAT for early assessment, TICO Meter and OTRA for organizational readiness during response and rehabilitation, and the TIP Scale for recovery. Training and systematic use of these tools enable nurses to deliver compassionate, safe, and resilient care in disaster-prone settings.

Keywords: Disaster-Prone Areas; Nursing Assessment; Trauma-Informed Care Instrument

INTRODUCTION

Indonesia is a country prone to natural disasters, with a high frequency of events, like earthquakes, floods, tsunamis, and volcanic eruptions (Suparji *et al*., 2024). The impact of these disasters is not only physical and economic but also causes profound psychological trauma for survivors (Mustikasari *et al*., 2018). In these situations, nurses play a crucial role as the frontline in providing healthcare services, not only treating acute physical conditions but also preventing and identifying psychological trauma that has the potential to develop long-term psychological disorder (Farokhzadian *et al*., 2024; Wijoyo *et al*., 2020). In these situations, healthcare workers, especially nurses, play a vital role as the frontline providers of healthcare services, both during the emergency response and recovery phases (Labrague & Hammad, 2024). However, limited resources, high work pressure, and exposure to patient suffering often leave nurses facing a double burden: managing both clinical conditions and complex psychological impacts. The challenges in responding to disasters are complex, including resource constraints, emotional burdens, and a high risk of burnout among healthcare workers (Usset *et al*., 2024).

Nurses are always present and play a crucial role in natural disaster situations (Firouzkouhi *et al*., 2021). During disasters, nurses apply specialized knowledge and skills, as well as activities, to minimize health and life-

Received: July 16, 2025 Received in revised form: February 16, 2026 Accepted: February 26, 2026

threatening disaster risks for victims (Farokhzadian *et al*., 2022). Skills can be acquired through nursing education or through experience in providing healthcare services in disaster areas or where nurses work (Brinjee *et al*., 2021; Said & Chiang, 2020). Nurses need to enhance their skills to effectively care for patients in disaster-prone areas who have been traumatized.

These skills include identifying trauma events, awareness of emergency response plans and regular drills, proper use of emergency equipment such as personal protective equipment, following evacuation routes and communication channels, participating in drill evaluations, and modifying response plans as necessary (Benson *et al*., 2024; Firouzkouhi *et al*., 2021; Kwikima & Daud, 2025). Nurses' clinical skills in crises include technical efficiency, the ability to utilize nursing techniques with specialized equipment, the capacity to perform physical examinations, clinical decision-making skills, triage and trauma skills, flexibility, and the ability to perform tasks effectively in crises (Afseth, 2022; Elliott, 2022). After improving nurses' skills, it is necessary to evaluate nurses' perceptions of their skills and competencies in providing care in disaster-prone areas.

To address this challenge, the Trauma-Informed Care (TIC) approach is a crucial strategy in trauma prevention, both for survivors and healthcare workers themselves (Alhassan *et al*., 2025; Grossman *et al*., 2021; Guest, 2021). However, implementing TIC requires understanding and valid measuring instruments tailored to the local context (Forkey *et al*., 2021). Various instruments have been developed in various countries to assess attitudes, competencies, organizational readiness, and clinical practices related to TIC (Bassuk *et al*., 2017; Xia *et al*., 2024).

Trauma prevention that is not carried out correctly can have a profoundly traumatic impact on individuals' lives, so nurses must be aware of this (Bailey *et al*., 2023). This prevention will emphasize the impact that will occur on nurses, such as facing psychological distress, work stress, health problems, family concerns, organizational problems, poor coordination, and low public awareness, which can affect their well-being and ability to respond effectively (Al Harthi *et al*., 2020; Farokhzadian *et al*., 2022; Loke *et al*., 2021). Building knowledge, skills, and motivation around trauma, or creating trauma awareness, provides the foundation for nurses to implement trauma-informed care or a trauma-informed "approach" where individuals are trained to implement such interventions (İnci *et al*., 2025; Mitchell *et al*., 2021). Today, this concept is known as Trauma-Informed Care (TIC). Therefore, valid and reliable instruments are needed to assess nurses' readiness and ability to implement trauma prevention based on the Trauma-Informed Care (TIC) approach. To date, there have been limited studies systematically reviewing the instruments used in this context, particularly those relevant to natural disasters. This systematic review aimed to identify and analyze instruments that can be utilized in nursing practice in areas prone to natural disasters, as well as to evaluate their advantages, limitations, and potential adaptations to support trauma prevention interventions in the field.

METHODOLOGY

The review protocols were registered in the international prospective register of systematic reviews (PROSPERO) under the ID CRD42025639345. The PRISMA 2020 flow diagram illustrating the screening and selection process is provided in figure 1. No meta-analysis was conducted.

Literature Search Strategy

This systematic review was developed based on the PRISMA 2020 checklist to ensure methodological rigor and transparency (Page *et al*., 2021). A comprehensive literature search was conducted across five databases: PubMed, ScienceDirect, Emerald, ProQuest, and SAGE Journals. The search was limited to studies published between 2015 and 2024 to capture contemporary findings. Search terms included "trauma-informed care," "trauma-informed practice," "trauma-informed approach," and "disaster area." Articles were included if they were peer-reviewed research or review articles, focused on trauma-informed care, were published in English, and related to the implementation of TIC in disaster-prone or trauma contexts. Exclusion criteria included did not assess or apply TIC principles, did not contain a measurable or conceptual TIC component, did not contribute substantially to TIC conceptual understanding, and focused solely on specific cognitive-behavioral interventions outside the scope of TIC.

Selection Process

Two independent reviewers conducted the study selection process to minimize selection bias and ensure methodological rigor. Initially, all records identified through database searching and additional sources were

imported into reference management software, and duplicate studies were removed. Subsequently, titles and abstracts were screened independently using predefined eligibility criteria based on the study objectives and inclusion-exclusion framework.

Potentially relevant studies were retained for full-text assessment. Disagreements between reviewers during the screening stage were discussed collaboratively to reach a consensus. When consensus could not be achieved, a third reviewer (Mus), acting as a research supervisor, was consulted to make the final decision. Full-text articles meeting preliminary eligibility were further assessed using a standardized screening form to ensure consistency in study inclusion. Reasons for exclusion at the full-text stage were documented to maintain transparency and reproducibility of the review process. The overall study selection procedure followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines.

Data Collection

Data extraction was performed independently by two reviewers using a predefined, pilot-tested data extraction form to ensure clarity, consistency, and completeness of the collected information. Before the main extraction process, the form was tested on a subset of selected studies and refined accordingly. Extracted data included key study characteristics such as author(s), year of publication, country or study setting, study design, participant characteristics, and study objectives. In addition, specific information related to the Trauma-Informed Care (TIC) framework was collected, including the conceptual framework or model used, the measurement instruments or indicators employed, the intervention components, and the reported implementation outcomes. The summarized extracted data are presented in Table 3.

To ensure reliability, both reviewers compared extracted datasets after completion. Any discrepancies or inconsistencies were resolved through discussion and consensus. If disagreements persisted, consultation with the third reviewer was undertaken to reach a final agreement. This multi-reviewer extraction approach was applied to enhance data accuracy and reduce reviewer bias throughout data collection.

Quality Assessment and Risk of Bias Assessment

Risk of bias was assessed for each included study using the COSMIN (Consensus-based Standards for the Selection of Health Measurement Instruments) (Table 2) critical appraisal checklist, appropriate to the study design. Each study was appraised by two reviewers. Judgments were reported for each criterion, and overall appraisal scores were recorded.

RESULTS

The PRISMA 2020 flow diagram illustrating the screening and selection process is provided in figure 1.

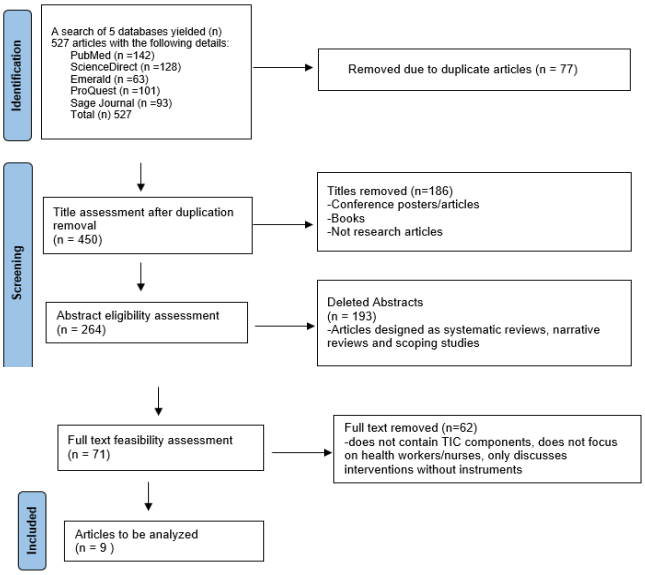

Figure 1: Prisma Flow Diagram

Study Characteristic

The dimensions were measured with the instruments analyzed in this study. In general, three main dimensions consistently appear in most instruments: knowledge, attitudes, and practices or skills. Knowledge related to trauma and TIC principles (8/9 instruments); attitudes of health workers toward the application of TIC (5/9 instruments); and practices in providing trauma-informed care (8/9 instruments). An explanation of each domain in the instrument is as follows (Table 1).

Table 1: List of Instruments to be Analyzed and Domain in Instrument

No	Instrument	Initial	Know**	Atti	Prac	OrgaCul	Coll	TraRes	Stren	SS	PS
1	*The Attitudes Related to Trauma Informed Care* (ARTIC Baker *et al*. (2016))	Ins*1	+	+	+	+	-	-	-	-	-
2	The TICO Meter (Bassuk *et al*., 2017)	Ins2	+	-	+	+	+	-	-	-	-
3	*Organizational Trauma Resilience Assessment* (OTRA) Brown *et al*. (2023)	Ins3	+	-	+	+	+	+	+	-	-
4	*Knowledge, Attitudes, and Practices related to Trauma - Informed care of Trauma - Informed Practice* Abdoh *et al*. (2017)	Ins4	+	+	+	-	-	-	-	-	-
5	*Knowledge, Attitude, and Practice Related to Trauma - informed Care* King *et al. (*2019)	Ins5	+	+	+	-	-	-	-	-	-
6	*Measuring Trauma -Informed Care of Nurses Working with Traumatically Injured Patients* Xia *et al*. (2024)	Ins6	+	+	+	-	-	-	-	-	-
7	*Trauma-Informed Care Provider Assessment Tool* (TIC-PAT) Hanson *et al*. (2024)	Ins7	+	+	+	-	+	+	-	-	+
8	*Nurses' Intention to Care for Patients with Infectious Disease Scale* (NICPS) Hoseinzadeh *et al*. (2024)	Ins8	-	-	-	-	-	-	-	+	-
9	*Trauma-Informed Practice* (TIP) *Scale* Goodman *et al*., (2016)	Ins9	+	-	+	-	+	-	+	-	+

**Note- Ins.: Instrument; Know: Knowledge; Atti: Attitude; Prac: Practice; OrgaCul: Organizational Culture; Coll: Collaboration; TraRes: Trauma Responsiveness; Stren: Strength-Based; SS: Social Support; PS: Patient Support.*

Risk of Bias

The analysis results were based on COSMIN (Consensus-based Standards for the Selection of Health Measurement Instruments), which assesses nine instruments to evaluate the quality of measurement tools based on psychometric properties. The most comprehensive instruments according to COSMIN are Ins1, Ins2, Ins3, Ins6, Ins7, Ins8, and Ins9. Instruments requiring further development are Ins4 and Ins5. Instruments that utilize cross-cultural validity can be found in Ins6 and Ins8. The following results were obtained (Table 2).

Table 2: Analysis Based on COSMIN

No	Instrument	CV*	SV	IC	Rel	CC	Resp	Hypothesis testing
1	Ins1	+	+	+	+	?	-	+
2	Ins2	+	+	+	+	-	-	+
3	Ins3	+	+	+	+	-	-	+
4	Ins4	?	-	-	?	-	-	?
5	Ins5	+	?	+	+	-	-	+
6	Ins6	+	+	+	+	+	-	+
7	Ins7	+	+	+	+	-	-	+
8	Ins8	+	+	+	+	+	-	+
9	Ins9	+	+	+	+	?	-	+

**Note: CV: Content Validity; SV: Structural Validity; IC: Internal Consistency; Rel: Reliability; CC: Cross-Cultural; Resp: Responsiveness. (+): Available; (?): unclear; (-): Not available*

Review finding

Nine articles relevant to the systematic review topic, specifically trauma prevention instruments for nursing in disaster-prone areas, are reviewed and described in the chart below (Table 3).

Table 3: Assessment Instrument for Evaluating the Implementation of Care for Patients with Trauma

No	Ins.	Author/year/ country	Population	TIC Framework	Assessment Domain/ Indicators	Reliabilities	Implementation Outcome
1	Ins1	Baker *et al*. (2016)/ USA	Conducted on 760 staff	SAMHSA* Principle	Consisting of 7 domains and 45 questions	Cronbach's alpha value 0.93	Positive attitudes towards TIC, related to burnout
2	Ins2	Bassuk *et al*. (2017)/ USA	Conducted at 68 health and human services organizations and 424 service providers online	TIC Organizational readiness	Consisting of six domains and 35 questions	Cronbach's alpha value 0.92	Measuring organizational readiness for TIC
3	Ins3	Brown *et al*. (2023) / USA	Conducted on 861 people at 12 sites in the United States	Organizational Resilience	Consisting of five domains with 40 questions	Cronbach's alpha value 0.968 (0.818-0.949)	Assessing trauma resilience in organizations
4	Ins4	Abdoh *et al*., (2017) / Saudi Arabia	Given to 17 people at ASC (Alexander Streets Community)	Not explicitly stated	Contains 3 domains with 36 questions	Cronbach's alpha values are not explained in the article	TIC knowledge & practice increased
5	Ins5	King *et al*. (2019)/ USA	511 health workers	SAMHSA Principle	Contains three domains with 21 questions	Cronbach's alpha values for the Knowledge domain are 0.8592; Behavior: 0.7593; and Practice: 0.7735	TIC assessment score of knowledge and attitude is good
6	Ins6	Xia *et al*. (2024) / China	293 Nurses in China in hospitals	SAMHSA Principle	Contains three domains with 30 questions	Cronbach's alpha value is 0.939 and its validity value is 0.971	TIC practice depends on training and experience
7	Ins7	Hanson *et al*. (2024) / USA	176 physicians practicing in primary care	TIC in Primary Care	The 5 domains that make up the TIC are 10 items	Cronbach's alpha value 0.98	Trauma screening and collaboration increased
8	Ins8	Hoseinzadeh *et al*. (2024) / Iran	Conducted on infectious room nurses in 455 nurses	Not specific in TIC	Consisting of three domains with 17 questions	Cronbach's alpha values were 0.87, 0.84, and 0.74	Social support and motivation increase the intention to care for patients with trauma
9	Ins9	Goodman *et al*., (2016)/ USA	Female victims of domestic violence in the United States with a sample of 388	TIC in Survivors	Contains six domains with 48 items	Cronbach's alpha value 0.85-0.98	TIC increases empowerment & coping

Note- SAMHSA: Substance Abuse and Mental Health Services Administration

DISCUSSION

The author conducted a systematic review to provide an overview of instruments that can be used for trauma prevention. Several categories emerged from the nine articles: individual attitudes and competencies, organizational readiness and culture, and clinical and practice specifications.

Individual attitudes and competencies

Individual attitudes and competencies can be assessed using the ARTIC (Baker *et al*., 2016), KAP-TIC (Abdoh *et al*., 2017; King *et al*., 2019), NICPS (Hoseinzadeh *et al*., 2024), and Measuring Nurses' TIC (Xia *et al*., 2024) instruments. This is because these instruments focus on assessing the knowledge, attitudes, and behaviors of healthcare workers. ARTIC is the most comprehensive, with an emphasis on individual belief-response. For the organizational readiness and culture category are the TICO Meter (Bassuk *et al*., 2017) and OTRA (Brown *et al*., 2023). This is because the primary domain or focus is on policy, collaboration, a culture of trust, and social support.

Meanwhile, the specific clinic/practice category also explained that its primary focus is on screening, patient-centered communication, parental support, and the presence of domestic violence (Aljomaie *et al*., 2022; Montesanti *et al*., 2023). Considering the context of instrument use, it can be concluded that the instrument can be applied in various settings, including primary care, referral hospitals, human service organizations, and trauma victim assistance (Brown *et al*., 2023; Goodman *et al*., 2016; Xia *et al*., 2024). Therefore, the analyzed instruments can be utilized in trauma-affected areas, such as those affected by natural disasters. Nine instruments will reveal knowledge gaps, including language and cultural adaptation, but none are available in Indonesian. Further cross-cultural validation can be conducted for instrument development in Indonesia.

Instrument development in natural disaster areas is crucial because nurses/healthcare workers will handle acute physical and mass psychological trauma (Farokhzadian *et al*., 2022). Furthermore, nurses also work in conditions with limited resources and limited volunteer rotation (Mustikasari *et al*., 2018; Wijoyo *et al*., 2023). Furthermore, the transition period from the disaster phase also requires a quick, concise, and valid instrument to identify potential problems (Albahri *et al*., 2024; Ghaffarian *et al*., 2023). The ARTIC instrument features a concise version, ARTIC, which is ideal for use during the first week of a natural disaster (Baker *et al*., 2020). This is crucial for mapping cross-professional preparedness in handling natural disasters. The NICPS, meanwhile, focuses on nurses' intentions to care for patients with infectious diseases during a natural disaster (Hoseinzadeh *et al*., 2024). This can be utilized by adding a brief module on safety and re-traumatization to support nurses' trauma prevention efforts (Berring *et al*., 2024). This instrument also assesses social support, spiritual motivation, and job satisfaction (Guest, 2021). Furthermore, the Measuring TIC-Nurse instrument can be used during natural disasters, from the golden hour phase through rehabilitation in referral hospitals or field hospitals treating physical injuries and fractures (Xia *et al*., 2024). Since this instrument was developed in China, further assessment and testing are necessary when it is adapted for use in new regions, especially those prone to natural disasters.

Organizational readiness and culture

When viewed through the categories of readiness and organizational culture in the context of facing natural disasters, the organization can utilize the TICO Meter questionnaire (Bassuk *et al*., 2017) and the OTRA (Brown *et al*., 2023), which can be developed to assess the organization's readiness to face natural disasters. This instrument assesses not only individuals but also organizations. Domains in TICO Meter include as many as six domains, ranging from trauma-based knowledge and skills to trusting relationships, respect, provision of TIC services, and policies/procedures that support TIC (Bassuk *et al*., 2017). In addition, this instrument also assesses multidisciplinary health workers, not only specific to one health worker. Additionally, the TICO Meter is also suitable for use in areas affected by natural disasters during the rehabilitation phase. This is possible because the TICO Meter instrument assesses the system or organization, not just individuals, allowing it to be used in natural disasters with significant impacts. At the same time, the OTRA instrument assesses organizational resilience to the impacts that occur (Brown *et al*., 2023). When viewed in the context of a natural disaster, this instrument will assess whether staff are trained to deal with trauma situations and whether they intend to remain. This is vital for the long-term retention of healthcare workers at disaster sites. Furthermore, this instrument also assesses service organizations when faced with logistical crises, staff burnout, and the emotional complexities of survivors during a natural disaster (Bassuk *et al*., 2017; Brown *et al*., 2023). Both are crucial in natural disaster areas because they assess the organizational level, not just the individual. This enables systemic change for the continuation of humane, safe, and effective trauma care.

Clinical and practice specifications

The TIC-PAT instrument can be utilized in emergency services, particularly during natural disasters (Hanson *et al*., 2024). This instrument is short and assesses the ability and preparedness of individuals (healthcare workers) to handle the impact of a natural disaster, particularly in trauma prevention. Furthermore, screening is crucial because natural disaster survivors tend to be at high risk for psychological trauma. Therefore, the TIC-PAT instrument can be effectively implemented in areas affected by natural disasters.

Furthermore, the TIP scale is an instrument used to assess victim empowerment and resilience (Goodman *et al*., 2016). This assessment is crucial to prevent re-traumatization and can also enhance their sense of control and self-esteem. However, the TIP-Scale is an instrument that can only be used during the rehabilitation phase of a natural disaster, not during the crisis itself. A variety of high-quality instruments exist to measure the implementation of Trauma-Informed Care at both the individual and organizational levels (Ashworth *et al*., 2023). Although internal reliability is generally high, evidence of cross-cultural and predictive validity is limited. Therefore, researchers can select instruments appropriate to their purpose, adapt them to the local context, and integrate TIC evaluation with patient outcomes and healthcare worker well-being. Strengthening instruments that healthcare workers, particularly nurses, can use to implement trauma prevention in natural disaster areas, such as Indonesia, is needed.

Limitations

This systematic review has several important limitations. This study included only published articles in English, potentially overlooking relevant instruments from local or unpublished sources. The predictive validity and long-term evaluation of these instruments in disaster contexts have also been understudied.

CONCLUSION

Based on the review of nine Trauma-Informed Care (TIC) instruments, nurses are encouraged to actively integrate these tools into different phases of disaster management to enhance patient care and support healthcare teams. During the initial phase of a disaster, instruments such as the ARTIC and TIC-PAT can be used to quickly assess attitudes, competencies, and readiness of healthcare workers in delivering trauma-informed care. As the response and rehabilitation phases progress, tools like the TICO Meter and OTRA should be applied to evaluate and strengthen organizational culture, resilience, and systemic readiness. In the recovery phase, the TIP Scale can be incorporated into nursing interventions to empower survivors and promote healing. To effectively utilize these instruments, nurses require training in trauma-informed principles and assessment methods, collaboration with interdisciplinary teams, and a commitment to applying the findings from these assessments in clinical decision-making. By systematically using these tools, nurses can ensure that trauma-informed care becomes an integral part of practice, leading to more compassionate, safe, and resilient healthcare services, especially in disaster-prone settings.

Future research should expand its scope to include non-English publications and locally developed instruments to provide a more comprehensive understanding of trauma-informed care implementation in disaster settings. Longitudinal studies are needed to assess the predictive validity and long-term effectiveness of TIC instruments across different phases of disaster management. Additionally, future studies should focus on cultural adaptation and psychometric validation of TIC instruments across diverse healthcare systems and disaster contexts, particularly in low- and middle-income countries. The integration of TIC assessment tools into disaster preparedness policies and nursing education and training programs represents an important area for further investigation to enhance the quality and sustainability of trauma-informed nursing care.

Conflict of Interest

The authors declare that they have no competing interests.

ACKNOWLEDGEMENT

The authors gratefully acknowledge the academic support and scholarly guidance provided by the lecturers of the Doctoral Nursing Program, Faculty of Nursing, Universitas Indonesia, whose expertise and stimulating academic environment have substantially contributed to the completion of this study. The authors also express their sincere appreciation to Mrs. Karina Megasari Winahyu for her valuable supervision and intellectual guidance in developing the analytical framework, policy brief, and systematic review. The constructive feedback, professional insights, and continuous support played an essential role in strengthening the conceptual development and successful completion of this research.

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