JHWCR

Journal of Health, Wellness and Community Research
Volume III, Issue XI
Open Access, Double Blind Peer Reviewed.
Web: https://jhwcr.com, ISSN: 3007-0570
https://doi.org/10.61919/6dr5t897

Research Methodology

Applying the Knowledge-to-Action Framework to Close the Research-Practice Divide: A Facilitative Discourse of Knowledge Generation

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Author Contributions: Conceptualization: HE, AJP, SI, KSM; Design: HE, AJP, SI, KSM; Drafting: HE; Review and Editing: HE, AJP, KSM
Article History | Received: 2025-08-11 | Accepted: 2025-08-24
No conflicts declared; ethics approved; consent obtained; no funding received.

ABSTRACT

The persistent disconnect between research and practice in nursing education hinders improvement in educational and health outcomes. This continuous divide calls for a systematic theory-informed approach to move research into practice. A robust understanding of innovative research methodologies and frameworks for knowledge synthesis and application into practice is needed. Guided by knowledge translation research through the Knowledge-to-Action (KTA) Framework and theory generation process, the methodology to develop scientific knowledge, using the example of a resilience-focused education approach development for undergraduate nursing students, is presented. This paper offers a robust and replicable process for researchers to develop contextually relevant, evidence-informed interventions, thereby fostering research-informed practice. This methodological discourse highlights the potential of the KTA framework to drive educational innovation, required for transformative education in nursing and beyond.
Keywords: Knowledge-to-Action Framework; Knowledge Translation; Nursing Education; Resilience; Research–Practice Gap; Methodological Discourse.

INTRODUCTION

Globally, healthcare research faces a persistent lag between knowledge development and its use in improving healthcare outcomes (1,2). Specifically in nursing, despite widespread acknowledgement of the evidence-based practice, research findings are inconsistently applied in clinical and educational settings (3,4). Several studies have identified key barriers to research utilization, including insufficient knowledge and skills, time constraints, lack of institutional support, and organizational culture resistance to change (5,6). The problem is complemented by the rapid expansion of scientific literature, making it difficult for healthcare professionals to remain abreast of the latest evidence (7). This continuous disconnect between research and its application calls for a systematic theory-informed approach to move research into practice. Therefore, Knowledge Translation (KT) addresses this need by focusing on the dynamic and iterative process of applying empirical knowledge through various research-based activities, including knowledge transfer, exchange, dissemination, and application (8,9). The Knowledge-to-Action (KTA) framework is a comprehensive model of KT that provides a structured approach to guide the KT process through interconnected steps (4,9,10).

The KTA framework has been successfully employed in disciplines such as rehabilitation, cardiology, and public health, demonstrating its utility in translating evidence into practice across diverse healthcare contexts. For instance, in the field of rehabilitation, the KTA framework has been used to increase the use of best practices in managing stroke rehabilitation among patients with poststroke impairments (11). In cardiology, the framework has guided the implementation of national guidelines for hypertension management, ensuring evidence-based interventions, and has been adopted and sustained in local clinical settings (12). In public health, it has been used to develop and evaluate a health-promotion school intervention, demonstrating significant improvement in students' knowledge and behaviour regarding chronic disease prevention (13). These examples highlight the framework's versatility and use in bridging the gap between research and practice across various health disciplines. Given the complexity and rapidly evolving nature of nursing education, adopting a systematic framework like KTA offers significant potential for effectively translating research findings into sustainable interventions (3).

Through its structured process, the KTA framework holds particular promise for transforming nursing education by enabling nurse educators to embed research evidence into nursing curricula (4,6). Moreover, the use of the framework in planning and conducting nursing research aligns directly with the directives of national policies in Pakistan, addressing the need for quality education in higher education institutions (14,15). Recently, the Higher Education Commission (HEC) of Pakistan has introduced the "Pakistan Precepts, Standards, and Guidelines for Quality Assurance" to address gaps in the country's education sector (14). This policy framework emphasizes the importance

of stakeholder engagement, a student-centred approach, and proactive educational strategies to improve students' learning experience (15). On a global scale, international organizations like the World Health Organization (WHO) also emphasize the need for resilience-building efforts at individual, community, and institutional levels (16). Additionally, Sustainable Development Goal 4 (SDG-4) promotes inclusive, equitable education, advocating for resilience as essential for lifelong learning and well-being (17). These national and international educational guidelines require nurse educators to generate, synthesize, translate, apply, and disseminate knowledge to improve and transform nursing education, which aligns directly with the KT activities (9).

BACKGROUND

The complex and demanding nature of contemporary healthcare environments necessitates that nursing graduates not only demonstrate clinical competence but also possess the skills to navigate complex and challenging situations (18,19). This comprehensive preparedness encompassing personal, professional, and leadership development is imperative for holistic nursing education (20). Within this broader developmental context, resilience is defined as the capacity to adapt to adversities and challenging environments and has emerged as a critical determinant of student success and well-being in nursing education (21,22). Moreover, the need to integrate resilience-focused education in nursing curricula is supported by growing evidence about psychosocial, emotional, and academic challenges encountered by nursing students, hindering their academic progress and well-being (23,24). Some of the leading challenges in nursing education are prolonged study hours, high-stakes clinical placements in unfamiliar environments, and the transition to university life (18,19), supporting the need to integrate resilience-focused education in nursing curricula (25).

Over the decades of research, resilience has evolved as a significant empirical concept in nursing, defined as a capacity to adapt positively to stress, adversity, and complex challenges inherent in healthcare environments (21,22). Research has increasingly documented resilience as a key predictor of nursing students' academic success, psychological well-being, and readiness to cope with the demanding transition into professional practice (18,19). However, while resilience is well established in empirical literature, its practical application within nursing education remains inconsistent and often theoretical rather than integrated into educational curricula (26–28). While various resilience-building educational interventions have been developed, many lack consistency in design, fail to address contextual needs, and are often not sustained in practice, leading to variability in outcomes across educational settings (4, 26). Furthermore, while the imperative to generate, synthesize, translate, apply, and disseminate knowledge into nursing to improve and transform healthcare is broadly acknowledged (15,20), a significant gap persists in contextually relevant and sustainable resilience-building interventions in nursing education (28). This persistent gap between understanding the resilience conceptually and effectively embedding it into practice underscores the need for systematic processes that translate empirical knowledge into actionable interventions.

The KTA framework, as a comprehensive KT model, provides a systematic and iterative pathway to guide the creation, adaptation, and evaluation of a resilience-focused educational approach to practice by translating empirical findings into actionable educational strategies that are contextually relevant and sustainable (8,9). Applying KT principles ensures that resilience is not merely an abstract concept but becomes a practical component of nursing education, equipping students with the skills and resources necessary to navigate the challenges and transition to professional practice successfully. In this way, KT plays an essential role in operationalizing resilience-focused education, transforming empirical findings into sustainable improvements in nursing curricula and educational outcomes (3,9).

Aligned with the practical application of the KTA framework in nursing education research, this paper aims to answer the overarching question: How can the KTA framework be used as a methodological tool to guide the generation and implementation of knowledge into nursing educational practice? The objectives listed below pertain specifically to the exemplary research project on resilience-focused education, which is used in this paper to demonstrate how the KTA framework can be operationalized. These objectives are not the first objectives of this discussion paper itself but serve to illustrate the methodological application of the framework in practice. The following objectives guided this exemplary research to:

1. Synthesize the existing evidence on resilience-focused educational programs currently implemented during undergraduate nursing education.
2. Explore the diverse stakeholders' experiences and perspectives on resilience-focused education in nursing.
3. Generate and validate a contextually relevant resilience-focused education approach.
4. Implement and evaluate the resilience-focused education approach to sustain it in routine nursing education practice.

Thus, being empirical and applied in nature, this research used the KTA framework as an appropriate tool for planning the research project to develop a resilience-focused educational approach to enhance the academic success and well-being of undergraduate nursing students (see Figure 1).

STRUCTURE OF THE KTA FRAMEWORK

Developed by Graham and colleagues in 2006, after a review of 60 planned action theories to structure knowledge translation by the researchers and clinicians (9). The Canadian Institute of Health Research (CIHR) adopted this framework as a model for knowledge translation in healthcare disciplines (10). The KTA framework consists of two phases: the first is knowledge creation, where knowledge shifts through a funnel to be tailored for the end users' needs, and the second is the Action Cycle, which further entails seven steps outlining a dynamic, iterative, and cyclic process of applying knowledge by the knowledge users (29). Importantly, these phases are complex, dynamic, and interconnected, which can be undertaken sequentially or simultaneously based on the nature of the research project (12). Additionally, the stakeholders' engagement is considered the core element of the framework (30).

Knowledge Creation

The knowledge creation phase consists of three steps to identify relevant knowledge through knowledge inquiry (first-generation knowledge), synthesizing existing knowledge (second-generation knowledge), and tailoring the knowledge to the product and tool (third-generation knowledge) to make it useful for the stakeholders (9). This phase is used to develop evidence-based tools and products, such as interventions, programs, policies, and recommendations. Mainly, the knowledge creation process is adopted in all product development methodologies; however, some are more rigorous than others (31).

The Action Cycle

The action cycle is the process through which knowledge is generated, implemented, monitored, evaluated, and sustained in practice. The multi-stage phase focuses on systematic integration of evidence-based knowledge into practice (30). The action cycle generally starts with problem identification, in which nurses can define a problem from existing evidence for recommended practice, review of literature, or quality improvement methods, and determine the knowledge-practice gap. At this stage, the stakeholder engagement is defined, and the process starts with either adopting, synthesizing, or developing the evidence for practice. Based on the research context, the researcher can move into the funnel to tailor the knowledge and start with the action phase to implement it into practice. After selecting knowledge in stage one, the second stage is adaptation to the local context by engaging the stakeholders in implementing, reviewing, and adopting knowledge. This stage is crucial as knowledge users decide about the knowledge value, usefulness, and appropriateness to their local context. The next stage is assessment of barriers/facilitators to knowledge use, which highlights the need to assess potential barriers to the uptake of knowledge. Importantly, such barriers are addressed or diminished through the implementation strategies. Likewise, the elements that facilitate knowledge use in the practical setting are also identified. The next stage is to select, tailor, and implement interventions, which entails applying knowledge among stakeholders. It again entails the assessment of barriers and facilitators to knowledge use. Following the launch of the intervention, the next stage is monitoring the knowledge use in three ways: The first is the conceptual use of knowledge, which consists of a change in understanding and attitude of the knowledge users. The second is practical use that shows behaviour change, while the third is strategic use that describes the use of knowledge to attain a specific goal. Monitoring the use of knowledge is also important to assess the sufficiency of the intervention or determine the need for more knowledge to achieve desired outcomes. The next stage is evaluating outcomes, which determines the impact of using knowledge in making a difference in health and system outcomes. The last stage is about sustaining the knowledge use through the feedback loops, and efforts are made to overcome the challenges to put the knowledge into practice (9,29,30).

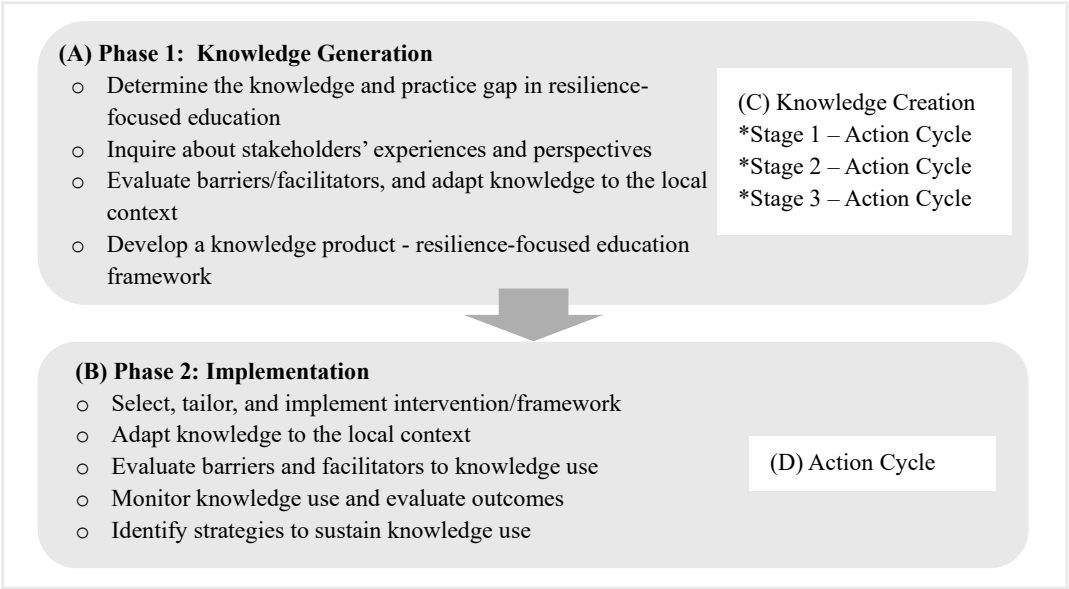

Figure 1: KTA framework and structure of the research project. (A) Phase 1 of the research project. (B) Phase 2 of the research project. (C) Knowledge creation phase of the KTA framework. (D) Action cycle of the KTA framework. [*] Stages of the action cycle of the KTA framework considered in phase 1. [o] Actions taken in the research project aligned with the components and steps of the KTA Framework.

METHODOLOGY

This research employed the theory generation process as a multi-method research approach integrating a systematic review, a qualitative descriptive study, and participatory educational research designs over two distinct phases of the project, guided by the KTA framework. The theory generation process systematically develops new theoretical frameworks that can guide practice, inform policy, and contribute to scientific literature (32). In this research, the approach was used to ascertain gaps in existing practices, create and structure empirical knowledge into a framework, and validate and apply it in practice to guide resilience-focused education in nursing.

The process is guided by five dimensions of empirical knowing (32). (see Table 1). First, the critical questioning dimension initiates the knowledge inquiry by asking fundamental questions such as "what is this phenomenon?" and "how does it work?" and addresses these questions through formal research methodologies. Second, the creative processes dimension involves conceptualizing and structuring empirical knowledge to generate tentative answers and theoretical propositions. Third, the formal expression dimension focuses on

organizing empirical knowledge into coherent forms such as concepts, models, and frameworks that can be critically examined, tested, and potentially generalized. Fourth, the authentication processes dimension ensures the scientific rigor of the knowledge generated, involving systematic methods of confirmation and validation. The authentication process addresses the key evaluation questions, including: How clear is this knowledge? How simple is it? How generalizable and accessible is it? How significant is it for practice? Finally, the integrated expression of knowledge in the practice dimension emphasizes translating theoretical knowledge into practical application, ensuring that the knowledge produced is meaningful, applicable, and capable of improving outcomes. This dimension also supports revisiting and refining theoretical frameworks based on practical implementation results.

The theory generation process accommodates diverse methodological choices across both quantitative and qualitative paradigms, allowing for comprehensive data collection and analysis techniques (32). Moreover, the integration of multiple designs aligns with the KTA framework's iterative process, enabling systematic evidence synthesis, stakeholder engagement, and practical application of knowledge in practice (9). This multi-method approach ensures that the development of educational intervention is both evidence-based and contextually relevant. Therefore, in this exemplary research project, the methodology combined systematic review, exploratory descriptive qualitative inquiry, and participatory educational research to facilitate both the development and practical application of theoretical knowledge.

Integrating the theory generation process as a multi method research approach, with the systematic steps of the KTA framework, this exemplary research was planned in two phases to achieve the research objectives (see Table .1). However, the KTA framework was applied holistically, with several stages conducted simultaneously, reflecting its flexibility and iterative nature and ensuring a robust, theory-driven pathway from knowledge generation to practical implementation in resilience-focused nursing education.

Table 1: Research Methodology

Phase	KTA Stages	Theory Generation Dimensions	Research Design	Participants & Sample	Data Collection	Data Analysis
Phase 1: Knowledge Generation	Knowledge Creation: Inquiry → Synthesis → Knowledge Products Action Cycle: Identify problem; Select knowledge; Adapt knowledge to local context	Critical Questioning	Systematic Review & Meta-analysis	Published literature: RCTs, quasi-experimental, and mixed-method studies	Database search; inclusion/exclusion criteria applied	Evidence synthesis & meta-analysis of resilience-focused interventions
		Critical Questioning; Creative Processes	Exploratory Descriptive Qualitative Study	Nursing students; Nurse Educators; Opinion Leaders (n = 38)	Semi-structured interviews	Thematic analysis
Phase 2: Implementation	Action Cycle: Assess barriers/facilitators; Select & tailor interventions; Monitor knowledge use; Evaluate outcomes; Sustain practice	Creative Processes; Formal Expression; Authentication; Integration in Practice	Participatory Educational Research (PER)	Nurse educators, Nursing Students (n = 34)	Educational workshops	Content analysis, Confirmation, and validation

RESEARCH DESIGNS

This exemplary multi-method research employed three distinct study designs to comprehensively explore and translate resilience-focused education into potential practice. Firstly, a systematic review and meta-analysis were performed to synthesize existing evidence on resilience-focused educational interventions for undergraduate nursing students. Secondly, a descriptive qualitative study design involving semi-structured interviews with diverse stakeholders was employed to generate context-specific empirical knowledge and conceptualize resilience-focused education. Thirdly, Participatory Educational Research (PER) was conducted as a qualitative research design to collaboratively generate, validate, implement, and evaluate the resilience-focused education approach for undergraduate nursing students. This multi-method design supported methodological rigor and provided a robust foundation for translating theoretical knowledge into educational practice. These study designs were sequentially carried out in two distinct research phases as presented below:

Phase 1: Knowledge Generation

This research phase aimed to generate foundational knowledge to inform the development of a resilience-focused education approach for undergraduate nursing students. It corresponded to the initial stage of the KTA framework, which is "*identify the problem and determine the know/do gap*," which serves as the starting point for the knowledge translation process. Additionally, it was aligned with stages 1 and 2 of the KTA action cycle, focusing on assessing barriers and facilitators to implement resilience-focused education and adapting knowledge to the local context (see Figure 1). To serve this purpose, two distinct research designs: a systematic review and meta-analysis, and an exploratory descriptive qualitative study, were employed in this phase:

1. Systematic Review and Meta-analysis

First, a systematic review and meta-analysis were conducted to synthesize the existing evidence regarding resilience-focused educational programs in undergraduate nursing education. The findings from this review indicated that while such programs can positively influence resilience, their effects are often delayed, highlighting the need for more comprehensive and contextually relevant interventions. The review also supported the in-depth exploration of the phenomenon to develop an inclusive, multi-dimensional approach for resilience-focused education in nursing. The details of the review methodology, data analysis, and results have been published in a separate research

paper (28). This review established the rationale for further empirical inquiry and guided the progression through the knowledge creation funnel of the KTA framework.

2. Exploratory Descriptive Qualitative Study

Following the systematic review and meta-analysis, an exploratory descriptive qualitative study design was employed to conduct semi-structured interviews with diverse stakeholders, including nursing students, nurse educators, and opinion leaders in nursing education. The goal of this qualitative study was twofold: (a) to engage stakeholders in providing an in-depth understanding of their experiences and perspectives on resilience-focused education in nursing, and (b) to conceptualize resilience-focused education as a tailored knowledge product that addresses the specific contextual needs of nursing education.

Parallel to the KTA framework, the study was also guided by the theory generation process, particularly the dimensions of critical questioning and creative processes (32). These dimensions informed the development of the interview guides, qualitative data analysis, and the identification of the concepts to develop a resilience-focused education approach. The detailed procedure for data collection, transcription, coding process, and thematic analysis lies outside the scope of this discussion paper and will be reported in a subsequent research article focusing specifically on the empirical findings.

Phase 2: Implementation

Phase 2 of this exemplary research aimed to generate, validate, implement, and evaluate the resilience-focused education approach for undergraduate nursing students, building on the concepts explored in Phase 1. This phase was aligned with subsequent stages of the KTA action cycle, including adapting knowledge to the local context, assessing potential barriers and facilitators to knowledge use, and developing strategies to support future implementation and sustainability (See Figure 1). Grounded on the theory generation process, phase 2 was also guided by the creative process, formal expression, confirmation, validation, and integrated expression in practice dimensions (32) (See Table 1). To serve this purpose, participatory educational research was a third study design employed in this phase:

3. Participative Educational Research (PER) Design

In this study, participants were actively involved as co-researchers through educational workshops to explore, clarify, and refine the meaning, contextual relevance, and practical feasibility of the emerged concepts for resilience-focused education in nursing (33,35). This collaborative approach was designed to facilitate the adaptation of theoretical knowledge to the local context and to identify practical strategies for integrating the resilience-focused education approach into practice. Following the validation of this educational approach, participants were engaged in preliminary implementation activities. Barriers and facilitators to knowledge were documented during the workshops, informing any necessary refinements to the approach and its implementation strategies.

Monitoring of knowledge use and evaluation of initial outcomes were carried out through participants' reflections, capturing their insights, experiences, and perceptions regarding the applicability of the resilience-focused education approach. Based on these findings, recommendations were developed for potential large-scale implementation and for strategies to sustain the use of the resilience-focused education approach in routine nursing education practice. A detailed account of the PER process, including specific workshop activities, stakeholders' contributions, and empirical findings, lies beyond the scope of this discussion paper and will be reported in a separate research publication.

SAMPLE AND SAMPLING

The research participants were recruited from public and private sector nursing institutes in Islamabad, Pakistan, offering a four-year Bachelor of Science in Nursing (BSN) program. Participants were recruited through purposive sampling, with invitation distribution via institutional networks and personal contact in the nursing colleges. To engage diverse stakeholders in developing a comprehensive, multi-dimensional resilience-focused education approach, the target population included nursing students, nurse educators, and opinion leaders from the nursing education context.

Phase 1

For the exploratory descriptive qualitative study in the first phase, nursing students, nurse educators, and opinion leaders were purposively selected from public and private sector institutions. Additionally, nurse educators and opinion leaders involved in nursing education and training were purposively selected from both the study institutes. For the recruitment of nursing students across all four years of the BSN program, a selection criterion of high-performing and low-performing male and female students was followed. In this selection criterion, the high performers were defined as those with a cumulative grade point average (CGPA) of 3.0 or above, while low performers had a CGPA of 2.0 or below in their recent examination. The sample size was determined following the principle of data saturation to ensure sufficient depth and diversity of perspectives (36). Thus, data saturation was achieved with a sample consisting of subsets of 32 nursing students, 4 nurse educators, and 2 opinion leaders, bringing a total sample of (n=38) participants.

Phase 2

Subsequently, in phase 2, this exemplary research employed a PER design in which the nurse educators holding a master's degree in nursing, experienced in teaching nursing, basic sciences, and clinical subjects, and involved in curriculum planning and implementation, as well as nursing students from all four years of the BSN program (following the high and low performing selection criteria) purposively selected from the study settings. The sample size for students' workshops was 22 students in each workshop, and for educators' workshops

was 12 educators in each workshop, bringing the total sample to (n=34) participants. This sample for this phase was determined based on feasibility considerations and the need for comprehensive stakeholder engagement consistent with qualitative research methodology (36).

ETHICS

The study received approval from the Institutional Review Board and Ethics Committee of Shifa International Hospital (Approval No. 509-24). All participants provided informed consent; confidentiality and voluntary participation were ensured throughout data collection and PER activities.

RIGOR

Rigor in this research was ensured across all the study designs by adopting related guidelines. For the SR and meta-analysis PRISMA guidelines, JBI quality appraisal tools, and PROSPERO registration were considered to ensure that the review adheres to the reporting standards (28). For the EDQ and PER, the trustworthiness criterion of Lincoln & Guba (1985) was taken into account to ensure credibility, transferability, dependability, confirmability, and authenticity of the findings. Additionally, the multi-method research methodology also added to the rigor of this research (37). The use of the KTA framework and the theory generation process complemented each other and allowed data triangulation to develop an inclusive, multi-dimensional resilience-focused education approach.

DISCUSSION

This paper illustrates how the KTA framework can serve as a structured and systematic approach for planning and conducting knowledge translation research in nursing education. It consists of an iterative cycle, encompassing problem identification, knowledge synthesis, adaptation to local context, and planning for implementation, that provides an effective roadmap for bridging the persistent gap between research and practice in nursing education (9). In the context of this exemplar research, the application of the KTA framework supported the development of a tailored educational approach that considers the unique challenges and contextual factors present in nursing education. Additionally, through its emphasis on stakeholder engagement and contextual adaptation, the KTA framework aligns well with participatory research approaches, enabling researchers and educators to co-create interventions that are more likely to be relevant, accepted, and sustainable (8,9,33,34). This collaborative dimension is particularly valuable in nursing education, where diverse perspectives from students, educators, and opinion leaders are critical for designing interventions that address practical realities and promote meaningful change.

Moreover, integrating the KTA framework with the theory generation process provides a comprehensive methodological approach for translating theoretical concepts into evidence-informed solutions with broader applicability and potential for sustainable practice across educational settings. Although empirical findings from this exemplar research are not presented in this discussion paper, the methodological insights outlined here illustrate how the KTA framework can effectively guide the systematic planning and conduct of knowledge translation research in nursing education. Further work will report on the empirical findings of the research, including stakeholder interviews and participatory educational research outcomes on designing a resilience-focused education approach, contributing further evidence to support the use of KTA in nursing education contexts.

The application of the KTA framework has been successfully demonstrated in numerous original research contexts, guiding systematic approaches to translate evidence into practice across healthcare disciplines (3,11–13) These studies similarly illustrate how KTA's iterative processes, stakeholders' engagement, and context adaptation can inform rigorous research planning and the development of tailored interventions in nursing and beyond. Thus, aligned with previous research in other healthcare disciplines, this facilitative discourse on knowledge generation offers a replicable model for future research and policy initiatives to strengthen theory-driven knowledge generation and evidence-informed nursing education in similar contexts. Moreover, the discourse advances the solution to the growing global concern of delayed knowledge uptake by knowledge users to improve healthcare outcomes. Nurses can use this process as an example to structure their research for knowledge development and implementation to achieve desired outcomes in academic and clinical settings.

LIMITATIONS

Despite the methodological contribution of this discussion paper, there are some limitations to be reported. As a discussion and methodology paper, the empirical findings are not presented from the research phases, which limits the ability to provide outcome-based conclusions. However, the purpose of this paper is to present the facilitative discourse of the KTA framework for planning and conducting knowledge translational research. There may also be inherent limitations related to potential bias in the stakeholders' engagement for the exemplary research context described.

RECOMMENDATIONS

1. Educators need to develop resilience-building strategies using a holistic approach to address the diverse personal and professional development needs of students, preparing them to navigate complex and challenging healthcare environments.
2. Nursing researchers need to strengthen their capacity to systematically generate, adopt, and implement evidence-informed interventions for resilience-building to enhance educational outcomes and improve healthcare delivery.
3. This paper provides a methodological foundation for translating theoretical knowledge into practice through the structured application of the KTA framework, serving as a blueprint for researchers, educators, and institutes committed to integrating theory-informed approaches into nursing education and beyond.

CONCLUSION

By applying the KTA framework, nurse educators and leaders can develop nursing curricula that directly address students' educational needs, aligned with the HEC guidelines for quality assurance in higher education institutions in Pakistan. This paper offers a scalable model for developing contextually relevant educational innovations that can be adapted across diverse nursing and health professions educational settings to enhance academic outcomes.

Acknowledgements

Gratitude to the Boitekanelo College for granting the main supervisor the time to oversee this research. Thank you to the management of Islamabad Nursing College (INC) and Islamabad Medical and Dental College (IM&DC) for the support and facilitation in this research.

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