# Nursing Students As Workforce Extenders: An Evidence-Based-Pandemic Education-Innovation: Systematic Review

## Jawaher Abdullah Bin Jumah, PhD, RN

*Assistant Professor Nursing Administration & Education Department; College of Nursing; King Saud University; Riyadh 11451; Saudi Arabia jjumah@ksu.du.sa ORCID ID "0000-0002-5130-275x"*

| Keywords | Abstract |
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| Nursing students, workforce extenders, education innovation, COVID-19 pandemic, learning outcomes, clinical trials, evidence-based practice. | **Background:** The recent COVID-19 pandemic severely damaged healthcare systems worldwide, exposing the world's emergency preparedness and response capacity. The nursing workforce has faced increased new challenges recently, particularly in influent nations. The global shortage of the nursing workforce emphasizes the urgent need to develop a flexible environment to rebuild and support exhausted human resources. |
| | **Aims:** This systematic review aimed to discover the outcomes associated with deploying nursing students as workforce eextenders with particular attention to their perceived benefits and losses. |
| | **Methods:** The principal researcher conducted an online search on CINAHL, PubMed, MEDLINE, Google Scholar, and the Cochrane Library to retrieve relevant studies that satisfied the predetermined eligibility criteria, using keywords and MeSH terms. |
| | **Results:** A total of 1,160 participants from 52 studies published over the past five years and originating from 21 different countries were included in the review. Most of the studies suggested that nursing interventions resulted in improved student learning outcomes as knowledge, skills, satisfaction, critical thinking, and self-confidence. Academic-practice partnership programs are innovative interventions, especially during pandemics when the shortage of nursing staff is exacerbated. The removal of certain barriers and clinical training sessions becomes valuable for preparing nursing students as part of the nursing workforce. |
| | **Linking Evidence to Action**<br>Academic and professional administration in the nursing field can be crucial to nursing students' successful attainment of EBP competency internally and nationally. |

## Introduction

Nurses are an essential healthcare workforce worldwide that plays a critical role in delivering quality healthcare services and improving health outcomes. Therefore, the deployment of enough nurses is crucial for growing a sustainable nursing workforce and strengthening the healthcare industry (Tamata & Mohammadnezhad, 2023; Casafont, et al., 2021). However, the healthcare industry is facing a continually growing shortage of nurses worldwide. Recently, the coronavirus disease 2019 (COVID-19) pandemic potentially exacerbated this shortage, exhausting the nursing workforce (Pourmand et al. 2023; Adhikari & Smith, 2023). According to the World Health Organization (WHO) (2020), approximately 27.9 million nurses constitute the current nursing workforce, while 5.9 million nurses constitute the current nursing shortage (World Health Organization, 2020).

In addition, WHO reported that is impossible to sustain a functional healthcare system without having a sufficiently trained healthcare workforce as evidence-based pracrice (Adhikari & Smith, 2023; Collado-Boira, Ruiz-Palomino, Salas-Media, Folch-Ayora, Muriach & Baliño, 2020). COVID0-19 has severely damaged healthcare systems worldwide, exposing the world's emergency preparedness and

response capacity (World Health Organization, 2020; Intinarelli, Wagner, Burgel, Andersen, & Gilliss, 2021). Currently, as the healthcare system has recovered from the COVID-19 pandemic, the nursing workforce has increased—a new challenge, especially for affluent nations (Alshutwi, 2021; Aziz, A. A. H. H. A., Abdul-Mumin, & Rahman, 2021) In this context, the International Council of Nursing Nurses (ICN) has highlighted the shortage of the nursing workforce globally while stressing developing a flexible environment to rebuild exhausted human resources (International Council of Nurses, 2023; Tamata & Mohammadnezhad, 2023).

Collaborative Learning in Practice (CLIP) is the most organized practice-oriented coaching model that is usually utilized in different healthcare organizations in which nursing students are allowed to work in general practice nursing (GPN) setups under the supervision of registered nursing staff (Williamson, Kane, Evans, Attrill, Cook, & Nash, 2023; Hahn-Schroeder, H., Honig, Smith, Chin, & Frazier, 2022).The CLIP model enhances clinical capacity, improves patient access, helps students feel as though they are a part of a team, and shares the burden of the GPN. This is a safe and feasible model that allows students to learn under peer support and to access the opportunity for interpersonal learning from their colleagues (Williamson et al. 2023). Branson et al. (2023) established an innovative academic-practice partnership for nursing students to fulfill the needs of clinical experience and to support the nursing workforce deployed at community-based hospitals. The authors reported that this innovative model was safe and feasible because the nursing students achieved their academic objectives without any extra burden on the nursing staff (Branson, LaMonica-Way, Krawtz, & Djukic, 2023; AlOmar, AlShamlan, AlAmer, Aldulijan, AlMuhaidib, Almukhadhib, & Al Shammari, 2021; Kulshreshtha, Bahurupi, Kalyani, Hemanthkumar, Varghese, Dhar, & Rao, 2023). Hence, if nursing students are allowed to work under professional nurses to meet their clinical objectives, they can support the nursing workforce in addition to collaborative learning. This systematic review aimed to review the outcomes of nursing students as workforce extenders, focusing on the advantages and limitations of this collaborative learning model (Williamson, et al., 2023).

**Aims**
The the primary aim of this systematic review was to identify the outcomes of nursing students as workforce extenders in terms of perceived benefits and losses.

**Methods**
A systematic review was conducted to address a research question framed using the PICO format: among nursing students in academia settings, what is the level of nursing students as workforce extenders? Further, is there an association between academic-practice innovation and student learning outcomes? Notably, this systematic review did not include a control or comparison group.
A comprehensive search of electronic databases applying the following key databases: CINAHL, PubMed, Google Scholar, and the Cochrane Library. This comprehensive search strategy was employed to identify studies included in this systematic review by applying specific keywords in accordance with the inclusion and exclusion criteria.

**Study Eligibility**
Inclusion and exclusion criteria were used to select the reviewed studies. The inclusion criteria were (a) studies published from January 01, 2019, to December 31, 2023; (b) studies based on all study designs; (c) original articles; (d) peer reviews; (d) published in the English language; and (d) studies on nursing students as workforce extenders or innovative models of academic-practice partnerships or on the willingness of nursing students to take care of patients during the pandemic. The exclusion criteria were (a) studies published before January 2019 or after December 2023, (b) studies other than original research, (c) studies not involving nursing students, (d) studies in languages other than English, studies involving nursing students other than workforce extenders or innovative models of academic-practice partnerships, and (d) studies not involving nursing students or having missing data.

**Study Identification**
To ensure the comprehensive of relevant literature, the principal researcher employed a structured and methodologically sound electronic search strategy across four major databases: CINAHL (incremental

index to Nursing and Allied Health Literature), PubMed, MEDLINE, Google Scholar, and the Cochrane Library. The search amide to identify studies that viewed the involvement of nursing students as workforce extenders, their engagement in academic-practice as pandemic. The search was restricted to peer-reviewed primary search articles in English between January 1, 2019, and December 31, 2023, considered the later-day academic developments, mostly in the context of the COVID-19 pandemic.

A comprehensive synthesis of free-text keywords and Medical Subject Headings MeSH terms were used to refine specificity and sensitivity of retrieval studies   The following terms were included "nursing students", "education", "innovation", "workforce extenders or "workforce expanders", "collaborative learning in practice", "academic-practice partnership", "willingness". There were associated using the Boolean operator AND and OR to structure accurate search combinations, for instance:   ("nursing students" AND "education" AND "innovation"). Moreover, ("nursing students" AND "workforce extenders" OR "workforce expanders"), and ("collaborative learning in  practice" AND "academic-practice partnership"). Specialized filtering techniques were utilized to restrict results to original studies, involving , to clinical study, controlled clinical trials, evaluation studies, multicenter studies, and observational studies.  Research studies were excluded if they were not original study, concentrated on nursing students, did not reference to the selected themes, for instance academic-practice models or workforce readiness.

All data were screened according to the PRISMA 2020 guidelines (Page, et. al., 2021) to ensure transparency and consistency. Moreover, the reference lists of the included studies were manually reviewed to define additional relevant articles that may not have been captured in the initial database search. This process illustrated a rigorous and systematic path to identify relevant research studies, providing a strong foundation for high quality data synthesis and critical appraisal utilizing the Critical Appraisal Skills Programme (CASP, 2018 and Melnyk and Fineout-Overholt's levels of evidence (Melnyk & Fineout-Overholt, 2019).

**Study Selection**
Based on the inclusion criteria, 817 articles were independently identified by a principal
 searcher. Duplicate articles were excluded from the review, leaving 389 studies. A third search was conducted for consensus if any discrepancy occurred. A total of 1160 participants from 52 studies were included in this systematic review utilizing the inclusion criteria (Figure 1).

**Data Extraction**
The principal researcher created a summary table of all the included studies for the appraisal and synthesis of findings (Table 1). The summary table included the study characteristics, such as authors, year of publication, purpose, research design, sampling strategy, sample size, data collection method, intervention, major results, and level of evidence. The principle researcher used Melnyk and Fineout-Overholt's levels of evidence to rank the studies. Then, the Critical Appraisal Skills Programme (CASP) guidelines were applied to appraise the studies for bias.

**Data Synthesis**
The CASP guidelines were applied to appraise the studies for bias. The studies were categorized into high or low levels of evidence using Melnyk and Fineout-Overholt's levels of evidence.
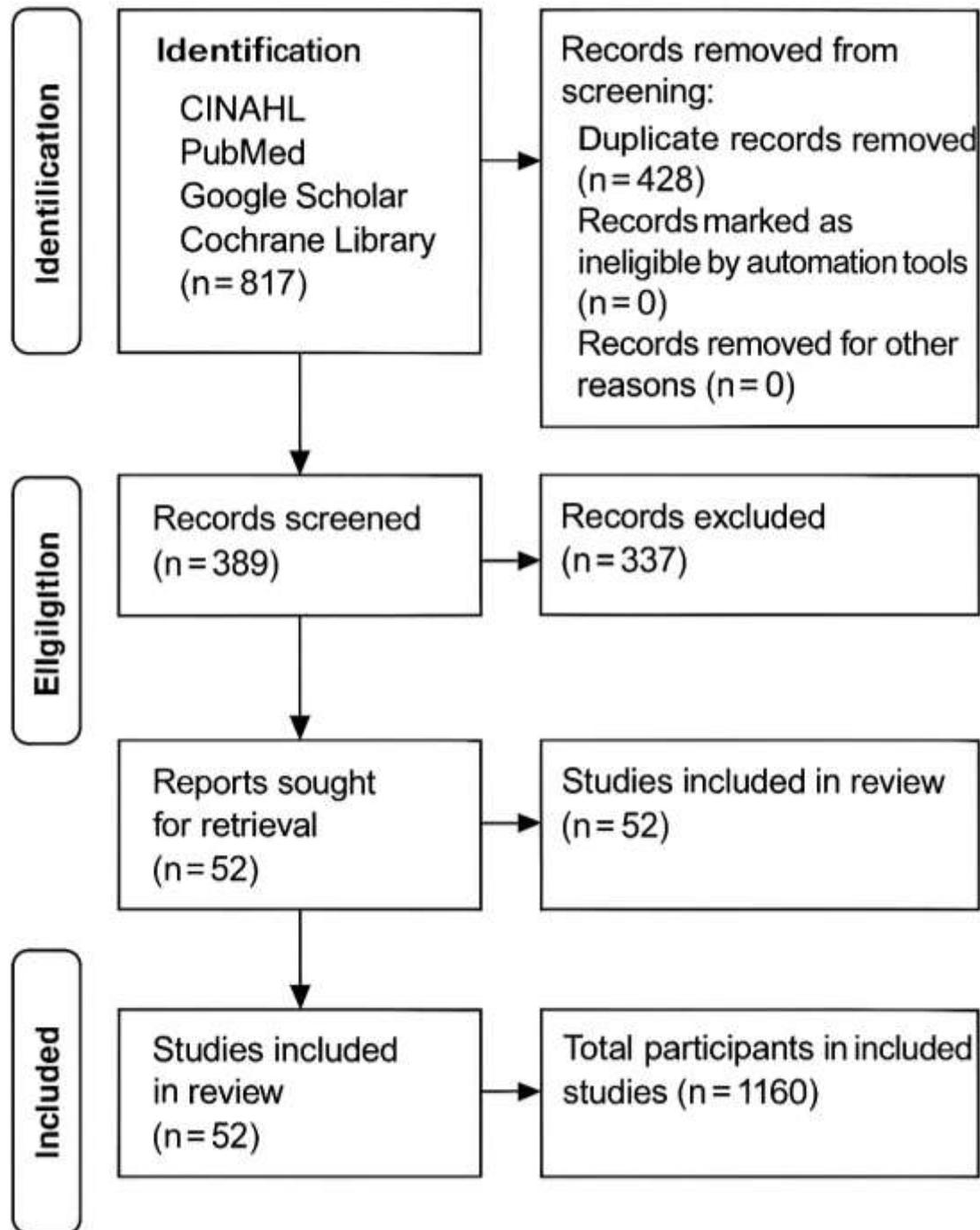
**Figure 1:** PRISMA Flow Diagram

**Results**

A thematic synthesis was conducted to integrate qualitative and mixed-methods findings across the 52 studies included in this systematic review. The review included studies from 21 countries, representing diverse geographical, cultural and academic-practice contexts. Participants (n = 1160) were predominantly nursing students across various stages of academic, involving prelicensure, preregistration, undergraduate, and recently graduated levels. A smaller number of research studies elaborated interdisciplinary participants, for instance midwifery students, pharmacy interns, international health students, and physician assistants.

This litruture review included a total of 1,160 participants from 21 countries including Spain (n = 11), the USA (n = 10), Australia (n = 6), England (n = 3), China (n = 2), Saudi Arabia (n = 2), South Korea (n = 2), Ghana (n = 2), Poland (n = 2), Italy (n = 1), North India (n = 1), Indonesia (n = 1), Jordan (n = 1), New Zealand (n = 1), Singapore (n = 1), Turkey (n = 1), France (n = 1), Brunei (n = 1), Nepal (n = 1), Malaysia (n = 1), and Nigeria (n = 1).

The intervention implemented in the studies diverse broadly, however centered about innovative academic-practice partenerships, models, hybrid training, workforce deployment during COVID-19, and volunteer or practicum placements. The nursing interventions scrutinzed in this systematic review encompassed a vast range of innovative academic-practice initiatives and workforce extention model. These included prgrams, for instance "innovative academic-practice partnership", "innovative academic-practice partnership", "pilot nursing student/graduate aide program", "VaxForce", "training sessions", "novel undergraduate nursing employee/student hybrid" (UNE/Hybrid), "blended learning program", "registered undergraduate student of midwifery" (RUSOM) model", "critical care hybrid course on nurses' skills", "contract of relief", "nursing support health aides", "clinical placement experiences", "workforce during the COVID-19 pandemic", "essential frontline workers", "registered nurse extenders", or workforce expanders", "focus group discussion", "lived experiences", "clinical rotations", "clinical placements", "student volunteering projects (SVPs)", "students' role as healthcare aid", "rural undergraduate nursing student employment model", "auxiliary health workers", "rushed labor insertion", "disaster nursing preparedness training program", and "clinical practicum". By using inductive coding and thematic grouping, five key themes emerged from the analysis:

**Theme 1: Enhanced Clinical Competence Through Real-World integration**
Many studies (n = 34, 65.4%) highlights the positive influence of academic-practice innovations on students' acquisition of knowledge and development of clinical skills. During interventions, for instance simulation training, hybrid placement, and workforce extender roles, students gained exposure to authentic clinical environments. Also, learning occurred across diverse domains, for instance emergency preparedness, critical care delivery, health assessment, patient triage, and infection control. As a result, this theme reflects how embedded practice opportunities bridge theoretical knowledge with applied competencies, enhancing readiness for real-world clinical demands.

Research study publications by year are evidence in Figure 2. Learning outcomes were evaluated in the form of acquiring knowledge, skill performance, learner satisfaction, critical thinking, and self-confidence (Figure 3).
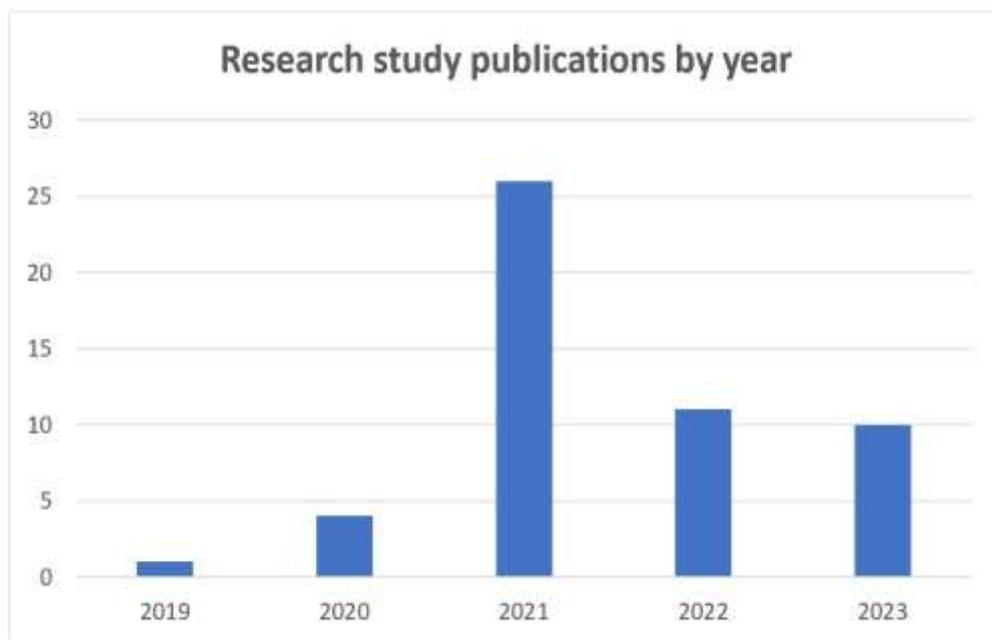


**Figure 2:** Research Study Publications By Year.

**Them 2: Moral Duty and Willingness to Serve**

Approximately 11 studies explored students' willingness to work during COVID-19 pandemic, revealing a strong sense of moral obligation. Nursing students viewed participation in pandemic response as an ethical responsibility and a formative component of their professional identity. Also, volunteering, participation in government-led programs as VaxForce, and clinical deployment were seen as opportunities to make significant contributions to society health. As a result, this theme reflects how underscored the alignment between nursing students' values and their perception of professional adherence in crises.

**Theme 3: Self-Confidence and Professional Identity Formation**

Thirty-four (65.4%) of the 52 studies evaluated the outcomes of skills resulting from academic-practice innovations. Nearly half of the studies (n = 24, 46.15%) reported increased self-confidence in providing safe and independent care, especially in uncertain or complex clinical settings. Interventions as student hybrid employee roles, for instance hybrid prgrams and auxiliary workforce deployment computed students to engage deeply with practice. Whereby, strengthen their professional identity, for example facing fears, consider real patients, and being acknowledge essential contributions encouraged students' resilience and belief in their qualities. Nursing skills, which improved owing to these innovations, included health assessment proficiencies; collaborative role development; implementation and evaluation of nursing plans of care; preparation as a nurse; teaching; clinical competence; technical proficiency; and adaptation to a rapidly changing practice environment, identifying conflicts, working as a team, and consider critical patients. As a result, this theme reflects how learning outcomes varied depending on the context and settings. They were observed in a variety of scenarios, including hands-on training, nursing experience, real clinical experience, professional growth, communication skills, advanced care, and strategies for the management of future pandemics. More also examplse of learning outcomes were emergency preparedness, autonomy, coping with patient triage, provision of critical or end-of-life care, teamwork, identification of conflicts, and safety measures.

**Theme 4: Learner Satisfaction and Engagement**

Nineteen studies (36.54%) addressed learners' subjective experience of satisfaction and engagement with academic-practice innovation. Satisfaction was associated with, feeling valued, gaining meaningful experience, having flexible learning opportunities, and a reduced sense of disruption during the pandemic. These interventions allowed learners to feel part of blended learning programs and student-led support services contributed to a positive educational climate. In term of satisfaction, the studies examined students' perceptions of their experiences, including appreciation and feeling valued as team members; independence in nursing care, and perceived or real benefits of nursing innovations during the COVID-19 pandemic. In addition, other area explored critical thinking, clinical judgment abilities, communication skills, health assessment proficiencies, collaborative role development, and implementation and evaluation of nursing plans of care. Moreover, learners reported that gaining the required learning experience and confidence to allow safe nursing care, and reduced disruption. As a result, this theme reflects how learners increased engagement, confidence, and tolerance, reduced stress, improved access and flexibility, a greater sense of independence, reduced cost and positive workforce strategies that contributed to learners' work readiness and their identity as nurses.
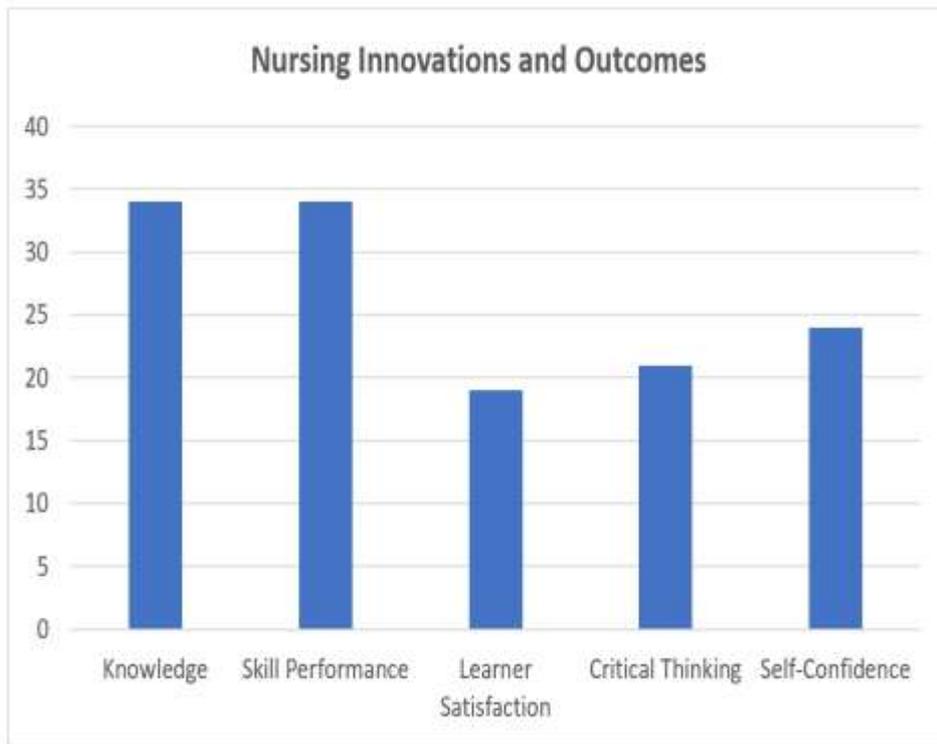
**Figure 3:** Nursing Academic-Practice Innovations and Learning Outcomes.

**Theme 5: Growth in Critical thinking**
Twenty-one studies (40.38%) highlighted gains in critical thinking. Learners demonstrated improved abilities in clinical-decision making, patients' prioritization, clinical-judgment, and problem-solving. These outcomes were frequently connected to active participation in significant environment, for instance pandemic units, emergency departments, as well as relief nursing initiatives. This theme reflects how interventions enabled learners to develop not only technical skills, but also reflective, analytical, leadership competencies. As a result, several studies reported that enhanced management skills, specifically in task execution and delegation doing task and delegation which are essential for innovative nursing roles

**Table 1: Nursing student learning outcomes through academic-practice innovations**

| Authors & Year | Acquiring (Knowledge) | Skill Performance | Learner Satisfaction | Critical Thinking | Self-Confidence |
|---|---|---|---|---|---|
| Branson et al. 2023 | Raised | Expanded | Satisfied | Raised | Elevated |
| Talley et al., 2023 | Raised | Expanded | Satisfied | Raised | Elevated |
| Chan et al., 2023 | Raised | Expanded | Satisfied | - | - |
| Usher Am et al., 2023 | Raised | Expanded | - | Raised | - |
| Kulshreshtha et al., 2023 | Raised | Expanded | Satisfied | - | Elevated |
| Shajani et al., 2023 | Raised | Expanded | Satisfied | Raised | Elevated |
| Janes et al., 2023 | Raised | Expanded | Satisfied | Raised | Elevated |
| Mumford et al., 2023 | Raised | Expanded | Satisfied | - | Elevated |

| | | | | |
|---|---|---|---|---|
| Hadid et al., 2023 | Raised | Expanded | Satisfied | Raised | Elevated |
| Gomez-Moreno et al., 2022 | Raised | Expanded | Satisfied | - | Elevated |
| Vazquez-Catalayud et al., 2022 | Raised | Expanded | Satisfied | Raised | Elevated |
| Barisone et al., 2022 | Raised | Expanded | - | Raised | Elevated |
| Palacios-Cena et al., 2022 | Raised | Expanded | - | Raised | Elevated |
| Jagroop-Dearing et al., 2022 | Raised | Expanded | - | Raised | Elevated |
| Richard et al., 2022 | Raised | Expanded | - | Raised | - |
| Diamond-Caravella et al., 2022 | Raised | Expanded | Satisfied | Raised | Elevated |
| Willetts et al., 2022 | Raised | Expanded | - | - | Elevated |
| Hahn-Schroeder et al., 2022 | Raised | Expanded | - | - | - |
| Seah et al. 2021 | Raised | Expanded | satisfied | Raised | Elevated |
| Martin-Delgado et al. 2021 | Raised | Expanded | Satisfied | Raised | Elevated |
| Intinaralli et al., 2021 | Raised | Expanded | Satisfied | - | - |
| Chawaloska et al., 2021 | Raised | Expanded | - | - | - |
| Bazan et al., 2021 | Raised | Expanded | Satisfied | Raised | Elevated |
| Casafont et al., 2021 | Raised | Expanded | Satisfied | - | Elevated |
| Chandler-Jeanville et al., 2021 | Raised | Expanded | - | - | Elevated |
| Godbold et al., 2021 | Raised | Expanded | - | - | - |
| McSherry et al., 2021 | Raised | Expanded | Satisfied | - | Elevated |
| Kenny et al., 2021 | Raised | Expanded | - | Raised | Elevated |
| Howard et al., 2021 | Raised | Expanded | - | Raised | Elevated |
| Velarde-Garcia et al., 2021 | Raised | Expanded | - | Raised | Elevated |
| Roca et al., 2021 | Raised | Expanded | - | Raised | Elevated |
| Hernandez-Martinez et al., 2021 | Raised | Expanded | Not Satisfied | Raised | - |
| Gomez-Ibanez et al., 2020 | Raised | Expanded | Satisfied | - | - |
| Xia et al. 2020 | Raised | Expanded | - | Raised | - |

### Synthesis of the Results

The results of this systematic review were categorized based on the levels of evidence defined by Melnyk and Fineout-Overholt (2015). From the studies reviewed, 1, 10, 41 were rated at levels 6, 3 and 7, respectively. Therefore, less than one-fifth (19.23%) of the studies were considered high quality, while more than four-fifths (80.77%) were rated as low quality. In this context, the studies with mixed methods designs (n = 10) had the highest level of evidence demonstrating the greatest gains in

academic-practice innovations. The most common study design was cross-sectional or qualitative (n = 41). No randomized controlled studies (RCTs) on the topic of interest were available in the literature, possibly because of unique or innovative topics, strict inclusion criteria and the fact that the pandemic was the most recent.

**Bias and Conflicting Risk of this Review**

In this systematic review, risks and conflicts were pinpointed across the studies. CASP tools were applied according to the type of studies to assess the risk of bias. The most common areas of potential bias included single site, small sample size, lack of RCTs, lack of identification of confounding factors, and absence of reporting confidence intervals (Branson, et al., 2023; Ahn, & Choi, 2019; Talley, et al., 2023). Moreover, the emergence of academic practice innovations among nursing students has resulted in significant improvements in learning outcomes, such as improved knowledge and enhanced skills competence, satisfaction, critical thinking, and self-efficacy (Al Hadid, Al Barmawi, & Alnjadat, 2023; Roca, Canet-Vélez, Cemeli, Lavedán, Masot, & Botigué, 2021; Janes, Ekpenyong, Mbeah-Bankas, & Serrant, 2023; Velarde-García, et al., 2021) However, in one study, the students reported several experiences of incivility, , including lack of respect, lack of role models, excessive demands, hostility and mean behavior Similarly, lack of knowledge, skills and adequate training associated with fear of unpreparedness (Collado-Boira et al., 2020; Ahn, & Choi, 2019; Karki et al., 2021; Hernández-Martínez, et al., 2021; Kulshreshtha, et al., 2023). According to one of the reviewed studies, 51.9% of students were not satisfied with their salary or safety conditions (Hernandez-Martinez et al., 2021; Liu, Xi, Zhu, Ji, Zhang, & Yang, 2021; Al Gharash, Smith, & Cusack, 2021; Mannino, Watters, Cotter, Armstrong, Moore, Bongiorno, & Kelley, 2021). In these studies, researchers reported that fatigue was common among nursing students in the postpandemic era and was associated with low quality of life (Bazan, Nowicki, & Rzymski, 2021; Cervera-Gasch, González-Chordá, & Mena-Tudela, 2020). In one study by Chandler-Jeanville et al. (2021), the participants considered their experience to be a burden of tough working conditions and felt that they were vulnerable to psychological issues. In another study conducted by Amoo, Menlah, Garti, and Appiah (2021) students reported that they were experienced bullying practices such as shouting, isolation, humiliation and being assigned tasks below their competency level (Howard, Hartman, Allen, & Reynolds, 2021). Barriers to volunteer work were lack of interest, personal health issues, lack of protocol and knowledge, and transportation issues (Adejumo, et al., 2021; Alomar et al., 2021; Al Gharash, et al., 2021). Moreover, the students reported that emergency remote teaching negatively affected their overall wellbeing, creates difficulties in learning, and highlights challenges in obtaining clinical experiences and developing nursing skills (Michel et al. 2021; Chan, Metzger, Sablik, & Goldberg, 2023; Barisone, et al., 2022).

**Gaps of this Literature Review**

The researcher recognized a significant gap in the healthcare workforce literature, namely the scarcity of large-scale, multicenter or international studies, and RCTs. Barriers to volunteerism may be mitigated among the implementation of multiple innovative strategies, such as the provision of sufficient training, personal protective equipment, and supportive from senior personnel. Although, compensation may encourage students to work during pandemics to combat nursing shortages. However, majority of nursing students particularized a strong sense of moral and religious obligation to care for COVID-19 patients.

**Discussion**

The COVID-19 pandemic exhausted the nursing workforce, leading to the transformation of the nursing shortage into a full-blown crisis worldwide. Therefore, nursing students were encouraged to assist nursing staff in taking care of critical patients during the pandemic. This systematic review was conducted to assess nursing students as workforce extenders during the pandemic as an education innovation. The review also assessed the willingness of nursing students to work with COVID-19 patients during the pandemic. Despite all the fears and negative emotions, most of the nursing students were willing to work during the pandemic as nursing assistants as well as to care for patients suffering from COVID-19. Wonderfully, the students considered it their professional and moral responsibility to

provide care to patients with COVID-19 (Chawłowska, et al., 2021; Jagroop-Dearing, et al., 2022; Martin-Delgado, et al., 2021).

**Evidence-Based Practice**

To overcome this shortage, an academic-practice partnership is an innovative way to involve nursing students to assist nurses, especially during pandemics that is an evidence-based practice,. In this context, 40 studies were found that applied interventions in which nursing students were involved directly or indirectly with patient care. These innovations included innovative academic-practice partnerships (Branson et al. 2023; Diamond-Caravella, Fox, Clark, Goodstone, & Glaser, 2022; Hahn-Schroeder et al., 2022; Howard et al., 2021), graduate aide programmes (Talley et al., 2023), VaxForce (Chan et al., 2023), training sessions (Kulshreshtha et al., 2023), blended learning programmes (Janes et al., 2023), registered undergraduate of midwifery (RUSOM) models (Mumford et al., 2023), contracts of relief (Gomez-Moreno et al., 2022), clinical placement experiences (Barisone et al., 2022), student volunteering projects (Chawaloska et al., 2021; Bazan et al., 2021), rushed labor insertion (Gomez-Ibanez et al., 2020), and disaster nursing preparedness training programmes (Xia et al. 2020). All these innovative interventions produced positive learning outcomes. Therefore, such nursing interventions are helpful for preparing nursing students to assist nursing staff or work as a nursing workforce, especially when there is a shortage of nurses (McKitterick, Corsini, Peters, Chiarella, & Eckert, 2022; Cheah, et al., 2021).

In contrast, a study reported that nursing students experienced bullying practices such as shouting, isolation, humiliation and being assigned tasks below their competency level during clinical placement (Amoo et al., 2021). In addition, researchers highlighted certain barriers to volunteer work, such as lack of interest, personal health issues, lack of protocol and knowledge and transportation issues (Alomar et al. (2021; Seah, Ho, Liaw, Ang, & Lau, 2021; Liu et al., 2021). Also, some researchers reported that fatigue was the most common issue among nursing students in the post-COVID-19 era, which was associated with low quality of life (Godbold, Whiting, Adams, Naidu, & Pattison, 2021; Kenny, Dickson-Swift, DeVecchi, Phillips, Hodge, & Masood, 2021). Similarly, Chandler-Jeanville et al. (2021) reported that participants considered their lived experience to be a burden of tough working conditions. In addition, they also felt that they were vulnerable to psychological issues (Amoo, et al., 2021; . Ningsih, D.K., Ulya, I., Kartika, A.W. and Islam, K.M. (2023; Richard, et al., 2022; Palacios-Ceña, et al., 2022). Chan, et al. (2023) reported that the pandemic strengthened the desire to become nurses among nursing students; however, they also reported that emergency remote teaching negatively affected their overall wellbeing, created difficulties in learning, and highlighted challenges in obtaining clinical experiences and developing nursing skills (Vázquez-Calatayud, Rumeu-Casares, Olano-Lizarraga, & Regaira Martínez2022; Kim, Kim, & Kim, 2022).

Additionally, the nursing students are an invaluable resource for combatting nursing shortages, and they are highly willing to participate in disaster management. Moreover, the academic-practice partnership programs are innovative interventions, especially during pandemics when the shortage of nursing staff is exacerbated (Jumah, Nouh, Faltah, & Alonazi, 2024; Williamson, Kane, Evans, Attrill, Cook, & Nash, 2023; Willetts, Nieuwoudt, Olasoji, Sadoughi & Garvey, 2022; Usher Am, et al., 2023)

**Linking Evidence to Action**

Nursing students receive adequate clinical experience, demonstrating their ability to contribute significantly to the nursing field. Programs for academic-practice partnerships are creative solutions, particularly in times of pandemic when the scarcity of nurses is worsened. As a result, academic and professional administration in the nursing field can be crucial to nursing students' successful attainment of EBP competency.

**Conclusion**

This systematic review synthesized findings from 52 studies across 21 countries, involving 1, 160 predominantly nursing students and some interdisciplinary participates, highlighting diverse academic-practice innovations during COVID-19 pandemic. The interventions, ranging from hybrid training models to workforce deployment and volunteer programs, significantly enhanced clinical competence by integrating real-world experiences, fostering critical thinking, and strengthening professional

identity. Learners indicated increased self-confidence, moral commitment, and engagement, reflecting a deepened sense of belonging and readiness for practice. Satisfaction with these learning experiences was associated with flexible, meaningful involvement, and supportive educational environments. Collectively, these themes underscore the vital role of innovative academic-practice partnerships in preparing nursing students to meet evolving healthcare demands, especially in crisis contexts. Future research must focus on large-scale, multicenter studies to further validate and expand these promising models for workforce development and nursing education.

**Implications and Recommendations**

The findings of this systematic review highlights the immediate need for organization policy reformed curriculum innovation to support the effective integration of nursing students as workforce extenders, specially during health crises as the COVID-19 pandemic. Academic institutions and healthcare organizations have to initiate formal academic-practice partnerships with clearly defined roles and scope of practice for nursing students who engaged in expanded workforce activities. These partnerships should be supported by organizational policies that ensure legal protections, supervision, and safety protocols during deployment. In addition, emergency preparation frameworks must include nursing students as components of emergency response capacity planning with recognition mechanisms as academic credits or financial incentives. Moreover, institutions must implement robust support system. For instance, mental health services, reflective debriefing, and peer mentoring to promote resilience and well-being among learners who exposed to high-pressure clinical environments. Monitoring tools should also be established to evaluate learners' outcomes and institutional readiness, informing policy refinement and assuring quality assurance (Jumah, Hamdi, Mohmoud, Alghamdi, Althagafi, 2025: Melnyk & Fineaou-Overholt, 2019).

In terms of academic programming, nursing curricula must be redesigned to set up academic-practice innovations and crisis-readiness training that core components of clinical education. This should include competency-based models which highlights skill acquisition in critical thinking, clinical judgment, teamwork, and emergency response (Bin Jumah & Ruland, 2015; Page et al., 2021). Educational strategies, for instance simulation-based learning, interprofessional collaboration, and hybrid training roles as student employee models which provide realistic and flexible learning environments that prepare learners for under predictable healthcare demands (Jumah, et al., 2024).). In addition, public health preparation modules as disaster nursing, infection control, and ethical decision-making in crises must incorporate into core coursework. Emotional resilience and professional identity development have to be supported through experiential learning and faculty mentorship. By prioritizing structured alignment to real-world practice in both routine and emergency contexts, nursing programs can advance student learning outcomes. Additionally, it established strengthen healthcare system, and assured that learners are confident, competent, and ethically grounded providers to nursing workforce (CASP, 2018, ).

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