

Kirkpatrick's Model in Nursing Education: A Critical Evaluation of Benefits and Drawbacks

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Background: Kirkpatrick model is one of models used in higher education evaluation. However, there is limited evidence on usage of this model in nursing education.

Aim & Methodology: This study was conducted as a systematic literature review aimed at critically synthesizing evidence regarding the application of the Kirkpatrick Model for evaluating nursing education programs. A comprehensive search guided data screening process was utilized in the current review, including four sources (Web of Science, PubMed, Scopus, and Google Scholar databases) for studies between 2018 and 2025. Keywords used included were Kirkpatrick model, nursing educational programs, formative and summative evaluation methods. Initially, a total of 179 articles were reviewed, 51 full text were checked. Then, thirty-one articles met the desired eligibility criteria.

Results: Through literature, Kirkpatrick model has been recognized for its conceptual clarity and practical applicability. Most of studied articles (58.1%; n=18) reported that this model guarantees that educational initiatives are synchronized with learning goals and result in significant changes in behavior within clinical settings. Conversely, (41.9%; n=13) of articles documented several drawbacks for utilizing Kirkpatrick model for assessing nursing programs. They reported that many of the utilized tools for measuring behavioral and result-oriented constructs exhibit limited psychometric validation, casting doubt on the methodological soundness of the studies employing them

Conclusion: It is concluded that the Kirkpatrick application framework by far continues to be wielded as one of the most popular models to evaluate nursing educational programs because of its concept clarity and structure, multi-level assessment each level leading upward to behaviors.

Keywords: Kirkpatrick model, nursing programs; Benefits; Drawbacks

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Introduction

An effective nursing workforce is an essential component to good quality patient care because the education of nurses efficiently forms the basis for professional nursing practice and ensures that those graduating from a nurse education program have appropriate knowledge, skills and attitudes to deliver safe and high-quality patient care in an ethically acceptable manner. It is important, therefore, that a robust evaluation of nursing educational programs ensures that teaching approaches, curricula configuration and clinical placement experiences are aligned with ILOs which help to promote the delivery of quality healthcare⁽¹⁾.

Healthcare systems around the world are under pressure from rising population levels, ageing populations, an increasing burden of chronic diseases and new infections as well as rapid technological changes in healthcare delivery. These challenges have significantly amplified the need for competent nurses to deliver safe and evidence-based patient-centered care^(2,3). The World Health Organization has described the proportion of nurses within the healthcare workforce as the largest and stated that with a more competent nursing force it would lead to better quality of care for patients. As a result, nursing education programs must adapt over time to ensure that graduates have clinical competencies, critical thinking skills and professional behaviors needed for contemporary health care environments⁽⁴⁾.

In this context, numerous studies documented that in a time characterized by swift progress in healthcare technology, intricate patients' requirements, and changing professional standards, nursing educational programs must be regularly evaluated and enhanced their efficiency. They believe that evaluating programs is not only assessing academic success, but it is a much broader and extensive process that analyzes the effectiveness of educational interventions in fostering clinical skills and professional development^(1,5,6).

Some assessed studies highlighted the significance of reworking the education approaches used in vocational training, which ensure that clients are not subjected to unnecessary risks, as crucial factors to consider when aiming to improve nursing outcome^(1,7). In this line, a strong consensus among researchers highlight that evaluation academic and learning programs plays a vital role in ensuring that learning and development initiatives fulfill strategic organizational aims and comply with stakeholder expectations therefore, strengths and weaknesses can be determined and accordingly improvements made^(8,9).

The quality of nursing education programs is critical for patient safety and the provision of quality healthcare services because knowledge, skills and clinical competency are directly transferred from nurses to patients. As health care systems and technologies evolve, nursing education programs must regularly be evaluated to determine whether they are adequately preparing competence-based nurses. Hence, robust evaluation models are vital to ascertain if these educational interventions result in desired learning and clinical outcomes⁽¹⁰⁾. Many researchers believe that an effective academic program evaluation comprises an extensive assessment of curriculum, teaching methods, learning settings, extracurricular activities, research output, perspectives and feedback from students and stakeholders ⁽¹¹⁾. To look at how the Kirkpatrick Model is used in practice, full guide with examples can be found here — set of learning objectives which is simple and systematic method for assessing training results based on Reaction, Learning, Behavior and Results (4 levels) Its benefits and disadvantages in nursing education, on the other hand, have been described only in a few studies (thus call for this review).

Additionally, Gertler et al. reported that training assessment is important for policymakers for making informed decisions, like ending ineffective programs and enhancing the efficient ones. Moreover, they believe that assessment highlights the training weaknesses that need

further improvement and may provide an insight into strategies for enhancing training programs⁽¹²⁾. Consistently with this, Rampun et al claimed that training processes must be continuously assessed to ascertain the efficacy of various training program's components⁽¹¹⁾.

Many scientists believe that in order to ascertain whether these academic programs are proceeding in the correct direction and effectively fulfilling their training objectives, it is imperative to subject them to continuous evaluation. They concluded that continuous examination enhances the educational system from an emphasis on rote-learning to daily learning and efficiency acquisition. It is of advantage to both students, teachers and institutions because it stimulates regular interaction, gives feedback directly, directs teaching practice as well as monitors over the effectiveness and relevancy of curricula^(13,14).

To conduct such assessments, numerous models have been developed, among them, Kirkpatrick Evaluation Model is recognized to be standing out as one of the most lasting and commonly used frameworks for assessing wide range of programs including educational programs either formal or informal sort of education⁽¹⁾.

The Kirkpatrick Evaluation Model, developed by Donald Kirkpatrick in 1959, provides a four-level framework for evaluating the effectiveness of training programs. i.e., (Response; Learning; behavior; and Results). Kirkpatrick's four levels model has had an immeasurable impact 16 on the development of assessment methodologies for training⁽¹⁵⁾.

A considerable number of studies pointed out that these four steps collectively provide a structured framework for evaluating educational programs, from learners' initial perceptions to long-term impacts on performance and organizational effectiveness. Its structured design and flexibility have led to widespread use of such models across fields such as business, healthcare, and educational programs respectively. The Kirkpatrick Model's levels as mentioned by Alsalamah, Callinan, and Nguyen et al.,^(16,17) are:

Reaction: (This first step is for finding out how participants respond to training, including their satisfaction level, contribution, and relevant to their career.).

Learning: (The second step is to determine the level of knowledge, skills, and attitude changes after implementing the educational intervention

Behavior: (The third step is for assessing how participants apply what they learned effectively in healthcare institutions.

Results: (The fourth and the last step is for evaluating the training's impact on organizational performance, and clinical outcomes.

When it comes to nursing education, continuous enhancement in teaching and learning methodologies is considered a backbone for ensuring the highest quality of patient care. Jones et al reported that in order to fulfill the evolving needs of the profession, nurses must possess the most updated knowledge and skills as healthcare practices change. They suggested that educators and institutions should implement efficient tactics for improving the learning process. They noted that effective training will enhance the employees' creativity in the workplaces⁽¹⁸⁾.

From this perspective, many scientists argued that the Kirkpatrick Model has been widely used all over the world to assess numerous educational programs including nursing training programs. They highlighted that this model has been proven to be appropriate as long as the right instruments are chosen at each level. They stated that it has been used to evaluate in-person training programs, simulation-based learning, ongoing education, and classroom instruction ⁽¹⁹⁻²¹⁾. In this context, systematic evaluation of nursing educational programs has become more useful in probing the impact of educational interventions on learners' knowledge, clinical performance and healthcare outcomes. Hence, it is important to use structured evaluation frameworks like the Kirkpatrick Model to evaluate nursing education in relation to clinical practicality in this context.

Materials And Methods

Study design and setting

This study was conducted as a systematic literature review aimed at critically synthesizing evidence regarding the application of the Kirkpatrick Model in nursing education program evaluation. It utilized systematic review of literature and meta-analyses to systematically search, appraise, and synthesize the existing research on use of the Kirkpatrick Model in nursing education program evaluation. The methodological quality of the included studies was evaluated using Joanna Briggs Institute (JBI) critical appraisal principles appropriate for the included study designs.

Study participants and sampling

Database searches were conducted for articles published between 2015 and mid-2025 (inclusive) in various sources: Web of Science, PubMed, Scopus, Google Scholar databases included. The keywords used were “Kirkpatrick Model” and nursing programs, behavior changes, patient outcomes/ satisfaction, program evaluation. The

Search Strategy includes (“Kirkpatrick Model” OR “Kirkpatrick Evaluation Model”) AND (“nursing education” OR “nursing training” OR “nursing programs”) AND (“program evaluation” OR “learning outcomes” OR “behavior change” OR “patient outcomes”).

Data collection tool and technique

The search initially yielded 179 studies pertaining to the review issue. After review of the secondary inclusion, 128 articles were removed either because their titles appeared irrelevant to our field, the abstracts or it seems that full texts were studied as an independent predictor. The remaining 51 full-text articles were obtained and carefully evaluated for inclusion. Studies were screened in three stages: title alone, then abstracts before the full-text articles using predefined selection criteria which has been clarified at table (1). Thus, we have included only 31 studies in this systematic review and meta-analysis.

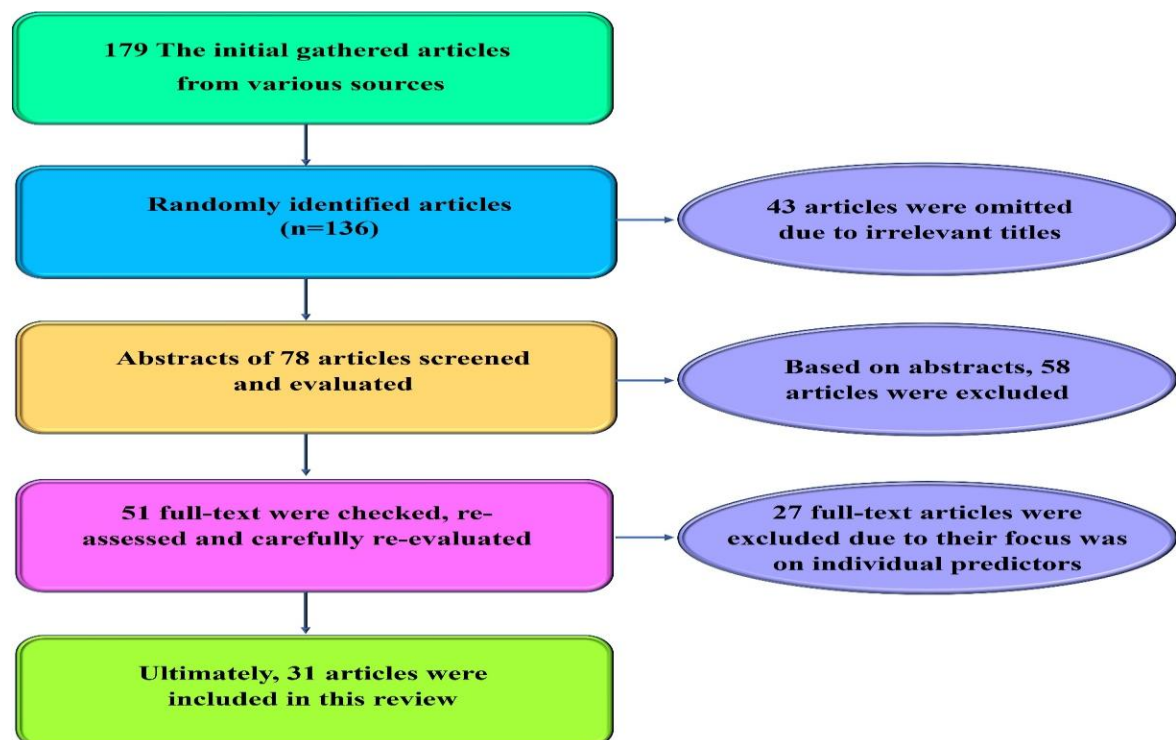


Figure 1. Shows the workflow diagram for selecting eligible articles that are included in the current review.

Table 1: Inclusion and exclusion criteria for selecting articles

Inclusion Criteria	Exclusion Criteria
Peer reviewed accessible literature	Not fully accessible articles
Published in English language	Published prior to the year 2015
Published from year 2015 to date	Published in other languages rather than English
Articles that relevant to this article's topic.	Not relevant to the article's topic

The primary objective of this review was to provide a critical appraisal of the Kirkpatrick Evaluation Model in nursing education by identifying both its strengths and weaknesses as an educational outcome testing method. Specifically, this study seeks to:

Trace how the Kirkpatrick Evaluation Model has been integrated across diverse areas and domains of nursing education.

Appraise the strengths of using the Kirkpatrick Model in evaluating nursing education, and coherence with competency-based learning outcomes as reported by various studies.

Describe the limitations and obstacles of using the model, as indicated by the literature.

Assess the extent to which the Kirkpatrick Model informs evidence-based evaluation.

Making recommendations for revisions or recommending a scaffold that could further enhance the model in contemporary nursing education.

Based on these goals, the present study aims to contribute to existing literature as it relates to educational assessment in nursing.

Statistical analysis

A descriptive analysis was performed to summarize and present the results of included studies (as indicated in Table 2 for data extraction). Frequencies and percentages expressed the distribution of studies by Kirkpatrick level evaluated, benefits reported, and limitations identified. All selected articles were critically synthesized and narratively analyzed for common themes and patterns regarding the use of the Kirkpatrick model in nursing education programs. Since the studies

differed due to methodological heterogeneity in study designs, outcome measures, and evaluation tools no meta-analysis of the data was performed.

Results

This document has presented an extensive summary of the qualitative peer-reviewed literature concerning usages of Kirkpatrick's model for assessing nursing educational programs.

Out of 179 articles that were retrieved from various searches, thirty –one potentially eligible article had been included in the current review. It seems that the first two steps in Kirkpatrick's model (reaction and learning) were considered internal criteria that focus on what happens within the educational program, while the other two steps (behavioral changes and results) were considered as external criteria that concern with changes that are likely to happen outside the program which are most properly influenced by other factors rather than learning or behavioral changes, in terms of organizational contexts and policies respectively.

The data extraction table (Table 2) is a structured tool for aggregating and synthesizing the characteristics of the studies included in the review. It summarizes the key information from each article, such as the author and year of publication, country of study, research design, type of nursing educational or training program, Kirkpatrick evaluation levels assessed and main outcomes regarding effectiveness or limitations of model. This organized presentation enables comparison between studies and helps to determine uniform findings regarding the implementation, advantages and disadvantages of

the Kirkpatrick model in nursing education evaluation.

Table 2: Data Extraction of Included Studies Evaluating the Kirkpatrick Model in Nursing Education (N = 31)

Author/Year	Country	Design	Nursing Program / Training	Kirkpatrick Level(s) Evaluated	Main Findings
Alsyabany, 2019 (1)	Saudi Arabia	Review study	Educational and training programs	All levels	The model was effective for evaluating educational outcomes and training effectiveness.
Heeneman et al., 2015 (5)	Netherlands	Qualitative study	Programmatic assessment in medical education	Learning, Behavior	Programmatic assessment improved student learning and feedback integration.
Schuwirth et al., 2017 (6)	Netherlands	Perspective paper	Medical education assessment	Learning, Results	Assessment systems should align with healthcare quality outcomes.
Almusaed et al., 2023 (7)	Sweden	Review analysis	AI-assisted hybrid education	Reaction, Learning	Technology-enhanced learning improved engagement and educational effectiveness.
Deodhar & Powdwal, 2017 (8)	India	Cross-sectional study	Continuing education programs	Reaction, Learning	Continuing education positively influenced professional competencies.
Lee & Song, 2021 (9)	South Korea	Scoping review	Accelerated nursing programs	All levels	The model was useful but lacked strong evidence for hierarchical assumptions.
Zainol & Tajuddin, 2021 (11)	Malaysia	Analytical study	Training transfer programs	Behavior, Results	Training transfer significantly influenced program effectiveness.

Gertler et al., 2016 (12)	USA	Methodological text	Training impact evaluation	Results	Program evaluation supports evidence-based policy decisions.
Grzeskowiak et al., 2015 (13)	Australia	Systematic review	Audience response systems in healthcare training	Reaction, Learning	Interactive educational tools enhanced learner engagement and retention.
Van der Vleuten et al., 2015 (14)	Netherlands	Educational guideline	Programmatic assessment	Learning, Behavior	Continuous assessment strengthened competency-based education.
Huang et al., 2022 (15)	China	Observational study	Nursing innovation training	All levels	Innovation training improved nurses' professional competencies.
Alsalamah & Callinan, 2021 (16)	Saudi Arabia	Evaluation study	Head teacher training programs	Reaction, Learning	The adapted model was flexible and practical in educational evaluation.
Nguyen et al., 2024 (17)	Vietnam	Prospective intervention	Trauma care training	Learning, Behavior	Significant improvement in knowledge and clinical practice.
Jones et al., 2018 (18)	United Kingdom	Program evaluation	Pediatric nursing service	Reaction, Results	Educational interventions improved service delivery outcomes.
Cutting et al., 2022 (19)	Japan	Evaluation study	Pre-departure educational training	Reaction, Learning	Participants reported high satisfaction and improved preparedness.
Pateda et al., 2020 (20)	Indonesia	Program evaluation	Educational class training	All levels	Kirkpatrick model effectively assessed educational interventions.
Elsheikh et al., 2025 (21)	Egypt	Prospective cohort	Infection control ICU training	All levels	Training improved infection-control practices and compliance.
Sudarmika et al., 2023 (22)	Indonesia	Qualitative descriptive	Nurses and midwives training	Behavior, Results	The model was adaptable across healthcare training settings.
Liu et al., 2025 (23)	China	Observational study	New nurse standardi	Reaction, Learning	Improved competency and learner satisfaction were observed.

			zed training		
Gandomkar, 2018 (24)	Iran	Comparative review	Evaluation models in medical education	All levels	Kirkpatrick model was practical but less comprehensive than CIPP.
Ambu-Saidi et al., 2024 (25)	Malaysia	Critical review	Training evaluation models	All levels	The model required methodological strengthening.
Aljanabi, 2022 (33)	Iraq	Educational evaluation	Nursing learning environment	Behavior, Results	Educational programs enhanced healthcare outcomes.
Cordon et al., 2025 (26)	USA	Program evaluation	Novice nurse transition program	Reaction, Learning, Behavior	Improved transition to independent nursing practice.
Schut et al., 2018 (27)	Netherlands	International study	Programmatic assessment	Behavior	Learners' perceptions affected assessment outcomes.
Johnston et al., 2018 (28)	Australia	Systematic review	Simulation and debriefing education	Learning, Behavior	Simulation improved confidence and clinical performance.
Yang et al., 2025 (29)	China	Evaluation study	Rehabilitation nursing training	Learning, Behavior	Rehabilitation competencies improved significantly.
Miranda et al., 2025 (30)	Brazil	Integrative review	Nursing professional training	All levels	Strengths and methodological limitations were identified.
Dwikurnani ngsih & Waruwu, 2022 (31)	Indonesia	Evaluation study	Online lecturer training	Learning, Results	Training outcomes were influenced by demographic variables.
Reio et al., 2017 (32)	USA	Critical review	Training evaluation frameworks	All levels	The model was criticized for oversimplification and linearity assumptions.
Callinan et al., 2021 (16)	Saudi Arabia	Educational evaluation	Leadership training	Reaction, Learning	Training effectiveness and learner satisfaction improved.

Liu & Ren, 2025 (23)	China	Training evaluation	Clinical nursing education	Learning, Results	Positive impact on nurses' competency and organizational outcomes.
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Discussion

Most articles (58.1%; n=18) reported that this model guarantees that educational initiatives are in sync with learning goals and result in significant changes in behavior within clinical settings. They believe that its adaptability makes it suitable for diverse nursing education environments, and its emphasis on quantifiable results fosters evidence-driven decisions and ongoing enhancement of nursing programs. Numbers of the surveyed studies have revealed that the effectiveness and the high degree of flexibility explain that Kirkpatrick's model is suitable and applicable to be used for evaluating various types of educational programs ^(21, 22). Moreover, Liu et al stated that this model is straightforward, functional, and easy to comprehend. It offers a framework for assessment and does not demand excessive time for implementation. They believe that it offers a methodical foundation for comprehending how educational interventions impact students' views, acquisition of knowledge, behavioral performance, and general professional outcomes with high learner acceptability rates besides it provides immediate feedback that makes it useful to educators as well ⁽²³⁾.

Additionally, couple of research have shown that it is beneficial in assessing the strengths and limitations of educational interventions, as well as providing data to help in curriculum development. For instance, for measuring students' satisfaction and cognitive development, level one and two will be useful, whereas level three seeks to evaluates the learners' behavioral changes in clinical setting, and finally level four could be followed for evaluating improvements in patient care outcomes respectively ^(24, 25). Moreover, according to Aljanabi, this model is enabling teachers to establish a dynamic learning

environment that optimizes nurses' potential and therefore improves healthcare outcomes⁽²⁶⁾.

Nevertheless, it had been reported that there are certain difficulties and challenges when putting this model into practice in nursing education. For example, measurements at higher levels (behavior and results) are often hampered by methodological constraints, context variables besides difficulties to isolate the effects of education from other influencing factors in the health care settings ^(27, 28).

On the other hand, numerous studies addressed some limitations. For instance, some critics have observed that the framework presupposes a linear and causal connection among various levels, which could potentially oversimplify the intricate and iterative dynamics inherent in professional learning and development within the nursing discipline ^(1, 19). For example, Lee and Song have voiced criticism regarding the model's hierarchical structure, asserting that existing studies and empirical findings lack adequate substantiation to uphold the assumption of its hierarchical disposition ⁽⁹⁾. These findings go in the line with what had been reported by Yang et al and Miranda et al who stated that the reaction level of the model measures do not guarantee learning, behavior change, or improvement in patient outcomes; may be subject to social desirability bias; and often superficial respectively ^(29, 30).

Dwikurnaningsih, and Waruwu, concluded that the personal traits of trainees may significantly influence the degree of variation in training results, these traits incorporate demographic factors in terms of age, educational qualifications, and work experience ⁽³¹⁾. Interestingly, it had been observed that some authors argue that there has been minimal effort for improving the standards of nursing services and education, that could be

due to inadequate and disjointed involvement of who are responsible for improving the nursing services (24, 32).

Limitations

All the included studies were written in English, which may have led to relevant research being left out if it was in other languages. Also, most trials had methodological flaws such as lack of control groups, insufficient baseline data comparison, short follow-up and non-consideration of confounders that prevent firm conclusions on generalizability. However, significant limitations were also found. A significant quantity of literature reviewed expressed reservations about the weak psychometric development of instruments measuring behavioral and result-level outcomes that may also call into question the methodological strength evaluations have when they adhere to this model. Secondly, the framework was also considered to be too descriptive to account for how (learning) creates change, resulting in limiting the explanatory depth of the model. Although the use of the Kirkpatrick model in nursing education offers a practical, organized method to measure educational impact, the toolkit used to apply it in this setting must be strengthened with alternative models capable of measuring processes that are at work behind learning and behavior change.

Conclusion

Nurses can be forceful agents of change in healthcare, and our review demonstrates that Kirkpatrick model (which has been widely applied into studies to assess reaction, learning, behavior, and results) is appreciated for its clarity, flexibility and its capacity to establish a continuum between educational programs and

significant effects on clinical practice. Although a wide range of quantitative and qualitative methods were used across these four levels, the results draw attention to the importance of valid instruments for improving evaluation quality. Advantages of the model are its flexibility, its ease of implementation, and that it is consistent with competency-based standards that enable educators to evaluate not only satisfaction and knowledge but also behavior and outcomes. Multiple drawbacks were also identified, including reliance of self-reported questionnaires, lack of control and baseline measures for many studies as well as short follow-up time, and potential confounders such policy or resource differences. This study suggests the importance of providing motivation strategies, such as flexible work schedules and systems for active participation in research for nursing personnel, as well as implementing modern information technology and improving training to increase evaluation rigor and thus quality of nursing care.

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Conflict Of Interest

The authors declare no conflict of interest.

Data Availability

The data supporting the findings of this study are available from the corresponding author upon reasonable request.

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References

- Alsaibany RR. The evaluation of effectiveness on education and training program. *Journal of Educational and Learning Studies*. 2019;2(1):56.
- Jane Osareme O, Muonde M, Maduka CP, Olorunsogo TO, Omotayo O. Demographic shifts and healthcare: A review of aging populations and systemic challenges. *Int J Sci Res Arch*. 2024;11(1):383-95.
- Khan HT, Addo KM, Findlay H. Public health challenges and responses to the growing ageing populations. *Public health challenges*. 2024;3(3):e213.

- Organization WH. State of the world's nursing 2025: Investing in education, jobs, leadership and service delivery: World Health Organization; 2025.
- Heeneman S, Oudkerk Pool A, Schuwirth LW, van der Vleuten CP, Driessen EW. The impact of programmatic assessment on student learning: theory versus practice. *Medical education*. 2015;49(5):487-98.
- Schuwirth L, Van der Vleuten C, Durning S. What programmatic assessment in medical education can learn from healthcare. *Perspectives on Medical Education*. 2017;6(4):211-5.
- Almusaed A, Almssad A, Yitmen I, Homod RZ. Enhancing student engagement: Harnessing "AIED"'s power in hybrid education—A review analysis. *Education Sciences*. 2023;13(7):632.
- Deodhar M, Powdwal S. Impact of continuing education programs (CEPs) on LIS professionals in academic libraries in Mumbai, India. *Library management*. 2017;38(2/3):117-30.
- Lee H, Song Y. Kirkpatrick model evaluation of accelerated second-degree nursing programs: a scoping review. *Journal of Nursing Education*. 2021;60(5):265-71.
- Sherwood G, Barnsteiner J. *Quality and safety in nursing: A competency approach to improving outcomes*: John Wiley & Sons; 2021.
- Zainol Z, Tajuddin D. The effects of training transfer on training program evaluation and effectiveness of training program/Romi Rampun@ Ramlan, Zuraidah Zainol and Dewi Tajuddin. *Journal of Information and Knowledge Management (JIKM)*. 2021;11(1):65-77.
- Gertler PJ, Martinez S, Premand P, Rawlings LB, Vermeersch CM. *Impact evaluation in practice*: World Bank Publications; 2016.
- Grzeskowiak LE, Thomas AE, To J, Phillips AJ, Reeve E. Enhancing education activities for health care trainees and professionals using audience response systems: a systematic review. *Journal of Continuing Education in the Health Professions*. 2015;35(4):261-9.
- Van Der Vleuten CP, Schuwirth L, Driessen E, Govaerts M, Heeneman S. Twelve tips for programmatic assessment. *Medical teacher*. 2015;37(7):641-6.
- Huang X, Wang R, Chen J, Gao C, Wang B, Dong Y, et al. Kirkpatrick's evaluation of the effect of a nursing innovation team training for clinical nurses. *Journal of Nursing Management*. 2022;30(7):2165-75.
- Alsalamah A, Callinan C. Adaptation of Kirkpatrick's four-level model of training criteria to evaluate training programmes for head teachers. *Education Sciences*. 2021;11(3):116.
- Nguyen BT, Blizzard CL, Palmer A, Nguyen HT, Quyet TC, Tran V, et al. Using the Kirkpatrick Model to Evaluate the Effect of a Primary Trauma Care Course on Health Care Workers' Knowledge, Attitude, and Practice in Two Vietnamese Local Hospitals: Prospective Intervention Study. *JMIR Medical Education*. 2024;10(1):e47127.
- Jones C, Fraser J, Randall S. The evaluation of a home-based paediatric nursing service: concept and design development using the Kirkpatrick model. *Journal of Research in Nursing*. 2018;23(6):492-501.
- Cutting M, Goda Y, Suzuki K. Evaluation of pre-departure training for study abroad by adapting Kirkpatrick's model. *International Journal for Educational Media and Technology*. 2022;16(1):27-37.
- Pateda Sa, Badu Rw, Abd Hamid I, Rahmat A. Evaluation of the Kirkpatrick Model Program on Towards Class at the Gorontalo District. *JournalNX*. 2020;6(07):40-7.
- Elsheikh S, Magdy A, Asem L. Assessing infection control training in ICUs using the Kirkpatrick model: a prospective cohort study. *Antimicrobial Resistance & Infection Control*. 2025;14(1):65.
- Sudarmika P, Nurhaeni NLP, Agustini TF, Santyasa IW. Training Evaluation for Nurses and Midwives Using the Kirkpatrick Model: A Qualitative Descriptive Study. *International journal of health sciences*. 2023;7(2):53-66.
- Liu T, Ren Y, Wang X. Evaluation of the effectiveness of standardized training for new nurses using the Kirkpatrick model: An observational study. *Medicine*. 2025;104(23):e42504.
- Gandomkar R. Comparing Kirkpatrick's original and new model with CIPP evaluation model. *Journal of Advances in Medical Education & Professionalism*. 2018;6(2):94.
- Ambu-Saidi B, Fung C, Turner K, Lim A. A critical review on training evaluation models: a search for future agenda. *Journal of Cognitive Sciences and Human Development Vol*. 2024;10(1).
- Cordon C, Dlugosz D, Lopez L, Gelacio R, Smith-Eivemark K, Maier S, et al. Supporting Novice Nurses' Transition to Independent Practice: Evaluation of the TIPS Program Using the Kirkpatrick Model. *Nursing Reports*. 2025;15(2):50.
- Schut S, Driessen E, Van Tartwijk J, Van der Vleuten C, Heeneman S. Stakes in the eye of the beholder: an international study of learners' perceptions within programmatic assessment. *Medical Education*. 2018;52(6):654-63.
- Johnston S, Coyer FM, Nash R. Kirkpatrick's evaluation of simulation and debriefing in health care education: a systematic review. *Journal of Nursing Education*. 2018;57(7):393-8.
- Yang M, Zhang X, Han R, Ding X, Gao R, Jing Q, et al. Evaluation of the effectiveness of rehabilitation nursing training for clinical nurses based on the Kirkpatrick model. *BMC nursing*. 2025;24(1):374.

- Miranda FMd, Santos BVd, Kristman VL, Mininel VA. Uso de la metodología de Kirkpatrick para evaluar la formación de los profesionales de enfermería: una revisión integradora. *Revista Latino-Americana de Enfermagem*. 2025;33:e4431.
- Dwikurnaningsih Y, Waruwu M. Evaluation of the Effectiveness of Online Training to Improve Lecturers' Ability in E-Learning Management Using the Kirkpatrick Model. *Jurnal Pendidikan Progresif*. 2022;12(2):660-72.
- Reio Jr TG, Rocco TS, Smith DH, Chang E. A critique of Kirkpatrick's evaluation model. *New Horizons in Adult Education and Human Resource Development*. 2017;29(2):35-53.
- H. A. Improving the Effectiveness of Nurses' Teaching and Learning Methods Using Kirkpatrick's Model. Conference: 3rd International Conference on Nursing and Women's Healthcare 2024.