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Effectiveness of Human Resource Training Program Using Kirkpatrick in Supporting Quality and Patient Safety: Literature Review

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Abstract: *Human resource training is essential in healthcare organizations because healthcare workers' competencies directly influence service quality and patient safety. However, training effectiveness cannot be adequately assessed through attendance, participant satisfaction, or post-test scores alone. This study aims to analyze the application of the Kirkpatrick Model in evaluating human resource training programs in the healthcare sector, particularly in hospitals, and to identify factors influencing the transfer of learning to the workplace. This study employed an integrative literature review approach, drawing on Chapter 9, "Evaluation of Human Resource Training Programs," by Bisri (2024), and six scientific articles published between 2023 and 2026. The literature was analyzed descriptively and thematically based on the four levels of the Kirkpatrick Model. The findings indicate that Levels 1 (Reaction) and 2 (Learning) are relatively easier to implement, whereas Levels 3 (Behavior) and 4 (Results) require follow-up assessments, workplace observation, appropriate instruments, data triangulation, and organizational support. Evidence from the reviewed studies demonstrates improvements in healthcare workers' knowledge, attitudes, confidence, and practical skills. Nevertheless, learning outcomes do not automatically translate into behavioral changes or improved organizational performance. Training transfer is influenced by workload, standard operating procedures, available resources, supervisory support, and organizational culture. Therefore, hospitals should integrate training evaluation with quality improvement and patient safety systems using relevant and measurable indicators.*

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Introduction

Human resources are a strategic asset in a healthcare organization. Hospital services are highly dependent on the competence, skills, communication, decision-making, and behavior of healthcare workers. Therefore, human resource development is not merely an administrative function, but an integral part of the organization's strategy to maintain service quality and patient safety.

Training is a key instrument in competency development. Bisri (2024) defines training as an investment in human capital, expected to provide benefits in the form of increased knowledge and skills, performance, work quality, motivation, reduced errors, responsibility, and innovation. From this perspective, training costs are not viewed solely as operational costs, but as an investment whose benefits and contributions need to be assessed.

Problems arise when training evaluations focus solely on attendance, participant satisfaction, or post-tests. Participants may respond positively but not necessarily experience meaningful learning. Participants may acquire knowledge but not necessarily apply it in the workplace. Even behavioral changes may not necessarily result in changes in organizational outcomes, as service quality is also influenced by systems, leadership, workload, facilities, and policies.

The Kirkpatrick Model provides a framework for answering four evaluative questions: how participants responded to the training, what was learned, whether the learning outcomes were applied in the workplace, and whether relevant results for the organization occurred. In the development of the New World Kirkpatrick Model, attention was also expanded to relevance, engagement, confidence, commitment, required drivers, leading indicators, and desired outcomes (Kirkpatrick Partners, 2022).

Scientific evidence summarized in the source documents indicates that the Kirkpatrick Model remains relevant in the healthcare sector. Tinurbaya et al. (2023) showed that Level 2 is the most frequently used level, while Levels 3 and 4 are used less frequently due to limitations in time, funding, experience, and instruments. These findings are important for hospitals with limited resources, as evaluations need to be kept simple yet meaningful.

Javani et al.'s (2023) study provided local context by applying the Kirkpatrick Model to the evaluation of maternal-neonatal emergency training for midwives in Bali. Meanwhile, Nguyen et al.'s (2024) used a prospective pre-post intervention design with six-month follow-up among healthcare workers in two local Vietnamese hospitals. The study found high levels of satisfaction and improvements in knowledge, confidence, and practical skills, with some improvements sustained over six months. Level 4 was not assessed in that study.

In a more recent study, Miranda et al. (2025) conducted an integrative review of 13 nursing training evaluation studies, emphasizing that evaluation quality is greatly influenced by the selection of appropriate and reliable instruments at each level. Yang et al. (2025) used a mixed methods approach with 79 clinical nurses and demonstrated improvements in theoretical scores, operational skills, and abilities related to rehabilitation training. Baghcheghi and Koohestani (2026) used a quasi-experimental design with 69 nursing students to evaluate medication error prevention training and found improvements in knowledge, attitudes, and performance up to a four-month follow-up.

These findings suggest that training evaluation needs to shift from event evaluation to impact evaluation. In the context of hospital management, the more important question is not simply whether participants are satisfied, but whether the training results in competency, whether the competency is utilized in the workplace, and whether these changes contribute to quality and patient safety.

Literature Review Design

This manuscript uses an integrative literature review approach with narrative and thematic analysis. This approach was chosen because available sources include systematic reviews, integrative reviews, prospective intervention studies, mixed methods studies, quasi-experimental studies, and program evaluations. The purpose of the review is not to conduct a meta-analysis, but rather to integrate relevant findings to understand the use of the Kirkpatrick Model in the context of health coaching.

The primary source of the manuscript is Chapter 9, “Evaluation of Human Resource Training Programs” in the book Sustainable Human Resource Development by Bisri (2024). The enrichment uses six articles from the 2023–2026 period listed in the source document.

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Author/Year	Design/Focus	Population/Unit	Main findings
Tinurbaya et al. (2023)	Systematic review	Health training	Level 2 is most common; Levels 3–4 are less common.
Javani et al. (2023)	Kirkpatrick program evaluation	Midwife; Bali	Four levels are used; triangulation is relevant.
Nguyen et al. (2024)	Prospective pre-post intervention	80 health workers; 2 Vietnamese hospitals	Knowledge, confidence, and skills increase; some persist for 6 months.
Miranda et al. (2025)	Integrative review; 13 studies	Nursing training	Appropriate instruments are essential; Level 4 is the most challenging.
Yang et al. (2025)	Mixed methods; 79 nurses	Rehabilitation training	Theory and skills are enhanced; qualitative data explains the context.
Baghcheghi & Koohestani (2026)	Quasi-experimental; 69 nursing students	Medication error prevention	Knowledge, attitude, performance improved; 4-month follow-up.

Findings were analyzed thematically based on Kirkpatrick's four levels, then compared based on follow-up time, instrument, outcome type, and factors influencing learning transfer. The synthesis aimed to identify common patterns, differences between studies, evaluation limitations, and implications for hospital management.

It should be noted that these six articles are derived from readily available source documents. This manuscript does not claim to be a formal systematic review because the search database, search dates, complete search strings, initial article count, deduplication process, and PRISMA diagram are not fully documented. These components will need to be completed for formal publication.

Research methods

Research Design

This study employed an integrative literature review design with a descriptive-analytical approach. This design was chosen because the literature analyzed had diverse characteristics, including systematic reviews, integrative reviews, prospective pre-post intervention studies, mixed methods studies, quasi-experimental studies, and program evaluations. The integrative approach allowed researchers to combine quantitative and qualitative findings to obtain a more comprehensive picture of the effectiveness of evaluating health worker training using the Kirkpatrick Model.

Focus and Research Questions

The focus of this research is the application of the Kirkpatrick Model in evaluating human resource training programs in the health sector and its implications for learning, behavioral change, and organizational outcomes. The research questions used are: (1) how is the Kirkpatrick Model applied in evaluating health worker training; (2) what indicators are used at Levels 1 to 4; (3) what is the evidence of behavioral change and organizational outcomes after training; and (4) what factors influence the transfer of training outcomes to the workplace and the implementation of Level 3 and Level 4 evaluations.

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Data Sources and Literature

The research data is secondary data derived from scientific literature and academic documents that are available in the enrichment materials of Chapter 9. The main source is Chapter 9 “Evaluation of Human Resource Training Programs” in the book Sustainable Human Resource Development by Bisri (2024). The enrichment literature consists of six journal articles from the period 2023–2026, namely Tinurbaya et al. (2023), Javani et al. (2023), Nguyen et al. (2024), Miranda et al. (2025), Yang et al. (2025), and Baghcheghi and Koohestani (2026).

Literature Identification Strategy

Literature identification was directed at keywords relevant to the topic, namely "Kirkpatrick model", "training evaluation", "healthcare workers", "hospital training", "training effectiveness", "patient safety", and "medication error". The available literature was then mapped based on the study design, population, type of training, Kirkpatrick level evaluated, instrument, follow-up time, and outcome. Because this manuscript was developed based on a collection of literature already available in the source document, the search strategy has not been fully documented in the form of databases, search dates, complete search strings, number of initial articles, deduplication process, and PRISMA diagram. Therefore, this study is positioned as an integrative literature review and not a formal systematic review.

Inclusion and Exclusion Criteria

The inclusion criteria used in selecting the literature included: (1) publications from 2023–2026; (2) discussing the evaluation of health worker training programs or education/training relevant to health services; (3) using or discussing the Kirkpatrick Model as an evaluation framework; (4) containing information on design, population, intervention/training, or outcomes that could be analyzed; and (5) relating to service quality, health worker competency, patient safety, or organizational performance. Exclusion criteria included non-health articles, editorials or opinion pieces that did not provide evaluation data, duplications, and publications that did not contain information relevant to the research question.

Literature Selection Process

The selection process was carried out in stages, assessing the suitability of the article's title and focus to the review objectives, then assessing the methodological information and results available in the articles. Articles that met the topic's relevance were retained for synthesis. The six articles listed in the source documents were then used as the primary unit of analysis. Because the initial number of articles and the deduplication process were not documented in the available sources, this study does not report the number of articles screened at each stage, as in a PRISMA-based systematic review.

Data Extraction

Data from each article were extracted using an analysis matrix that included: author and year of publication, study design, population or unit of analysis, type of training program, training objectives, Kirkpatrick level evaluated, measurement method or instrument, measurement or follow-up time, primary outcome, and factors that support or hinder learning transfer. Extraction was performed to facilitate comparisons between studies and identify patterns in findings.

Data Analysis and Synthesis

The analysis was conducted descriptively and thematically. Findings were grouped according to the four levels of Kirkpatrick's Model: Reaction, Learning, Behavior, and Results. Cross-study comparisons were conducted based on instrument type, follow-up time, outcome type, and factors influencing learning transfer. The synthesis aimed to identify common patterns, differences in outcomes, evaluation gaps, Level 3 and Level 4 measurement challenges, and implications for hospital management. Findings from studies with different designs were not statistically combined due to heterogeneity in design, population, intervention, and outcome.

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Assessment of Limited Evidence

The quality and interpretability of the findings were assessed based on the study design, clarity of measurement methods, availability of follow-up, and the appropriateness of the indicators to the Kirkpatrick levels assessed. However, this manuscript did not use a standardized risk of bias assessment instrument and did not conduct a meta-analysis. Therefore, the synthesis results are used primarily to generate conceptual understanding and managerial implications, not to generate pooled effect estimates.

Component	Information
Design	Integrative literature review; descriptive-analytical
Data	Secondary data from book Chapter 9 and 6 journal articles (2023–2026)
Unit of analysis	A study evaluating health worker training using the Kirkpatrick Model
Extraction	Author/year, design, population, training, Kirkpatrick level, instrument, follow-up, outcome
Synthesis	Descriptive and thematic analysis based on Levels 1–4 and transfer factors
Meta-analysis	Not conducted due to study heterogeneity and data limitations

Results and Discussion

Results

Six articles demonstrate a variety of research designs and depth of evaluation. Tinurbaya et al.'s (2023) systematic review provides an overview of the use of the Kirkpatrick Model in healthcare training. Javani et al.'s (2023) contextual evidence from Bali. Nguyen et al.'s (2024) demonstrate the benefits of mid-term follow-up. Miranda et al.'s (2025) synthesize nursing training, while Yang et al.'s (2025) reinforce the use of mixed methods. Baghcheghi and Koohestani's (2026) provide a specific example of medication errors, with measurements of performance and safety outcomes.

1. **Level 1: Reaction**

   Level 1 assesses participant response to the training. Relevant indicators include satisfaction, relevance of the material, engagement, perceived usefulness, facilitator quality, and appropriateness of the method. Literature suggests that a positive response is an important initial indicator, but not sufficient to conclude program effectiveness.

   From Kirkpatrick's New World perspective, reaction evaluation should not simply ask whether participants are satisfied. Relevance and engagement are crucial because healthcare participants work in high-service environments. Training that is relevant to the unit's problems is more likely to be retained and implemented.

2. **Level 2: Learning**

   Level 2 is the most frequently used level. Measurements can include pre- and post-tests, skill demonstrations, simulations, and assessments of attitude, confidence, and commitment. Tinurbaya et al. (2023) demonstrated the dominance of Level 2 in the health training evaluation literature.

   Nguyen et al. (2024) demonstrated increased knowledge, confidence, and practical skills after a Primary Trauma Care course. Baghcheghi and Koohestani (2026) demonstrated improved knowledge and attitudes during medication error prevention training. Yang et al.'s (2025) findings also demonstrated improved theoretical abilities and operational skills in clinical nurses.

3. **Level 3: Behavior**

   Level 3 assesses the transfer of learning outcomes to the workplace. This level is crucial because an increase in post-test scores cannot be used as evidence of a change in work behavior.

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Assessment can be conducted through observation, audits, checklists, supervisor assessments, interviews, and repeated measurements.

Nguyen et al. (2024) showed that follow-up of up to six months can be used to assess the sustainability of changes. The study in the source document also emphasized that the work environment, supervisor support, standard operating procedures (SOPs), workload, tool availability, and organizational culture can be required drivers or barriers to transfer.

4. Level 4: Results

Level 4 assesses the program's impact on the organization. In hospitals, indicators don't have to be limited to profit. Outcomes can include patient safety, medication errors, process compliance, documentation quality, patient complaints, productivity, efficiency, and other quality indicators.

Miranda et al. (2025) identified Level 4 as the most challenging. Baghcheghi and Koohestani (2026) provided an example that medication safety evaluation can extend to performance and error/near-miss monitoring. However, changes in outcomes must still be interpreted with caution as they may be influenced by factors beyond training.

5. Factors Influencing Learning Transfer

Factor	Role in Transfer
Superior support	Provide coaching, feedback, and behavioral reinforcement.
SOP and work system	Determine whether new behavior can be implemented consistently.
Workload	Can be a barrier to the implementation of new competencies.
Facilities and job aid	Supports the application of knowledge in real situations.
Organizational culture	Influences openness to change and reporting.
Monitoring and auditing	Provide feedback and maintain behavior change.

Discussion

Synthesis shows that the Kirkpatrick Model's primary strength is its simplicity. The model provides a structure that can be communicated to management and allows for logical relationships between learning experiences, competencies, behaviors, and outcomes. For hospitals, this framework helps shift the evaluation question from "was the training implemented?" to "what contribution did the training make to organizational goals?"

However, the model should not be treated as an automatic causal chain. High satisfaction does not guarantee learning; learning does not guarantee behavior; and behavior does not always result in changes in outcomes. Therefore, each level needs appropriate indicators and instruments.

The gap between learning and behavior is a major issue. Participants may master the material in class, but workplace conditions can hinder its implementation. In healthcare, barriers can include staff shortages, patient load, interruptions, limited equipment, inadequate SOPs, or lack of supervisory support.

Therefore, a Level 3 evaluation should be viewed as an evaluation of the interaction between the individual and the work system. If Level 2 is high but Level 3 is low, management should not immediately repeat the training. The evaluator should first explore work environment barriers.

1. The Importance of Follow-up

Follow-up is a consistent pattern in the literature. Nguyen et al. (2024) conducted a six-month follow-up, while Baghcheghi and Koohestani (2026) used a four-month follow-up. This evidence supports the principle that behavioral change is not appropriately assessed solely on the day of training.

For hospitals with limited resources, follow-up doesn't have to be complex. Brief audits, checklists, coaching unit heads, and routine data usage can provide more meaningful information than adding numerous administrative tools.

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Miranda et al. (2025) emphasize the importance of appropriate instruments for each level. A single questionnaire cannot be used to validly measure satisfaction, learning, behavior, and results. A more robust evaluation combines questionnaires, pre-post tests, simulations, observations, supervisor assessments, and objective data.

Triangulation can also reduce self-report bias. Participants' perceptions can be compared with supervisor observations and service indicators. A mixed methods approach, such as that in Yang et al. (2025), provides additional context regarding why change occurred or did not occur.

2. Relevance for Class D Hospitals

The source document classifies Bali Holistik Hospital as a Class D general hospital with 24-hour emergency services, outpatient services, inpatient services, delivery rooms, operating rooms, a laboratory, radiology, ultrasound, and a pharmacy. In the context of more limited resources, the evaluation design needed to be simple, utilize routine data, and not disrupt continuity of care.

The most relevant principle is "few but meaningful indicators." Hospitals do not have to measure every indicator in every training. Indicators are selected based on program objectives and service risks.

As an example of conceptual implementation, the source document proposes medication administration safety and medication error prevention training for nurses. Evaluation begins with Level 4 outcomes, namely improvements in medication administration safety and a reduction in validated medication administration errors. From these outcomes, critical behaviors are derived, such as patient identification, medication verification, double-checking of required conditions, documentation, and reporting of near-misses.

Level	Focus	Example of indicators	Time
1 Reaction	Relevance, engagement, satisfaction	Relevance ≥4.2/5; satisfaction ≥85%*	Immediately after training
2 Learning	Knowledge and skills	Improvement of ≥20 percentage points or post-test ≥80%; simulation ≥85%*	Before after
3 Behavior	Implementation in the workplace	Critical behavior compliance ≥90%*	Week 4 & 12
4 Results	Quality and safety	Validated errors decrease; near-miss indicators are interpreted in conjunction with a reporting culture	3-month baseline vs. 3-month follow-up

*The target is an academic/simulation target from the source document and not actual data from Bali Holistic Hospital.

Based on the synthesis, the conceptual model that can be used is: Training Program → Reaction → Learning → Behavior/Transfer → Quality and Patient Safety → Organizational Performance. This relationship is influenced by contextual factors such as leadership support, work environment, SOPs, workload, resources, organizational culture, and monitoring.

The model demonstrates that training is one intervention within an organizational system, not the sole determinant of outcomes. Therefore, evaluation should be used to determine whether the problem lies with the training design or the work environment.

Managerial Implications

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Human resource management needs to integrate training evaluation into the planning, implementation, and competency development cycle. Each program should have objectives, indicators, baselines, measurement methods, and a follow-up plan.

Quality and patient safety indicators can be utilized as Level 4 indicators so that training evaluations don't create new administrative systems. Data from quality audits, safety incidents, pharmaceuticals, medical records, and patient complaints can serve as sources for evaluation.

Evaluation results can be used to determine whether to continue, modify, expand, or terminate a program. ROI can be used selectively, but decisions should not be based solely on financial benefits. In hospitals, quality and safety outcomes are a critical component of the value of training investments.

1. Implementation Recommendations

A. Make training evaluation a mandatory part of the training cycle.
B. Establish evaluation indicators before training begins.
C. Using routine hospital data for Level 4.
D. Conduct a minimum of one to three month follow-up for training that targets behavioral change.
E. Involving unit heads in coaching and monitoring.
F. Using triangulation of participants, superiors, audits, and objective data.
G. Developed Kirkpatrick templates that can be used across programs.

Limitations

This manuscript has limitations because the six articles analyzed were derived from readily available source documents. This paper cannot yet be considered a formal systematic review because the search database, search date, search string, number of initial articles, deduplication, study quality assessment, and PRISMA diagram have not been fully documented.

Furthermore, heterogeneity in design, population, training type, instruments, and outcomes limits direct comparisons between studies. Therefore, the synthesis in this manuscript is narrative and thematic.

Conclusion

This literature review demonstrates that the Kirkpatrick Model is a relevant framework for evaluating human resource training programs in the healthcare sector. The model allows evaluation to move from participant responses and learning to behavioral transfer and organizational outcomes.

Levels 1 and 2 are relatively easy to implement, while Levels 3 and 4 require consistent follow-up, observation, organizational support, triangulation, and outcome indicators. The literature shows that increased knowledge and skills do not automatically result in behavioral changes because transfer is influenced by work environment conditions.

For hospital management, training evaluation should begin with the desired outcomes and then scale down to critical behaviors, competencies, and learning experiences. Evaluation should be integrated with quality and patient safety systems so that human resource development investments can be assessed based on their contribution to organizational performance. In hospitals with limited resources, a simple approach, integrated with routine data, and using a few meaningful indicators is a more realistic option.

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