

Program Evaluation: Nursing Informatics Structured Training Program

Ali M. Al Yasin, RN, MSN^{1*}, Dr. Abdulmajeed Al Shehah², Shini Cherian, RN, MSN¹, Margaret Elizabeth Aitchison, RN, MSC¹

¹General Nursing Administration, Security Forces Hospital Program-Riyadh, Saudi Arabia

²Assistant Director General for Medical Operations, Security Forces Hospital Program-Riyadh, Saudi Arabia

DOI: [10.36348/sjnhc.2023.v06i07.002](https://doi.org/10.36348/sjnhc.2023.v06i07.002)

| Received: 29.05.2023 | Accepted: 05.07.2023 | Published: 11.07.2023

*Corresponding author: Ali M. Al Yasin

General Nursing Administration, Security Forces Hospital Program-Riyadh, Saudi Arabia

Abstract

In today's healthcare system, informatics has become an essential part of the infrastructure to improve access to health information, make patient care safer, decrease health care costs, and improve outcomes. The evaluation of these services is an important component of these programs and health professionals should have the requisite knowledge, confidence, and skills to evaluate the impact of the services they provide. However, Nursing staff are seldom adequately prepared by their training or work experience to do this well. In this article the researchers provide a suitable framework and guidance to enable nursing staff to appropriately undertake useful program evaluation. We introduced and discussed Program Evaluation and provided guidelines for its implementation. The framework presented distinguishes program evaluation from research and encourages nursing staff to apply an evaluative judgment, in order that value the merit, worth, and significance of programs can be made. Examples from our evaluation practice are drawn on to illustrate how program evaluation can be used across the Nursing care scope.

Keywords: Program Evaluation, Nursing Informatics, Health Care System.

Copyright © 2023 The Author(s): This is an open-access article distributed under the terms of the Creative Commons Attribution **4.0 International License (CC BY-NC 4.0)** which permits unrestricted use, distribution, and reproduction in any medium for non-commercial use provided the original author and source are credited.

INTRODUCTION

A program can be defined as “any set of organized activities supported by a set of resources to achieve a specific and intended result.” Healthcare programs are considered to be any structured healthcare action which can be measured (obtain a value, number and grade) during the program evaluation. The following are examples of healthcare programs (Anon, 2019; CDC, 2016):

- **Direct Service Interventions** (school health services and outpatients' care)
- **Community Mobilization Efforts** (healthcare charities and non-profit donors)
- **Research Initiatives** (efforts to improve the healthcare outcomes)
- **Advocacy Work** (campaigns and homecare consultations)
- **Training programs** (staff training programs to enhance good work achievement and decrease unemployment)

Evaluation is “the process of determining the merit, worth, and value of things, and evaluations are the products of that process” (Scriven, M. 1991). Program Evaluation is “the systematic collection of

information about the activities, characteristics, and outcomes of a program to make judgments about the program, improve program effectiveness, and/or inform decisions about future program development.” Program evaluation is different from routine assessment, because it is implemented according to a set of criteria, standards and guidelines. It should be purposeful, meaningful, ethically considered, applied, feasible, valid, accurate, and use the available resources and policies (Anon, 2019; CDC, 2016a).

The program evaluation framework directs the healthcare professionals in their practice of the program evaluation. Such framework includes certain steps, standards, and criteria of measurements for successful program evaluation. When the nurse managers accurately use the standards of the program evaluation framework, it helps them to understand the program's context and its evaluation success (DeGroff *et al.*, 2010).

Framework for Program Evaluation

The Centers for Disease Control and prevention (CDC) developed a framework that encompasses 6 steps in program evaluation and 4 group

standards (utility, feasibility, propriety and accuracy) as

seen in Figure 1.



Figure 1: CDC Framework for Program Evaluation
 (<https://www.cdc.gov/evaluation/guide/introduction/index.htm>)

This framework provides a practical tool that summarizes in a logical order the essential elements of a Program Evaluation.

Applying Program Evaluation to a Structured Training Program

Step 1: Engage stakeholders, including those involved in program operations; those served or

affected by the program; and primary users of the evaluation.

Engagement of stakeholders is important for addressing training program objectives and operations. The following stakeholders were identified, including the role of each stakeholder (Table1):

Table 1: Stakeholders and Involvement

Stakeholder	Role of the Stakeholder
• Program Coordinator	• Co-ordinated the Structured Training Program
• Nursing Administration and Program Director	• Nursing Admin staff help to arrange the schedule of the nursing staff for practical sections.
• Nursing Educators and Training Division	• Organized the Training Lectures
• Trainers-Champions and Super-Users	• Responsible for training all the participants
• Information Technology Staff	• Provision of Computers, User Access, Troubleshooting etc.
• Clinical Staff	• Learn the Program and apply it to nursing care, identify problems
• Patients	• Give feedback on Nursing Care
• Policymakers	• Ensuring policy and procedures are in place to ensure staff follow correct documentation procedure
• Sponsors	• Ensure adequate finance

Step 2: Describe the program, including the need, expected effects, activities, resources, stage, and context and logic model.

Need and Context

Nursing informatics helps to improve vital nursing processes like documentation, which is an important aspect of the profession and essential for

effective patient care. Before electronic health records, nurses recorded patient information on charts which could easily be mismanaged. Today, nursing informatics simplifies documentation and automates the transmission of patient data via connected devices to provide access by nurses, physicians, and patients.

Nurse' informatics competence affects the quality of healthcare (Darvish *et al.*, 2014)

To ensure competency a structured training program was implemented. A Structured Training Program is defined as a "detailed schedule, time frame, outline of activities, and assignment of responsibilities. It has well defined goals and consequences. Having a structured training program typically leads to more success and employee development than an informal or unstructured one." Structured training represents a systematic approach to training.

Expected Effects:

The expected benefits from a successful Structured Training Program are:

- Nurses demonstrating increased knowledge, practice skills and confidence when using nursing informatics system.
- Improved Quality of Care for the Patients

Activities

Our *Structured Training Program* in nursing informatics documentation system was provided in the form of scheduled lectures and hands-on practical sessions provided to all nursing staff over a 5 month period from May to September 2022. Training venues were set up with champions and super users to do bulk training prior to going live and were available for several weeks after going live as support for all staff.

Resources

A feasibility study was performed to ensure sufficient resources including:

- Infrastructure (facilities, up-to-date servers, training manuals, computers, and equipment)
- Trainers/Champions/Super-Users
- Information Technology Staff
- Safe Working Environment (chairs, tables, Air conditioning, lights, snacks etc.)
- Finances

Lack of availability in the above resources risked ineffective implementation of the training program.

Stages of the Training Program (3 stages); Planning, Implementation and Evaluation

i) Planning: The organisers had to determine the training needs of the nurses and prepare all needed facilities and resources. A day-to-day schedule of operations was made. A roadmap was made for the future, which included any potential challenges that may impact the goals and how managing any challenges would be accomplished.

ii) Implementation: This Structured Training Program involved one group that completed a pre-test, was exposed to a Structured Training Program and then completed a post-test. From May to September the trainers conducted one to one interview with the selected staff and conducted a pretest. After that they started to train the staff in the form of structured lectures and practical sessions (Structured Training Program). After each module the staff had to attend a post test.

iii) Evaluation: Evaluation is an important aspect of any project outcome. When reviewing any project implementation, it is important to establish any mitigating unplanned or negative events that may impact on future service provision.

In evaluation there were many variables to consider, and the design of an evaluation questionnaire covering the variables of Donabedian structure, process, outcome and evaluation was established and sent to stakeholders, for their opinion on pre, intra and post project objectives:

Review of multidisciplinary respondents to evaluation questionnaire.

- Assessing whether training, change management, was supported.
- Assessing how the project was managed.
- Assessing whether the informatics system improved the communication between health care facilities.
- Assessing whether data was protected.
- Assessing whether information could be used for audit or research purposes.

There was some training and user issues as some users did not have enough computer skills necessary to navigate through the system.

The Donabedian model-1966 is a conceptual model that provides a framework for examining health services and evaluating quality of health care.

To assess the quality of care for boarded patients, we used the "structure-process-outcome" framework described by Donabedian. This three-part approach makes quality assessment possible assuming structure (e.g. attributes of material or human resources and organizational structure) influences process (what is actually done in giving and receiving STP), which influences outcome (e.g. Nursing documentation) (Liu *et al.*, 2013).

The diagram is formed after the evaluation of user questionnaire results.

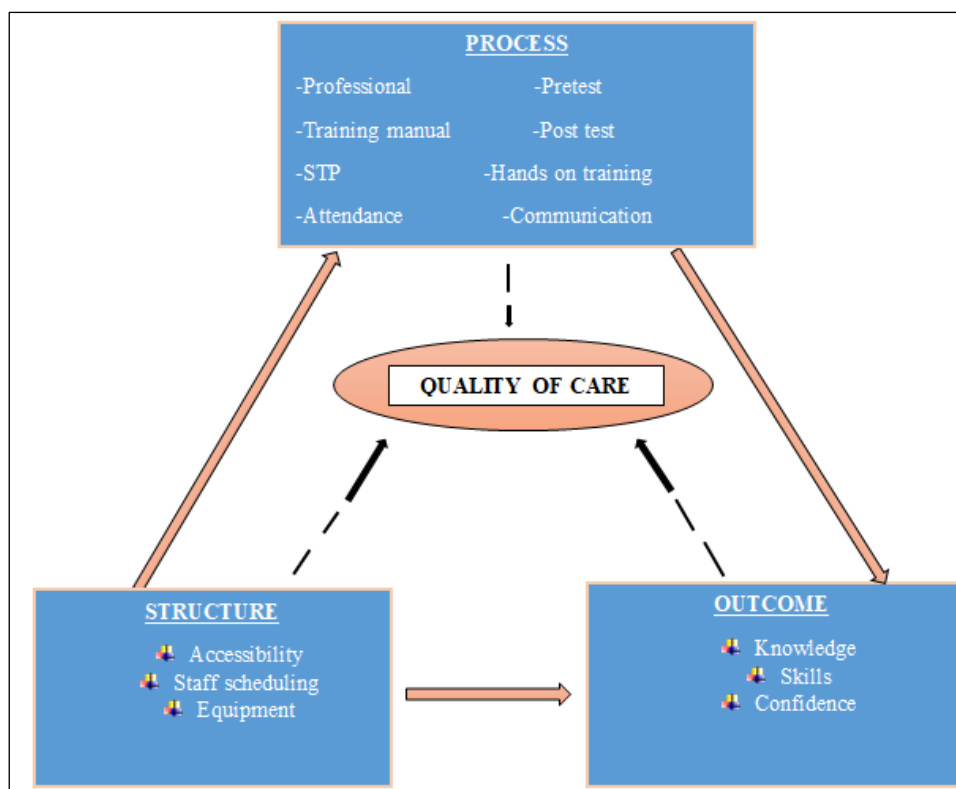


Figure 2: Donabedian model-1966

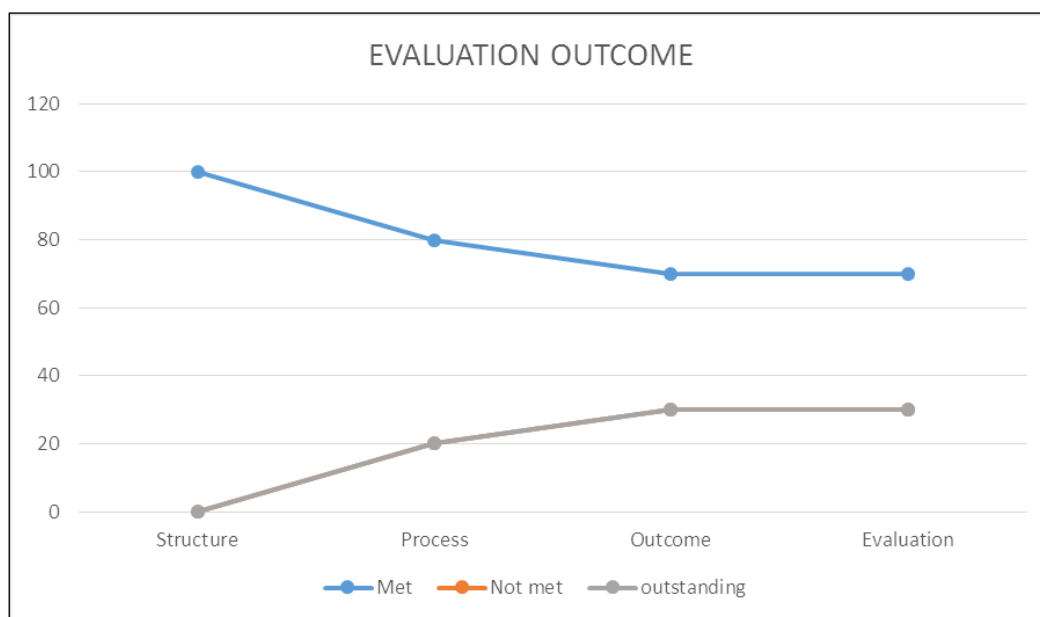


Figure 3: Evaluation Outcome

Logic Model:

Logic models are a fundamental tool for evaluators using a theory-driven approach (Bauman & Nutbeam, 2014; Renger *et al.*, 2019). The development of the model helps to set the boundaries of the project, program, strategy, initiative, or policy to be evaluated (Bamberger & Mabry, 2020; Davidson, 2005). Logic

models represent stakeholders' views of how and why a program will work. When developing the model, it is therefore beneficial to include a wide range of stakeholder input. The following is an example of using a logical model for Structured Training Program for nursing Informatics.

<u>Analysis</u>	<u>Design</u>	<u>Development</u>	<u>Implement</u>	<u>Evaluate</u>
<ul style="list-style-type: none"> ❖ Assess needs ❖ Determine Goals ❖ Review the program ❖ Define Gaps ❖ Identify Audience ❖ Define content ❖ Define modes of delivery 	<ul style="list-style-type: none"> ❖ Identify Objectives ❖ Learning maps ❖ Outline content ❖ Define Blackboards ❖ Create Strategies ❖ Identify Interactions ❖ Develop Assignments 	<ul style="list-style-type: none"> ❖ Create Training Environment ❖ Create lecture and practical sections ❖ Create tools ❖ Create tests and assignments ❖ Feedback process 	<ul style="list-style-type: none"> ❖ Deliver materials ❖ Conduct pretest ❖ Conduct training ❖ Conduct Practical sections 	<ul style="list-style-type: none"> ❖ Goals Achieved ❖ Conduct Assessment ❖ Review Effectiveness ❖ Define Improvements ❖ Follow up

Figure 4: ADDIE (Analyse, Design, Develop, Implement and Evaluate Model for Training)

In this article, the authors examine how they used the ADDIE instructional design framework used to train nursing informatics system. The authors used the phases of analysis, design, development, implementation, and evaluation to integrate current structured training programs.

Step 3: Focus the evaluation design to assess the issues of greatest concern to stakeholders while using time and resources as efficiently as possible. Consider the purpose, users, uses, questions, methods and agreements.

Evaluation Design:

Structured teaching modules and practical sections were conducted for all the nursing staff Data was collected using a pre and post-test of each module to assess the knowledge level of the samples, an observation practice checklist to assess the practice/skills, a Likert scale to assess confidence level and a final evaluation through surveys to evaluate the effectiveness of the Structured Training Program. A course evaluation was requested after completion of the training. An audit was done following the implementation of the system to check nursing staff satisfaction.

Purpose

The main purpose of the Structured Training Program was to ensure increased knowledge, skills and confidence in the nurses’ in nursing informatics, ensuring nurse competency in nursing informatics and thus improved the quality of care provided.

The purpose of the Program Evaluation was to identify any problems/challenges encountered in the Training Program, thus allowing the program to be tailored or changed accordingly e.g. for example providing written materials if verbal instructions were not understood or remembered.

It was decided that the data collected from the evaluation and the audit would serve as a baseline for later evaluations and refresher Informatics Training Programs.

Users/Uses

Users are the individuals who will receive the findings of the program evaluation. They can be the policy makers, stakeholders, researchers and hospital managers.

Evaluation Questions

Although the evaluation team generated many possible questions in a brainstorming session, the evaluation team prioritized the following as representing the most important aspects of the program that could be examined at this time.

To determine if the program had been implemented as planned:

- ❖ Has appropriate training staff been selected and followed the criteria for selection?
- ❖ Has the nursing staff (all program employees) been trained appropriately (in knowledge and skills and competency)?
- ❖ How do you rate the electronic system versus manual system?

To determine if the program is meeting its objectives:

- ❖ Course content was organized and well planned
- ❖ Course workload was appropriate
- ❖ Course organized to allow all students to participate fully
- ❖ Practical section was adequate

Agreement

The evaluation team agreed that the evaluation data was useful, and feasible to collect. Propriety was addressed through ensuring confidentiality of test results. While the group agreed that there may be some issues regarding record keeping or staff willingness to answer the evaluation honestly, the accuracy of the strategy was judged to be acceptable.

Step 4: Gather credible evidence to strengthen evaluation judgments and the recommendations that follow. These aspects of evidence gathering typically

affect perceptions of credibility: indicators, sources, quality, quantity and logistics.

Indicators

The evaluation team recognized that the different tools used for data collection of and the following list of indicators show the team's decisions. Since several program objectives were vague, the evaluation team had to determine benchmarks that seemed reasonable, given the limited information available. Each member of the evaluation team informally talked with other stakeholders to ensure consensus (Table 2).

Table 2

Indicators	Program Benchmarks
Has appropriate training staff been selected and followed the criteria for selection?	
<ul style="list-style-type: none"> Number of training staff selected for the training Program 	<ul style="list-style-type: none"> 20 Champions and Super-Users were selected Based on their performance in their posttest.
Has the staff been trained appropriately (in knowledge, skills and competency)?	
<ul style="list-style-type: none"> Staff received appropriate/adequate training Staff received appropriate practical hours 	<ul style="list-style-type: none"> All nursing staff attended the training program Training covered essential topics
Course content was organized and well planned	
<ul style="list-style-type: none"> Nursing education and training division organized lecture and practical sections. Followed Clinical standards Training modules available in their hospital intranet and distributed training manuals Nursing Admin staff help to arrange the schedule of the nursing staff for practical sections for unit specific training. 	<ul style="list-style-type: none"> Training sections arranged like different modules. Each module with pretest and posttest and discussion sections arranged. Clinical standards met Training modules include PowerPoint presentations, reading materials and videos are prepared. Staff knows how to access and use electronic datasheets
Course workload was appropriate	
<ul style="list-style-type: none"> Attendance at program maintained Pre scheduled Created nursing informatics training environment and used as instructional media Conducted online survey for pretest and post test Arranged 2champions, 2 super-users and 2 training venue for practical sections. 	<ul style="list-style-type: none"> 100% of participants participated in the training program; Nursing documentation audit
Course organized to allow all students to participate fully	
<ul style="list-style-type: none"> Nursing Admin given prior notification to the staff through email about the training program Scheduled the agenda prior to the program and emailed to the participants. Created training environment and used as instructional media Conducted online survey for pretest and post test Arranged 2champions, 2 super-users and 2 training venue for practical sections. 	<ul style="list-style-type: none"> Email notification to all the staff Participant's list and program agenda prepared. Telegram group as instructional media. Google survey forms.
Practical section was adequate	
<ul style="list-style-type: none"> Arranged 2champions, 2 super-users and 2 training venue for practical sections. Adequate time provided for hands on practice Given positive feedback Continues supervision and follow up done 	<ul style="list-style-type: none"> Arranged duty schedule Provided facilities for practice Direct observation from nursing admin and nursing education team Nursing documentation audit

Data Collection

The evaluation utilizes several methods of data collection in various ways: interview, test, observation checklist and survey. Google survey was administered to the staff to assess the pre and posttest knowledge level and to assess satisfaction after the implementation,

observation checklist was used to assess skills and Likert scale was used to assess confidence.

Table 3 summarizes the data source and data collection methodology used to gather evidence for evaluation.

Table 3: Data Collection Plan

Indicators	Data source	Data Collection Method
Number of staff for Structured Training Program	<ul style="list-style-type: none"> Nursing Roster Nursing Matrix Attendance Sheet 	<ul style="list-style-type: none"> Observe presence of staff Review records if staff not present
Nursing Administration conducted training, interviewing and data collection Competency Assessment	<ul style="list-style-type: none"> Training attendance records Competency assessment sheet Pre and posttest answer sheets 	<ul style="list-style-type: none"> Review records of training sessions and attendance, materials presented
Needs Assessment Survey Clinical standards Training sections to improve knowledge and hands on practical sections Staffs perception about the training program Regular follow-up	<ul style="list-style-type: none"> Clinic records, interviews with staff Staff knowledge, skills and behaviors Staff perceptions Survey and Documentation Audit 	<ul style="list-style-type: none"> Review records, notes in system, ask staff to identify the training needs Exams Observation Documentation audit Program evaluation/observations Survey forms Review records, notes in file, ask staff to identify the training needs and make discussion sections to clarify the doubts

Plan Timeline

Table 4: Illustrative Timeline for Evaluation Activities

Evaluation Activities	Timing of Activities for May – Sept				
	May	June	July	August	September
Evaluation planning	+	+	+	+	+
Data collection	+	+	+	+	+
Analysis/interpretation		+	+	+	+
Report/dissemination					+

Step 5: Justify conclusions by linking them to the evidence gathered and judging them against agreed-upon values or standards set by the stakeholders. Justify conclusions on the basis of evidence using these five elements: standards, analysis/synthesis, interpretation, judgment and recommendations.

Analysis

Both quantitative and qualitative methods were used to analyze the data. Simple counts of frequency were used for quantitative data analysis. Qualitative methods such as content analysis were used to review training curriculum, pre and posttest results, observation (practice) checklist, Likert Scale and Nurse Records and patterns.

Interpretation

Stakeholders including the Nursing Administrator, Program Coordinator and NED team

were included in a scheduled meeting to interpret the findings. The data from the evaluation was compared to the established program benchmarks. Stakeholders and those involved in program operations will be given an opportunity to justify the findings and make recommendations accordingly.

Step 6: Ensure use and share lessons learned with these steps: design, preparation, feedback, follow-up and dissemination. For additional details.

Feedback

Follow up was done through documentation audit and direct observation. Feedback was received through satisfaction survey

Dissemination

Evaluation finding were disseminated via various channels. Presentations were given at the program staff meeting and in a Nursing Conference. A

short report will be drafted and submitted to Nursing Administration. A nursing research study will also be

conducted on this program.

Table 5: Dissemination Plan

Yes ✓	Dissemination Medium	Responsible Person
	Presentations at staff meeting	Program coordinator
	Report and briefing to Nursing Administration	Program coordinator and team
	Research project	Program director and team

Use

The program director, and staff will use the findings to refine program strategies for Structured Training Programs. The findings will help guide the program to focus on areas that are most crucial for effective service delivery. Nursing education, will use the findings to determine the future improvement of the program and creating the competency. Finally, findings from this evaluation will be used for future evaluations and for improvements in refresher training.

CONCLUSION

Proper training is vital to the success of the nurse and unit. When trained, job satisfaction increases. Satisfied staff equates to decreased turnover rates. Beyond job satisfaction for the nurse, a comprehensive orientation program includes improved job performance, and ability to cope with stress. Findings from this study suggest that a structured training program increases the knowledge confidence and skills of nurses, thus ensuring nurse competence in nursing Informatics, thus improving quality of patient care. The positive feedback from the survey deemed the training program a success.

Acknowledgments

We acknowledge colleagues who were involved in the development of the Program Evaluation framework and those who led or contributed to the evaluation projects referenced in this article. Special thanks to **Ms. Deirdre Hawkins** and **Ms. Manal Al Essa**, (Nursing Education and Training Division), without the assistance of these people, this program evaluation would never have existed.

Funding

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

Author Contributions

All authors contributed substantially to the conception and design of this work as well as the helped to draft and revise the manuscript. All authors approved the final version to be published and are accountable for all aspects of this work.

Conflict of Interest Statement: None declared.

REFERENCES

- Adams, J., & Neville, S. (2020). Program Evaluation for Health Professionals: What It Is, What It Isn't and How to Do It. *International Journal of Qualitative Methods*, 19. <https://doi.org/10.1177/1609406920964345>
- American Nurses Association (2015). *Nursing informatics: Scope and standards of practice* (2nd ed.). Silver Spring, Maryland: American Nurses Association.
- Anon, (2019). Framework for Program Evaluation – CDC. Available at: <https://www.cdc.gov/eval/framework/index.htm>
- Aydin, A., Gürsoy, A. & Karal, H. (2023). Mobile care app development process: using the ADDIE model to manage symptoms after breast cancer surgery (step 1).14, 63. <https://doi.org/10.1007/s12672-023-00676-5>
- Banandur, S. P., Sukumar, G. M., Arelingaiah, M., Garady, L., Koujageri, J. M., Sajjanar, S. L., Hadapad, B., Ramesh, M. S., & Gopalkrishna, G. (2020). Effectiveness of a Structured Training Module on Different Learning Domains among Yuva Parivarthakas under Yuva Spandana Program. *Indian journal of psychological medicine*, 42(2), 182–188. https://doi.org/10.4103/IJPSYM.IJPSYM_144_19
- Bauman, A., & Nutbeam, D. (2014). Planning and evaluating population interventions to reduce noncommunicable disease risk - reconciling complexity and scientific rigour?. *Public health research & practice*, 25(1), e2511402. <https://doi.org/10.17061/phrp2511402>
- Cherian, S., Mary, V., Hawkins, D., Hamed, Y., & Yasein, A. (2023). *A Charge Nurse Development Program: Evaluation of Its Effectiveness Adapting Evidence-Based ADDIE Model*. *Nursing Centered Editorial Staff Sigma Theta Tau International*.
- Clark, D. (2015). Why Instructional System Design and ADDIE? *Instructional System Design: The ADDIE Model: A Handbook for Learning Designers*. <http://knowledgejump.com/hrd/sat1.html>
- Curioso, W. H., & Tapia, E. O. (2017). Training Programs for Capacity-Building in Nursing Informatics: A Peruvian Perspective. *Ciencia Y Enfermería*, 5(27). <https://doi.org/DOI:10.29393/CE27-5PCWE20005>
- Darvish, A., Bahramnezhad, F., Keyhanian, S., & Navidhamidi, M. (2014). The Role of Nursing

Informatics on Promoting Quality of Health Care and the Need for Appropriate Education. *Global Journal of Health Science*, 6(6). <https://doi.org/10.5539/gjhs.v6n6p11>.

- DeGross, A., Schooley, M., Chapel, T., & Poister, T. H. (2010). Challenges and strategies in applying performance measurement to federal public health programs. *Evaluation and program planning*, 33(4), 365–372. <https://doi.org/10.1016/j.evalprogplan.2010.02.003>
- Donahedian A. Ann Arbor, MI; Health Administration Press: 1980. ISBN: 9780914904489.
- Farokhzadian, J., Khajouei, R., Hasman, A., & Ahmadian, L. (2020). Nurses' experiences and viewpoints about the benefits of adopting information technology in health care: A qualitative study in Iran. *BMC Medical Informatics and Decision Making*, 20(240). <https://doi.org/10.1186/s12911-020-01260-5>.
- Heeks R. (2006). Health information systems: failure, success and improvisation. *International journal of medical informatics*, 75(2), 125–137. <https://doi.org/10.1016/j.ijmedinf.2005.07.024>
- Sapci, A. H., & Sapci, H. A. (2017). The Effectiveness of Hands-on Health Informatics Skills Exercises in the Multidisciplinary Smart Home Healthcare and Health Informatics Training Laboratories. *Applied Clinical Informatics*, 8(2017), 1184–1196. <https://doi.org/10.4338/ACI-2017-08-RA-0136>.
- Levine, D. M., Ouchi, K., Blanchfield, B., Saenz, A., Burke, K., Paz, M., Diamond, K., Pu, C. T., & Schnipper, J. L. (2020). Hospital-Level Care at Home for Acutely Ill Adults: A Randomized Controlled Trial. *Annals of internal medicine*, 172(2), 77–85. <https://doi.org/10.7326/M19-0600>
- Liu, S. W., Singer, S. J., Sun, B. C., & Camargo, C. A., Jr (2013). A conceptual model for assessing quality of care for patients boarding in the emergency department: structure-process-outcome. *Academic emergency medicine: official journal of the Society for Academic Emergency Medicine*, 18(4), 430–435. <https://doi.org/10.1111/j.1553-2712.2011.01033.x>
- Scriven, M. (1991). *Evaluation thesaurus* (4th ed.). Sage Publications, Inc.
- Tellez, M. (2012). Work Satisfaction among California Registered Nurses: A Longitudinal Comparative Analysis. *Nursing Economic*, 30, 73-81.