

ADDIE Module as Instructional Design Models for Perioperative Care Nursing Module for Surgical Nursing Students in Libya

Ebtehal A. Khairallah[@]

Department of Surgery and Operative Nursing, Faculty of Nursing, University of Tripoli, Libya

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ABSTRACT

Recently, perioperative nurse training programs have been encouraged to include patient safety science, team building, and evidence-based practice quality care delivery, all of which are clearly lacking from Libyan surgical nursing educational material.

This article used the generic instructional model of analysis, design, development, implementation, and evaluation (ADDIE) to design models for perioperative care nursing modules using competency-based education (CBE) to improve the academic content and clinical exposure to a perioperative curriculum in nursing schools based on an internationally approved guide.

The ADDIE (Analysis, Design, Development, Implementation, and Evaluation) model was used to design models for perioperative care nursing modules using competency-based education (CBE) to improve the academic content and clinical exposure of a perioperative nursing curriculum in nursing faculty in Libya.

This study demonstrates the utility of ADDIE in developing a perioperative model curriculum through the use of comprehensive, standardized, and evidence-based perioperative nursing care. Although proper environmental support and the availability of necessary resources are critical for the implementation of these standards, research data and outcomes can be used to improve perioperative nurses training and education. It also gives evidence for the continued development of perioperative nursing care in Libya.

Key words- Perioperative Nursing; Curriculum Design; ADDIE Analysis; Surgical Nursing.

INTRODUCTION

The first step in designing an educational program is to determine the module's need by considering factors such as labor market demands and subject area development.¹ The shortage of perioperative care nurses is a global issue due to an aging nursing specialty and increased demands in operating room.¹ It is estimated that within the next five years, nearly 20% of currently employed perioperative nurses will retire while demand for nurses continues to increase.¹ Factors contributing to the shortage include the lack of postgraduate programs, changing perioperative technology, and stressful working environments.²

In Libya, there is a shortage of nurses across all specialties, particularly in surgical nursing. The lack of uniformity in nursing school curricula is attributed to a shortage of qualified teaching staff. Additionally, a significant percentage of surgical and operative nurses in Libya are foreign, and many have left due to recent conflicts, further impacting the uniformity of perioperative nursing standards.³

Improving the academic content and clinical exposure to perioperative nursing in nursing schools is important. Many countries, including the United

States, lack in-depth perioperative nursing content and experiences in their nursing programs. Similarly, the curriculum in the surgical nursing department at Tripoli University lacks depth in academic content due to a shortage of specialized teaching staff.⁴

Education and training in patient safety are crucial. Patient safety protocols and skills training should be formally taught at the undergraduate level.⁵ Libyan patient safety teaching programs should reference internationally approved guidelines, as challenges related to a "culture of blame" and non-professional response to errors still exist.⁶ The recent conflicts in Libya have further affected patient safety due to poor safety management.⁵⁻⁷ Protecting patients' dignity in perioperative practice should be emphasized alongside patient safety, as it is a core responsibility of perioperative nurses.⁸ There is also a need to introduce evidence-based practice in nursing education, which would improve patient outcomes in the perioperative period.⁹

In the surgical nursing department at University of Tripoli, students undergo general nursing training during the first two years of their bachelor's degree, followed by specialized training in surgical nursing



during the last year. However, there is a need to enhance the role of perioperative care nurses by developing critical thinking and autonomy. In addition, the role of perioperative care nurses has shifted towards patient-centered care, focusing the aforementioned factor collectively highlight the pressing need to design a perioperative care module.

This module would address the gaps in the current curriculum and provide comprehensive training in perioperative nursing for students in the surgical nursing department at University of Tripoli. By introducing a dedicated module, students can acquire the necessary knowledge, skills, and competencies to excel in perioperative care and contribute to improved patient outcomes.

MATERIALS AND METHODS

ADDIE Module as Instructional Design Models for Peri Operative Care Nursing Module:

Most instructional designs have processes that use a mixture of content area material, and critical and creative thinking skills in the design of instructions. The generic instructional model of analysis, design, development, implementation, and evaluation (ADDIE) module.³ It inspires every instructional design process.⁴ It will be the adapted to design the module, because it is a useful tool for curriculum building and educational and practice performance improvement in student-centred education.⁵

Phase 1: Analysis

In the analysis phase, the designers' core attention is the learner. And its needs analysis, by distinguishing student's knowledge and skills needed to be met at the end of the module. During learner's needs analysis, designers examine standards and competencies

Defining the Role and the Key Competencies of Perioperative Care Nurse:

Competency-based education (CBE), an outcome-based approach will be adapted because it has shown a promising gap reduction between education and employment.⁷ During the last 25 years education revolution has been necessary, because of the increasing amount of knowledge, technology development, and decreased funding. in addition to the external forces on education institutes such as stakeholders and working markets demands. All these issues were considerable reasons for the development of competency-based education.⁸ Albeit some educators criticize this approach

questioning the quality of education offered to students.⁹ CBE has been a popular trend recently in several higher education institutes since the "acceleration movement" of the late nineteenth century¹⁰, as it prepare graduates of nursing to meet entry-level position criteria.⁸

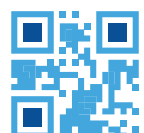
Nursing competence is a fundamental aspect of safe clinical practice, competence is defined as a combination of skills, knowledge, attitudes, values, and abilities that contribute to effective performance.¹¹ Outlining of clinical competence is an essential to identify areas where additional professional development and education are required.¹² Competency standards are still debated worldwide among perioperative nurses¹¹, because perioperative competence is an eclectic model that has been challenging to define, and even more challenging to measuring, because different aspects of care are introduced by perioperative nursing all the way through the perioperative process.¹³

The perioperative nurse competence has two predominant concepts: specialized knowledge, characterized by familiarity with perioperative practice guidelines and standards of care, and human factors, which are interpersonal and social aspects of team interactions, in the majority of research articles.¹¹ Hamlin L cited in Gillespie et al, 2009¹⁰ subdivided the two broad domains of competence are the following categories:

- *Practical Knowledge*
- *Aesthetic Knowledge*
- *Communication*
- *Coordination*
- *Leadership.*

The AORN (Association of Perioperative Registered Nurses) represents more than 41,000 registered nurses in the United States, and abroad who facilitate the management, teaching, and practice of perioperative nursing, or who are enrolled in nursing education or engaged in perioperative research.¹⁴ The AORN designed a foundation of the perioperative nurse programs, because it is comprehensive, standardized, and evidence-based it will be used as a reference in defining the rule, and competence of perioperative nursing.¹⁵

According to AORNa perioperative nurse is a RN who is using nursing process to develops individualized plans of care and then coordinates and delivers care to patient undergoing operative or other invasive procedures.¹⁶ Perioperative nurse addresses the physiological, psychological, sociocultural and spiritual needs of the surgical patients.⁴



Learning Outcomes for Perioperative Care Module

Defining specific competences of peri operative nursing they will be used to formulate the learning outcomes, using both AORN conceptual framework for perioperative nursing practice and TUNING qualifications reference framework (meta-profile) of general descriptors of a bachelor programme in the subject area of nursing (level 6).¹⁷ The conceptual framework for perioperative nursing practice adapts Patient Focused Model. In 2000, the AORN Board of Directors established the Perioperative Patient Focused Model as the conceptual framework for perioperative nursing practice.¹⁸ The model can be used with any practice setting, geographic location, or nature of the patient population so it can be used as The conceptual framework for perioperative nursing module in Libya.

The Model is divided into four quadrants, three demonstrating patient domains:

- *Patient safety.*
- *Patient physiologic responses to operative and other invasive procedures.*
- *Patient and designated support person(s) behavioural responses to operative and other invasive procedures.*

*The fourth quadrant represents the health system in which the perioperative care is delivered.*¹⁸

After analysis of standards and competencies the following learning out comes were chosen:

- *Demonstrate competence in providing the holistic patient during peri operative period, and being able to identify the physiological and psychological socio-cultural and spiritual responses of patients to surgical interventions.*¹⁸
- *Ability to Maintain competency and current behavioral and technical knowledge in perioperative nursing, using evidence based practice.*¹⁶ *Perioperative nursing is medically and technically oriented.*¹⁹
- *Showing Communication and interpersonal competencies, and the ability communicate effectively with patients, their families and their working team.*¹³ *Thus studies reported that poor communication could have dangerous safety implications, and increase adverse events.*¹¹

Communication with families in perioperative period is crucial in Libyan society similar to other middle eastern cultures families form strong ties, and they are the main social, emotional, and spiritual support of the patient for example, family members

would address health professionals for information about the patient and could influence decision making²⁰, thus improving communication skill of nursing students should include communication with patient's family. A study conducted in Saudi Arabia as the Saudi society share many social value with the Libyan society shows a wide gap in communication between the patient and nursing staff during peri operative period.²¹

- *Leadership and team working: Able to lead and work collaboratively in peri operative care team.*

It was evident that leadership has a crucial role in patient safety, the absence of an effective leadership within healthcare system the quality of services, patient safety would be negatively affected.¹¹

- *Using nursing process to develop individualized plans of care and improve perioperative outcomes. And to ensure continuity of the patient care and keeping a watchful eye during all peri operative period.*¹³

- *Patient safety: understanding safety systems and skills to protect patient's body and preserve patient dignity in perioperative practice.*¹³

Phase 2: Design

This phase includes identification of objectives, determining how the objectives will be met, the instructional strategies that will be employed to achieve the objectives, taking data from the analysis phase in consideration.²²

Learning Objectives

Learning outcomes are used to describe broad aspects of behaviour which include a wide range of knowledge and skill, while learning objectives are more specific, distinct units of knowledge and skill can be accomplished within a short timeframe.⁹ In addition learning objectives are essential to plan and deliver appropriate instruction, determine assessment tools, and strategies and ensure that instruction and assessment are united with the objectives.²³

In education, the most commonly used taxonomy is the original work of Benjamin Bloom (1956) or Bloom's revised taxonomy²³, Bloom's taxonomy consisted of six major categories: knowledge, comprehension, application, analysis, synthesis, and evaluation. According to the revised version of Bloom's Taxonomy each level is conceptually different, the six levels include remembering, understanding, applying, analyzing, evaluating, and creating.²³

According to Bloom there are three domains of



educational activities or learning²⁴include:

- Cognitive: mental skills (knowledge).
- Affective: development in feelings or emotional (attitude).
- Psychomotor: manual or physical skills (skills).

Learning objectives of per operative nursing will be designed using both cognitive domain involves knowledge and the development of intellectual skills, in addition to the affective domain²³includes the way in which we deal with things emotionally, such as feelings, values, appreciation, enthusiasms, motivations, and attitudes.²⁴

As discussed previously the perioperative nurse competence has two predominant concepts: specialized knowledge, characterized by understanding with perioperative practice guidelines and standards of care, and human factors, which are interpersonal and social aspects of team interactions.¹¹ In addition, as explained by Kerrie, nurses with positive attitudes are able to provide more proper and professional care action; in addition 'empathy' is an important value by which this caring is expressed.²⁵

Based on all above, by the end of the module students and following their assessment, students will have demonstrated ability to:

1. *Demonstrate acknowledge of patient safety according perioperative practice guidelines.*
2. *Assess patients' physiological and psychological response to surgery during perioperative period.*
3. *Demonstrate ability to communicate effectively with patient and working team based on effective communication skills in nursing practice.*
4. *Demonstrate ability to lead and work collaboratively in peri operative care team.*
5. *Comprehend the holistic patient centered care concept during perioperative period according to the perioperative patient focused model.*
6. *Apply behavioral and technical knowledge in perioperative nursing, using evidence based practice.*
7. *Demonstrate ability to develop individualized plans of care to improve perioperative outcomes.*
8. *Using nursing process to develop individualized plans of care and improve perioperative outcomes. And to ensure continuity of the patient care.*

Instructional strategies to meet learning objectives:

To maximize students' intellectual development according to Bloom's hierarchy, we'll use experiential learning, which posits that experiences shape understanding and can be transformed.²⁶ Kolb's Learning Cycle, consisting of four stages (concrete experience, reflective observation, abstract conceptualization, and active experimentation), will guide the process.²⁷ We'll combine this approach with process-based learning methods, such as problem-based, requirement-based, and case-based learning, selecting the most appropriate one for each learning objective.²⁸ Simulation training and realistic operative environments will be used, as they have been shown to enhance knowledge, psychomotor, and analytical skills, Post-scenario debriefing and discussion will facilitate reflection and analysis.²⁹

Learning Outcomes Assessment Strategies:

To ensure that assessment aligns with curriculum objectives, we will use Biggs' Constructive Alignment model, which emphasizes coherence between assessment, teaching strategies, and intended learning outcomes.³⁰ We will focus on the verbs within the learning outcomes based on Bloom's taxonomy, and ensure that assessments measure desired competencies with validity, accuracy, utility and relevance.⁸

Evaluation tool:

Outcome-based evaluation tool will be adapted in clinical setting, and simulation bedside assessment, Mikasa et al explains that outcome-based evaluation of student performance helps student mastery of course objectives, validate efficacy of this simulation learning modality, facilitate reflection, and guide the debriefing process.³¹ The pressing need to design a perioperative care module.

Phase 3 and 4: Development and Implementation.

In the development stage, effective leadership and decision-making are required to put the plans into action. The appointment of an expert module leader is crucial as they should be skilled in institutional policies, team functioning, and ensuring timely processing of module development activities, as well as discussing resources with the school dean and authorized committee.²⁸

According to Boore and Deeny (2012), decision making in module development is a dynamic and interactive process guided by the module's goals, effective strategies, and contextual factors.²⁷ Productive approach, which entails regular meetings and step-by-step decision-making, is the most rational approach. Participants should assess



decisions and plan for the next activity by creating new ideas. Recordkeeping of meetings and decisions is also important due to the prolonged duration of the development process.

Pestova (2017)³¹ suggests that development stage involves continuous drafting, production, and evaluation, which can be facilitated by asking four direct questions during the process:

1. Is the timeframe suitable for the chosen teaching material?

2. Are all participants effectively working and communicating?

3. Are they participating to their optimal capacity?

4. Are the chosen materials effective in achieving the desired outcomes?

*By considering these factors, the development stage can be conducted efficiently and effectively.*³²

Implementation

Like many other low- and middle-income nations such as Egypt, Libya remains based on earlier models of nursing education, didactic teaching methods, the nurse's role conceptualized as the doctor's "handmaiden", and adoption of training in hospital- and task-based models, moving to a competency-based model (CBE) considered a challenge for both students and teaching staff.³³ Implementation and development of (CBE) requires collaboration between educational and regulatory and practice groups, in addition to innovation in education and practice setting⁸, which will be disorganized in Libyan system recently.

In fact, ensuring alignment of a new curricula with global standards while reflecting local culture, context and population health demands is another challenge³³, for instance adapting AORN developed model for perioperative nursing practice as conceptual framework does not guarantee applicability of all its standards, while its standards are comprehensive, standardized, and evidence based perioperative nursing care meeting these standards designed assuming that adequate environmental support and necessary resources are available for the application of these standards. Furthermore regulatory bodies like hospitals policies and National Centre of Accreditation also would have specific requirements that must be met in the course of delivering perioperative patient care³⁴, each of the obstacles listed are challenges need the creation of practical standardized strategies and decisions during development process.

Using experiential learning theory which derived adult education and, the continuous cycling model of learning that has become known as the 'Kolb Learning Cycle' in this module design will be a challenging task for both students and educators, as educators need to realize that learners usually do not cycle smoothly through the model, and may find difficulty in progress which may cause tension and effect learning outcome²⁷, this difficulty of smooth cycle will more likely in Libyan nursing education setting because it is mainly using traditional teaching.

Staff members in traditional teaching get used to relaxed atmosphere and adopted to the existing environment will resist any change, not only in the curriculum but also the module of learning. Moreover Changes are not only difficult for faculty members but also it will be a big change for students who are used to traditional teaching.³⁵ For instance students are not used or trained to use reflection which an essential step Kolb Learning Cycle. Likewise PBL (problem based learning) approach requires critical thinking and problem solving skills, active participation in the learning process, and to integrate and synthesis variety of knowledge³⁶, students are not trained to use all these skills effectively.

All of these barriers reflected the importance of training teaching staff and mentors to improve students' affective domain, like communication skill, leadership skills, and, critical thinking. In addition, using stimulating environment necessitate trained qualified teaching staff to be used in the most effective way.³⁷

Securing Resources:

After shaping the plan for module development, necessary resources to develop and implement the module will be requested from faculty. Including budget for data collection, adapted media resources including E-learning tools, providing training and consultation for teaching staff and module developers.

Accreditation standards of undergraduate nursing schools of Libya:

In Libya, the Ministry of Higher Education governs educational institutions, including University of Tripoli. Quality assessment of new modules and educational material is conducted by specialized committees, but there are still missing elements in the process, such as coordination between regulatory bodies and educational institutions, which affects data collection, performance monitoring, and quality



assurance. To address this issue, national policies and guidelines for data collection and management should be implemented.³⁸

Phase 5: Evaluation

The final stage of the ADDIE method is Evaluation²², which is critical in nursing education programs due to the responsibility graduates have for the lives of others and the need to meet accreditation criteria.³⁸ During this stage, the module will undergo rigorous testing to ensure unit harmony and progress, and feedback will be gathered from learners, teaching colleagues, and self-generated reflections and observations. It is important to note that feedback may yield unclear results, which requires further investigation or exploration of possible solutions, as there is no ideal response to feedback, but rather a range of options based on suitability and feasibility.²⁷ Stakeholder involvement is a crucial element of successful program evaluation, although it can be time-consuming for both evaluators and staff.³⁹ Faculty and multiple stakeholders, including students, clinicians, patients, educators, and nurse managers, will play key roles in decision-making during implementation and evaluation. In countries with a private funding system for universities, stakeholder involvement is more common than in countries like³⁸ Libya, where health education is mainly funded by the Ministry of Higher Education.³⁷

CONCLUSION

This study shows how ADDIE can be used to develop a perioperative model curriculum based on comprehensive, standardized, and evidence-based perioperative nursing care. Adequate environmental support and availability of resources are crucial for implementing these standards. Research data and outcomes can improve perioperative nurse training and education, and help advance perioperative nursing care in Libya.

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