

Research Article

Training and Development Strategies for Nurses' Competence in Managing Pain: A Pilot Study

Litaba Efraim Kolobe¹ , Pooja Vishnoi^{2,*} 

¹Pain Management, Ministry of National Guard Health Affairs, Riyadh, Kingdom of Saudi Arabia

²Faculty, Exceed College, Sharjah, United Arab Emirates

Abstract

Background: Nurses need training and development to provide safe and effective pain treatment. Although nurses get pain management training, little is known about how nursing leadership improves nurses' competencies in diverse nursing care domains. Implementing training and development techniques might be difficult since nurses must apply their learning to their specialty. Researchers needed this pilot study to examine research methodologies, find problems, and improve the research instrument before the major study. **Aim:** This preliminary study aimed to explore nursing leadership strategies for training and developing nurses' competence in managing pain and improving the reliability and validity of the main study data. **Methods:** The sequential mixed-methods approach began with descriptive quantitative methods. In this initial quantitative phase, 10% of a proportionate stratified probability sampling of nurse managers and clinical facilitators was used to generate these pilot study results. **Results:** This pilot study revealed three main training and development strategies that nurse managers and clinical facilitators employ to ensure nurses' pain management competence. These encompass (1) the four foremost on-the-job pain management training and development strategies such as preceptorship, career development, in-service training, and hands-on training; (2) the four topmost off-the-job strategies that include group discussions, e-learning, competency-based training, and simulation; and (3) nurse leaders' distinctive pain management training and development strategies. The survey instrument demonstrated stability and consistency with a Cronbach's alpha (α) score of 0.66 for the initial assessment and 0.79 for the second assessment, requiring adjustments before the main study. **Conclusion:** The findings of this pilot study help inform the modifications needed before executing the main study and healthcare institutions' training and development strategies that play a crucial role in enhancing nurses' competency, which is essential for delivering high-quality pain nursing interventions that can be employed by nursing leadership. **Nursing Management Implications:** These pain management nursing training and development initiatives can improve patient experience and satisfaction outcomes, nurses' competence, and healthcare facilities' excellence.

Keywords

Competencies, Pain Management, Strategies, Training and Development

1. Introduction

Employing training and development strategies in nursing aims to train and develop nurses' competency and introduce

new skills in their nursing care areas. Training and development are integral components of continued professional de-

*Corresponding author: pooja@ebfedu.com (Pooja Vishnoi)

Received: 4 April 2025; **Accepted:** 16 April 2025; **Published:** 22 May 2025



Copyright: © The Author(s), 2025. Published by Science Publishing Group. This is an **Open Access** article, distributed under the terms of the Creative Commons Attribution 4.0 License (<http://creativecommons.org/licenses/by/4.0/>), which permits unrestricted use, distribution and reproduction in any medium, provided the original work is properly cited.

velopment aimed at staying current with the workplace's ever-changing dynamics to improve competency within a perspective that is related to employment [1-3]. Training and development strategies allow organizations to successfully adapt to these changes by acquiring or transferring knowledge, skills, and abilities (KSA) needed for performing certain tasks or activities [4].

The difficulty in training and development within Saudi Arabian teaching hospitals' nursing sector is in executing the most appropriate strategies that both develop nurses' ability to transfer knowledge effectively and display their practical competence across different nursing care domains. Another hurdle may be the approach employed by nurse managers and clinical facilitators in training nurses to assess and treat pain. Nurses may lack proficiency in utilizing pain assessment instruments and fail to adhere to nursing norms that promote compliance in interventions, or they may rely on misconceptions that hamper the successful management of patients' pain experiences.

Nurse leadership in pain management competencies is crucial for guiding nurses to treat pain and effectively improve patient experience and satisfaction outcomes. This also reduces hospitalization duration, minimizing consequences associated with inadequately managed pain [5].

Effective nurse leadership strategies for training and development of nurses' competence significantly influence patient outcomes by motivating and directing nursing staff in patient management and skill enhancement, as evidenced by the study conducted by Al-Rjoub et al [6].

Aktar's [7] study examined the impact or effect of training and development strategies on employee performance. Nevertheless, the researcher is not aware of any studies that have identified strategies that would enhance the training and development of nurses to be competent in pain management in the Saudi Arabian context.

It has been shown in studies that the workplace is an effective context for training and development, and nurses are more likely to pursue training and development if what they learn is related to their work and aligns with the priorities of the organization [3].

Many studies demonstrate that applied nursing pain management training and development programs are monodisciplinary and not interdisciplinary focusing either on acute pain, cancer pain, chronic pain, or core competency education programs [8-10]. However, limited research exists to indicate strategies employed by nursing leadership to develop nurses, particularly in pain management competencies. This deficiency in other studies addresses strategies implemented by nursing leadership to enhance the competencies of nurses to manage pain.

The most recent studies [6, 10-16] demonstrate enormous training and development strategies that were recommended to enhance nursing practice and competencies of nurses in pain management, and the following examples of strategies place the learners in the central role, allowing them to actively construct knowledge through firsthand experience in pain

management, thus include: the completion of formal education programs such as bachelor's and master's degree programs to enhance learning in pain management; the completion of pain management specialty certifications; multimodal teaching approaches such as didactic teaching and vignettes of cases; leadership styles that enhance compliance such as transactional; consistent assessments of performance and feedback, including self-evaluation, competency based assessment and evaluation by peers in the domain of pain management; game-based learning; assessing nurses' knowledge and attitude regarding pain management using reliable tools such as "Nurses' Knowledge and Attitudes Survey Regarding Pain" (NKASRP), nurses monitored to practice pharmacological and nonpharmacological intervention related to pain management; off-the job training such as regular pain management workshops and conferences, online pain management courses and webinars, journal or books clubs to stay abreast; on-the job training programs like mentorship, preceptorship.

The purpose of this pilot study was to investigate the strategies for training and development initiatives employed by nursing leadership to enhance nurses' pain management competencies within the context of Saudi Arabia. The study also assessed how the research methodology improves the reliability and validity of the survey instrument employed for data collection. This research is significant for Saudi Arabian hospitals as it will enhance training and development strategies to improve nurses' competence in pain management.

According to the researchers, there is no comparable study within the setting of Saudi Arabia; thus, this motivated the initiation of the current investigation.

2. Materials and Methods

This preliminary study aimed to explore and describe nursing leadership training and development strategies utilized in pain management to enhance nurses' competencies and improve the reliability and validity of the main study.

2.1. Conceptual Frameworks

For the training and development process, Blanchard and Thacker's five-phase analysis, design, development, implementation, and evaluation (ADDIE) framework (2023) was adopted [17]. Using this model, the aim was to explore the training and development strategies employed by nurse managers and clinical facilitators to facilitate nurses' competence in pain management.

2.2. Research Design

A descriptive quantitative design was applied to present a comprehensive summary of the data analysis using a survey instrument created with Google Forms. Fifteen participants (n=15), comprising nurse managers and clinical facilitators,

were selected using purposive sampling to voluntarily participate from three hospital sites, A, B, and C, representing roughly 10% as a rule of thumb of the entire study sample (N=152) to assess the feasibility of the study and the applicability of the survey tool. Time one of the mailed pilot surveys was participated only by twelve (n=12; f=80%; N=15) participants that voluntarily completed the pretest survey, yielding a commendable response rate of 80%, while time two by eleven (n=11; f=92%; N=12) participants that yielded an excellent response rate of the test-retest survey [18, 19].

2.3. Research Setting

This study was conducted in three teaching hospitals providing nursing programs under the Ministry of National Guard Health Affairs in Riyadh, the capital of the Kingdom of Saudi Arabia.

2.4. Research Survey Tool

The survey instrument consists of 47 main items grouped into five sections (A to E). For this study, only Sections A and C play a major role in publishing this research. Section A covers the demographic part, while Section C, included in this pilot, contains three sub-sections of the tool designed to examine training and development strategies utilized by nursing leadership. A 4-point Likert scale, ranging from 1 (strongly disagree) to 4 (strongly agree), was applied to Section C's specific pain management training and development (10 items), alongside a tick box to select on-the-job training strategies (7 items) and another tick box for off-the-job strategies (11 items). The survey instrument demonstrated stability and consistency through test-retest reliability, yielding a Cronbach's alpha coefficient (α) (CA) value of 0.66 in the initial test and 0.79 in the subsequent assessment, which served as a baseline for the main study, ensuring the reliability and validity of the survey tool [19]. A literature review was conducted to develop a survey related to strategies used in training and developing nurses' competence in pain management while refining the tool.

2.5. Data Collection and Analysis

Emails were sent out by nursing directors who were serving as gatekeepers in order to recruit nurse managers and clinical facilitators. This was done to collect the data.

Participants, comprising nurse managers and clinical facilitators, were readily accessible and willing to participate, as determined through purposive sampling. The memos include the link to the Google Form for facilitating volunteer engagement. Participants were permitted to submit their responses online. The data were analysed automatically on Google Forms and presented as frequencies and percentages. The researcher further statistically analyzed the frequencies and percentages descriptively to elucidate the study outcome for presentation.

2.6. Ethical Considerations

The study was approved by the research ethics committee of the King Abdullah International Medical Research Center (KAIMRC), (study no: NRR 24/052/10), and the Exceed College under Universidad Católica San Antonio de Murcia (UCAM).

Informed consent was secured from each nurse manager and clinical facilitator before participating in the volunteer data collection, following their receipt of the study's objectives, methods, and rights to decline or withdraw from the project.

3. Results

The findings indicate that eleven (N=11) nurse managers and clinical facilitators engaged in the second phase of the pilot investigation. Figure 1 illustrates the age ranges of nurse managers and clinical facilitators, which span from 32 to 58 years.

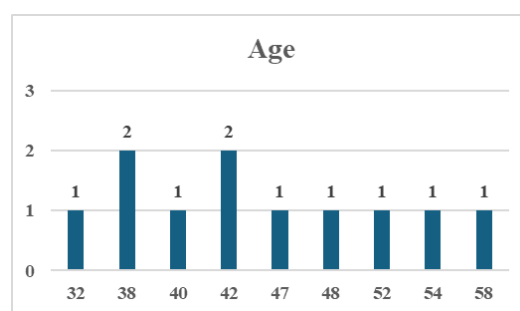


Figure 1. The ages of the 11 participants.

The participants' demographics are illustrated in Table 1 below.

Table 1. Characteristics of the participants.

Characteristics		n=	f=%
Gender	Female	11	100
	Male	0	0
	Total	11	100
Nationality	Malaysian	5	45.5
	South African	2	18.2
	Filipino	2	18.2
	Saudi	2	18.2
	British	1	9.1
	Total	11	100
Positions held	Nurse Managers	3	27.3

Characteristics		n=	f=%
Educational qualifications	Clinical facilitators	8	72.7
	Total	11	100
	Master's degree	4	36.3
	Bachelor's degree	6	54.6
	Diploma	1	9.1
	Total	11	100

Table 1's demographic distribution illustrates that all 11 nurse managers were females with mixed nationalities. The highest educational qualification was a master's degree, held by 36.3% (n=4), 54.6% (n=6), and only 9.1% (n=1) had a diploma in nursing.

As demonstrated in Table 2, the nurse managers and clinical facilitators indicated their agreement regarding the specific pain management training and development strategies employed in the context of these three Saudi Arabian teaching hospitals.

Table 2. Specific pain management training and development strategies.

Likert scale	Strongly agree		Agree		Disagree		Strongly disagree		Total	
	4		3		2		1			
Specific pain management training and development strategies	n=	%	n=	%	n=	%	n=	%	N=	%=
Analyzing pain management training and development needs	8	72.7	3	27.3	0	0	0	0	11	100
Assessing resources needed for pain management training and the development of nurses	7	63.6	4	36.4	0	0	0	0	11	100
Planning and developing pain management training and development	6	54.5	5	45.5	0	0	0	0	11	100
Performing audits of nurses' compliance for the quality of pain management	6	54.5	5	45.5	0	0	0	0	11	100
Motivate pain management trainers to participate in pain management training programs	6	54.5	5	45.5	0	0	0	0	11	100
Motivate nurse trainees to attend pain management training programs and apply the knowledge and skills learned	6	54.5	5	45.5	0	0	0	0	11	100
Motivating clinical facilitators to participate in a pain management training program.	6	54.5	5	45.5	0	0	0	0	11	100
Developing pain management training programs linked to the goals of the hospital to achieve the best results	5	45.5	6	54.5	0	0	0	0	11	100
Setting SMART pain management learning objectives	5	45.5	6	54.5	0	0	0	0	11	100
The nursing administration is developing metrics to measure progress in nurse training and development of pain management	5	45.5	6	54.5	0	0	0	0	11	100

The results in Table 2 demonstrate that all (N=100%) nurse managers and clinical facilitators unanimously confirmed their utilization of the 10 designated pain management training and development strategies in their clinical settings, as evidenced by their scores of 4 and 3 on the Likert scale. These measures were deemed to enhance nurses' competency in pain management.

This indicates that on the four-point Likert scale used, all 11 participants strongly agreed, rating the score of four with an average of 54.53%, while they rated agreement with a score of three, averaging 45.47%. None of the participants expressed any disagreement with the ten strategies.

Table 1 indicates that all 10 strategies were unanimously agreed upon, ranked from highest to lowest ratings as follows:

(1) analyzing pain management training and development needs (2) assessing resources needed for pain management training and development of nurses; (3) planning and developing pain management training and development; (4) performing audits of nurses' compliance for quality of pain management; (5) motivating pain management trainers to participate in pain management training programs; (6) motivating nurse trainees to attend pain management training programs and apply the knowledge and skills learned; (7) motivating clinical facilitators to participate in a pain management training program. (8) developing pain management training programs linked to the goals of the hospital to achieve the best results; (9) setting SMART pain management learning objectives; and (10) the nursing administration developing metrics to measure progress in nurse training and development of pain management.

Table 3. Top four pain management on-the-job training and development strategies.

On-the-job Strategies	N=11	
	n=11	%=100
Preceptorship	11	100
Career development	10	90.9
In-service training	10	90.9
Hands-on training	9	81.8
Team training	7	63.6
Unit rotation	6	54.5
Internship	6	54.5

As shown in Table 3, statistically and significantly illustrates the four topmost strategies indicated to be employed by the nurse managers and clinical facilitators. 100% (N=11) of the nurse managers and clinical facilitators indicated using a *preceptorship* strategy to enhance nurses' pain management competencies. However, *career development* and *in-service training* were shown to be employed by 90.9% (n=10) of nurse managers and clinical facilitators. *Hands-on training* was employed by 81.8% (n=8).

Table 4 indicates the emergence of the top four most-used pain management off-the-job training and development strategies employed by nurse managers and clinical facilitators. Of 11 participants, 90.9% (n=10) of nurse managers and clinical facilitators specified using *group discussions* and *e-learning* strategies. At the same time, 81.8% (n=9) of the participants employed *competency-based training* as well as *simulation* strategies to enhance nurses' competencies in pain management.

Table 4. The top four pain management off-the-job training and development strategies.

Off-the-job Strategies	N=11	
	n=11	%=100
Group discussions	10	90.9
E-learning	10	90.9
Competency-based training	9	81.8
Simulation	9	81.8
Classroom lectures	8	72.7
Conferences	8	72.7
Roleplaying	7	63.6
Case studies	7	63.6
Role modeling training	5	45.5
Audio-visual	5	45.5
Virtual pain management training	3	27.3

4. Discussions

This preliminary study aimed to describe the training and development strategies essential in pain management for the ongoing professional development of nurses' competency as designed by nurse managers and clinical facilitators for nurses to remain abreast of the workplace's ever-evolving dynamics, hence enhancing competence about pain management. This is evidenced by the distinct pain management training and development methods used by nursing leadership, as illustrated in Tables 2 and 3.

Distinctive pain management training and development strategies by nursing leadership

Considering the context of these Saudi Arabian teaching hospitals, unique pain management nurse leadership training and development strategies indicated in this preliminary study were those aligned to pain management, aimed at developing nursing competencies in pain management. This establishes a culture of continuous learning and improvement of pain management within the nursing team. This study's strategy of (i) analyzing pain management training and development requirements employed by all nurse managers and clinical facilitators who participated shows no contrast, as it aligns with Zarei et al.'s research findings [19]. This indicates that the leadership was assessing the training requirements of each unit for pain management prior to the nurses' participation in training. In essence, nurses' professional competence and performance can be enhanced through the identification of professional needs and a thorough review of the teaching and learning process [19]. (ii) Assessing resources needed for pain management training and development of nurses' competency was not in contrast with the study in Rwanda [20] on the

adequate quantity of resources for training nurses and support for evaluating and managing pain in the clinical setting. This suggests that, before training, resources required for pain management were assembled to facilitate seamless training.

In addition, (iii) the strategy of planning and developing pain management training and development strategies from evidence-based practices linked to nurse trainees' specific nursing care areas was indicated to enhance nurses' competencies, consistent with the study conducted by Uwimana et al. in previous studies [20, 21]. The educators were instructing nurses on pain management grounded in evidence-based practice. (iv) Performing audits of nurses' compliance for quality of pain management was another technique employed. This revealed that nurses' practice in these hospitals was evaluated using key performance quality indicators, which indicated their adherence to pain management criteria to improve their competence. This practice is in conjunction with the study done in Australia [22] that demonstrated that audit with personal feedback, when combined with other context-specific strategies, is a reliable method for gaining competency in pain management to improve nurses' clinical nursing practice. (v) Bahati et al. [22] support the strategy of this finding that developing pain management training programs linked to the hospital's goals is essential to achieve the best results of keeping nurses updated and competent with the latest pain management advancements, evidence-based practices, and patient-centered care approaches. (vi) Setting pain management learning objectives under the specific, measurable, achievable, relevant, and time-sensitive (SMART) criteria is intended to enhance nurses' competency in providing patient pain management resources, functional pain goals, and personal pain goals (PPG), so ensuring patients experience managed pain. [23]. (vii) The study by Shahmoradi et al. [24] supports the findings of this preliminary study that the nursing administration strategy of developing metrics to measure progress in nurse training and development of pain management enhances nurses' pain management competency. This is also supported by the study done in Saudi Arabia by Innab et al [15]. (viii) The other strategy used was to motivate pain management trainers to participate in pain management training programs to improve their competency in pain management. In alignment with the strategy used, it was also found in a Rwandan study [25] that student motivation by empowering and supporting nurses in both academic and clinical settings with required resources and conducting continuing education should be considered to optimize pediatric pain relief practices by promoting a sound pedagogical approach to facilitate pain management skills acquisition by nurses. (ix) Nurse trainees were motivated to engage in pain management training programs and implement the acquired information and abilities; (x) Furthermore, clinical facilitators were similarly encouraged to participate in a pain management training program [3, 19, 24-27].

On-the-job training and development strategies

The results revealed the top four most on-the-job training

strategies employed at the work environment by nurse managers and clinical facilitators in this study context and similarly as also indicated in other studies, thus including (i) *Preceptorship* whereby the nurse preceptor supports, guides, and facilitates, or shares the knowledge, skills, and experience with the nurses' preceptees [28-30]. The rationale of using this strategy was great help from utilizing the preceptors by educating other new nurses in clinical areas about pain management (ii) *Career development*, which is the provision of education, training, mentorship, and coaching to individuals to equip individuals with the necessary skills in pain management [29]. This strategy was utilized as the nurses' expertise in pain management was elevated to a higher level. (iii) *In-service training* that is brief and specific pain management education in clinical areas found to enhance nurses to be more knowledge and competence [31]. It was essential to inform nurses in clinical settings about recent advancements in pain treatment or identified concerns. (iv) *Hands-on training* strategy done by teaching nurses at the bedside how to perform a pain management procedure accurately and safely achieves a dramatic increase in nurses' competence to treat patients with pain as the training and development strategy recommended by Kurz et al [32].

Off-the-job training and development strategies

Off-the-job training and development strategies for pain management aimed at enhancing clinical knowledge are strongly recommended as prerequisites for effective nursing care [20]. The top four off-the-job training strategies identified to be conducted separately from the job environment by nurse managers and clinical facilitators, supported by previous studies, include (i) *group discussions* utilizing an open-ended and collaborative approach that encourages the formal or informal exchange of ideas to improve nurses' pain management competency [15, 20]; (ii) *e-learning* serves as a self-directed formal training method that utilizes electronic resources, such as computers, to access educational materials [33]. This method was used to enable easy access by nurses to learn about pain management online. The study by Ozawa et al. [33] demonstrated that the e-learning program improved nurses' competency in neonatal pain management compared to those without training; (iii) *competency-based training* that entails a minimal lecture format and emphasizes active, practical tasks. The effectiveness of competency-based training has been demonstrated in an Iranian study involving a minimum lecture format and focused on active, practical tasks [34]. This study indicated that the competency-based model strategy is accompanied by continuous evaluation and feedback, which can influence clinical learning and is primarily utilized for professional skills such as pain management; and (iv) a *simulation* strategy designed to incorporate the training and development of nurses with equipment similar to what they will use for pain management indicated improvements in nurses' pain management competencies, similarly employed in the study by Kurz et al [32]. These four top-employed strategies are shown to provide opportunities for ongoing

education and training in pain management techniques.

5. Conclusions and Future Research

The study identified three training and development initiatives that nurse managers and clinical facilitators utilize to ensure nurses' competency in pain management. These initiatives comprise (1) preceptorship, career development, in-service training, and hands-on training; (2) group discussions, e-learning, competency-based training, and simulation; and (3) distinctive pain management training and development strategies employed by nurse leaders. The survey instrument demonstrated stability and consistency, indicated by Cronbach's alpha (α) scores of 0.66 for the initial tests and 0.79 for the second tests, highlighting the need for adjustments before the main study.

The training and development strategies utilized by nurse managers and clinical facilitators are vital in enhancing nurses' competencies, which are crucial for delivering high-quality pain management interventions that lead to improved patient outcomes. These strategies enhance clinical skills in pain management, improve patient safety during pain management, increase job satisfaction by instilling confidence in nurses when managing patients with various pain types, and foster better patient care. Additionally, they help develop leadership skills in pain management and promote a culture of excellence and cost-effectiveness within hospitals.

As this study is a pilot, it is recommended that the main study be conducted to further gather more data necessary to assess the impact of these training and development strategies on nurses' competencies in pain management.

Abbreviations

CA (α)	Cronbach's Alpha Coefficient
KSA	Knowledge, Skills, and Abilities
KAIMRC	King Abdullah International Medical Research Center
NKASRP	Nurses' Knowledge and Attitudes Survey Regarding Pain
PPG	Personal Pain Goals
SMART	Specific, Measurable, Achievable, Relevant, and Time-Sensitive
UCAM	Universidad Católica San Antonio de Murcia

Author Contributions

Litaba Efraim Kolobe: Conceptualization, Formal Analysis, Funding acquisition, Investigation, Methodology, Project administration, Resources, Software, Visualization, Writing – original draft, Writing – review & editing

Pooja Vishnoi: Supervision

Funding

This work is not supported by any external funding.

Data Availability Statement

The data is available from the corresponding author upon reasonable request.

Conflicts of Interest

The authors declare no conflicts of interest.

References

- [1] Chiampou, E., Maz-Machado, A., Valenzuela, G. L. et al. The continuing training of nurses and their impact on their organizational commitment. *Revista de Gest ão Social e Ambiental*. 2024, 18(7), 1-16. <https://doi.org/10.24857/rgsa.v18n7-041>
- [2] Petrychenko, O., Petrichenko, I., Burmaka, I. et al. A. Changes in modern university: challenges of today and development trends. *Транспортні системи і технології*. 2023, (41), 74-83. <https://doi.org/10.32703/2617-9059-2023-41-6>
- [3] King, R., Taylor, B., Talpur, A. et al. Factors that optimise the impact of continuing professional development in nursing: A rapid evidence review. *Nurse education today*. 2021, 98, 104652. <https://doi.org/10.1016/j.nedt.2020.104652>
- [4] Sava, L., Tîrșu, V., & Petreanu, E. Evaluation of the process of professional staff training in the Republic of Moldova. *Bulletin of the Transilvania University of Brasov. Economic Sciences. Series V.*. 2024, 17(1), 83-98. <https://doi.org/10.31926/but.es.2023.17.66.1.8>
- [5] Quinonez, A., Klein, K., Skill sky, C. A. et al. Care Coordination. *Textbook of Adult-Gerontology Primary Care Nursing: Evidence-Based Patient Care for Adolescents to Older Adults*. 2022.
- [6] Al-Rjoub, S., Alsharawneh, A., Alhawajreh, M. J. et al. Exploring the Impact of Transformational and Transactional Style of Leadership on Nursing Care Performance and Patient Outcomes. *Journal of Healthcare Leadership*. 2024. 16, 557-568. <https://doi.org/10.2147/JHL.S496266>
- [7] Aktar, S. The effect of training and development methods on employee satisfaction and performance in commercial banks. *Management Dynamics in the Knowledge Economy*. 2023, 11(1), 30-47. <https://doi.org/10.2478/mdke-2023-00>
- [8] Munneke, W., Demoulin, C., Nijs, J. et al. Development of an interdisciplinary training program about chronic pain management with a cognitive behavioural approach for healthcare professionals: part of a hybrid effectiveness-implementation study. *BMC Medical Education*. 2024, 24, 1-16. <https://doi.org/10.1186/s12909-024-05308-2>

- [9] Athayasai, J., Chatchumni, M., Eriksson, H. et al. Surgical nurses' perceptions of strategies to enhance pain management proficiency: A qualitative study. *Nursing Reports*, 2023, 13(2), 923. <https://doi.org/10.3390/nursrep13020081>
- [10] Liu, X., Li, L., Wang, L. et al. Implementation and evaluation of a pain management core competency education program for surgical nurses. *International Journal of Nursing Sciences*. 2021, 8(1): 51-7. <https://doi.org/10.1016/j.ijnss.2020.09.008>
- [11] Cascella, M., Cascella, A., Monaco, F. et al. Envisioning gamification in anesthesia, pain management, and critical care: basic principles, integration of artificial intelligence, and simulation strategies. *Journal of anesthesia, analgesia and critical care*. 2023. 3(1): 33. <https://doi.org/10.1186/s44158-023-00118-2>
- [12] Nguyen, AT, Dang AK, Nguyen HT. et al. Assessing knowledge and attitudes regarding pain management among nurses working in a geriatric hospital in Vietnam. *Journal of Multidisciplinary Healthcare*. 2021. 12: 799-807. <https://doi.org/10.2147/JMDH.S285044>
- [13] Okiri, TK., Kipmerewo, M., & Mukabana, B. Neonatal pain management practices among nurses working in newborn units in Nyanza and Western Kenya. *Nurse and Health: Jurnal Keperawatan*. 2023. 12(2): 252-264 <https://doi.org/10.36720/nhjk.v12i2.599>
- [14] Sekar, D., & Bhuvanawari, M. The intricate dynamics of personality, emotional intelligence, and family in adolescent tendencies towards delinquent-prone behavior. *Journal of Human Behavior in the Social Environment*. 2024. 1-2. <https://doi.org/10.1080/10911359.2024.2441291>
- [15] Innab, A., Alammari K., Alqahtani, N. et al. The impact of a 12-hour educational program on nurses' knowledge and attitudes regarding pain management: a quasi-experimental study. *BMC nursing*. 2022. 21(1): 250. <https://doi.org/10.1186/s12912-022-01028-4>
- [16] Okubai, T., Fessehayee, S., Gebray, AY. et al. Final-semester nursing students' knowledge and attitude regarding pain management in resource-limited settings. *International Journal of Africa Nursing Sciences*. 2023. 18: 100542. <https://doi.org/10.1016/j.ijans.2023.100542>
- [17] Blanchard, PN., & Thacker, JW. *Effective training: Systems, strategies, and practices*. SAGE Publications; 2023.
- [18] Holtom, B., Baruch, Y., Aguinis, HA., et al. Survey response rates: Trends and a validity assessment framework. *Human relations*. 2022. 75(8): 1560-84. <https://doi.org/10.1177/001872672110707>
- [19] Izah, SC., Sylva L, & Hait, M. Cronbach's alpha: A cornerstone in ensuring reliability and validity in environmental health assessment. *ES Energy & Environment*. 2023. 23: 1057. <https://doi.org/10.30919/esee1057>
- [20] Zarei, M., Mojarab, S., Bazrafkan, L., et al. The role of continuing medical education programs in promoting Iranian nurses, competency toward non-communicable diseases, a qualitative content analysis study. *BMC medical education*. 2022. 22(1): 731. <https://doi.org/10.1186/s12909-022-03804-x>
- [21] Uwimana, P., Mukamana, D., Babenko-Mould, Y., et al. A framework for capacity enhancement of Rwandan nurse educators and preceptors facilitating nursing students to learn paediatric pain management. *BMC nursing*. 2024. 23(1): 127. <https://doi.org/10.1186/s12912-024-01769-4>
- [22] Chatchumni, M., Eriksson H., & Mazaheri, M. Core components of an effective pain management education programme for surgical nurses: A Delphi study. *International Journal of Qualitative Studies on Health and Well-Being* 2022 12; 17(1). <https://doi.org/10.1080/17482631.2022.2110672>
- [23] Bhati, D., Deogade, MS., & Kanyal, D. Improving patient outcomes through effective hospital administration: a comprehensive review. *Cureus*. 2023. 15(10). <https://doi.org/10.7759/cureus.47731>
- [24] Ehrlich, O., Lackowski, A., Glover, TL., & Vallerand, AH. Use of Goals in Cancer Pain Management: A Systematic Review. *Journal of Pain and Symptom Management*. 2024. <https://doi.org/10.1016/j.jpainsymman.2024.05.026>
- [25] Shahmoradi, L., Mehrabanfar, M., Meibodi, SA., et al. Training pain management to nursing students: Designing, implementing, and evaluating a mobile-based application. *Journal of Education and Health Promotion*. 2021. 10(1): 379. https://doi.org/10.4103/jehp.jehp_1496_20
- [26] Uwimana, P., Mukamana, D., Babenko-Mould Y., & Adejumo O. Exploring factors affecting the facilitation of nursing students to learn paediatric pain management in Rwanda: A descriptive qualitative study. *Plos one*. 2022.17(2): e0263609. <https://doi.org/10.1371/journal.pone.0263609>
- [27] Costa, T., Silva, IA., Peres, HH., et al. Nurses' motivation, knowledge, and satisfaction with a neonatal pain assessment e-learning course. *Pain Management Nursing*. 2022. 23(5): 576-82. <https://doi.org/10.1016/j.pmn.2022.05.002>
- [28] Ulrich B. *Mastering precepting*. Sigma Theta Tau; 2023.
- [29] Hong, KJ., & Yoon, HJ. Effect of nurses' preceptorship experience in educating new graduate nurses and preceptor training courses on clinical teaching behavior. *International Journal of Environmental Research and Public Health*. 2021. (3): 975. <https://doi.org/10.3390/ijerph18030975>
- [30] Hookmani, AA., Lalani N., Sultan, N., et al. Development of an on-job mentorship programme to improve nursing experience for enhanced patient experience of compassionate care. *BMC nursing*. 2021. 1-8. <https://doi.org/10.1186/s12912-021-00682-4>
- [31] Tagele, TD., Berhe, YW., & Lema GF. Knowledge and attitude towards pediatric pain management among nurses at Ethiopian tertiary hospitals; a multi-center study. *BMC nursing*. 2023. 22(1): 84. <https://doi.org/10.1186/s12912-023-01234>
- [32] Kurz, S., Lohse, J., Buggenhagen H., et al. Improving competence and safety in pain medicine: a practical clinical teaching strategy for students combining simulation and bedside teaching. *BMC Medical Education*. 2021. 21: 1-7. <https://doi.org/10.1186/s12909-021-02554-6>

- [33] Ozawa, M., Yamashita, K., & Kawano, R. Effectiveness of a virtual program on nurses' pain-related knowledge and pain-measurement skills. *Pain Management Nursing*. 2022. 23(6): 720-7. <https://doi.org/10.1016/j.pmn.2022.07.002>
- [34] Gholamian, S., Alidoosti, K., Zolala, S., et al. The Effect of Implementing the Competency-Based Education Model on the Clinical Skills among Midwifery Students. *Strides in Development of Medical Education*. 2022. 19(1): 91-100. <https://doi.org/10.22062/sdme.2022.196652.1079>