


The Mediating Effect of Model-Based Learning on Attitude and Pain Management Awareness Among Nurses During COVID 19 Pandemic in Saudi Arabia

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Abstract

Background: All hospitals are required to provide high-quality pain management; one of the most critical issues in achieving high-quality pain management is that the hospitals have a clear plan to manage the patients' pain and improve the nurses' awareness of pain management during the COVID 19 pandemic. However, there is a significant gap in the literature that this study can cover.

Aim: This study aimed to investigate the mediating effect of model-based learning on nurses' attitudes toward nurses' pain management awareness during the COVID 19 pandemic in Saudi Arabia government hospitals.

Method: The Heath Beliefs Model was used, with a quasi-experimental design, with per experimental one group pre-test post-test design, and a quantitative approach using self-administered questionnaires obtained from 330 nurses working with patients suffering from pain. IBM SPSS V23 and Analysis of Moment Structures (AMOS)V23 were applied to analyze the causal relationships between the variables.

Results: A two-step approach to analyze the study: the first step was to test the measurement models' constructs' reliability and validity. The second step was to test research hypotheses in the structural models. The results show a significant positive relationship between model-based learning and pain management awareness among nurses during COVID 19 pandemic. Furthermore, model-based learning fully mediated the relationship between nurses' attitudes and pain management awareness.

Conclusions: The study successfully improved nurses' attitudes toward pain management awareness among nurses during COVID 19 pandemic. These findings will help strengthen the debate in the existing literature, and this is a new development window in the pain management area.

Keywords

pain management awareness, nurses attitude about pain management, model-based learning

Introduction

All hospitals are required to provide high-quality pain management. One of the most critical aspects of achieving high-quality pain management is that hospitals must have a comprehensive plan to enhance the pain management awareness among nurses and manage patient's pain during the peri-operative and postoperative recovery periods (Hayes & Gordon, 2018). The main objectives of this study are to evaluate the causal relationships between attitude and pain management awareness and examine the mediating effect of model-based learning on attitude and pain management

awareness among nurses during COVID 19 pandemic in Saudi Arabia (Figure 1). The COVID-19 pandemic is having a thoughtful impact on health care staff and patients

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with pain. Delaying or halting pain treatment during the COVID 19 epidemic can have significant downstream consequences on patients with pain, including increased pain and impairment (El-Tallawy et al., 2020).

Review of Literature

There is a positive relationship between patients satisfaction and control of pain. In California, Massachusetts, and New York hospitals, by revising the Hospital Consumer Assessment of Health Care Providers Systems (HCAHPS); The cross-sectional study Patient satisfaction from pain management is highly demanding in the number of staff nurses and nurses' responsibility of care and communication, the results showed hospitals with a high number of nurses and the non-profit have a high level of patient satisfaction from the pain control and the teaching hospitals with a high number of doctors low level of patients pain control (Shindul-Rothschild et al., 2017). Apart from using pain treatment from physicians and nurses using the medicine control, pain management is complex and requires nonpharmacological management from all health care staff. To efficiently manage pain, health care professionals should work together. It is essential for health care staff to have complete pain information and to be able to develop a pain management system to ensure that patients are not left untreated (Ung et al., 2016). Although a cross-sectional study was conducted in the United States among 147 American Association of Heart Failure Nurses to investigate pain management and pain management practice for heart failure patients, an online pain management survey in the study and 147 out of 2,100 participants participated with a response rate of 7%. The results revealed a gap in pain management practice among nurses and the importance of pain management awareness (Chen et al., 2019). Furthermore, in the United Kingdom (U.K.) and Ireland, the multidisciplinary team with a continuing nursing job is the proper way for pain management, in general, to deal with current and future challenges (Kailainathan et al., 2017). However, for adequate pain control, physicians and nurses must use a comprehensive approach to diagnose patients and be mindful of the various forms of pain, whether chronic or acute (Hay, 2019).

Furthermore, from the previous studies using learning is a vital method to find a solution for pain management problems. One research conducted in the Kingdom of Saudi Arabia in the critical care area to assess the impact of educational programmes on the nurses' knowledge and attitude toward pain management, and the results showed substantial improvement in the nurses' knowledge and attitude toward pain management (Issa et al., 2019).

Methods

This study used a quasi-experimental design with a one group pre-test post-test design, a quantitative methodology,

using self-administered questionnaires from 330 nurses working with patients suffering from pain. This study's population size was 2,200 nurses, according to the (Krejcie & Morgan, 1970) table, the sample size is 330 nurses. The instrument used for the model-based learning questionnaire was adopted from (Aiham et al., 2019). The constants of this section are the 5-points Likert questionnaire from 1–5; the higher scores indicated better to evaluate the effectiveness of the model-based learning its 13 questions about the different parts of the learning programme. Internal consistency for the model-based learning questionnaire was determined by Cronbach's alpha of 0.897. Although the nurses' attitude questionnaire constants of 18 questions were adopted (Niemi-murolo, 2007), all the questions focused on attitudes and beliefs towards pain management. The Reliabilities of the scales comprising the inventory was calculated using Cronbach's alpha 0.971. However, the pain management awareness survey included 21 items concerning participants' self-assessed satisfaction with pain management. The items scored using a 5-point Likert scale (1–5); higher scores indicated better self-assessed satisfaction with pain management awareness—Cronbach's alpha of 0.888.

Theoretical Framework and Learning Process

The Health Belief Model (HBM) is a theoretical framework designed to explore and test the sense behind initiating and maintaining health behaviours (Becker, 1974). It is a framework for motivating individuals to take the proper health actions by making them the primary motivation for avoiding an impaired health status. HBM and adopted for understanding, predicting, and explaining health care behaviours. The HBM suggests that people's beliefs about whether they are at risk of a health problem or not influence their readiness to take action. Furthermore, the HBM has not appropriately assumed the influence or emotions in changing safety behaviour. It has been well-recognized in the behavioural literature that both cognition (i.e., attitude, belief) affects intentions or behaviours (Wang, 2018).

The rationale of selecting the Health Belief Model in this study is its ability to running the research and providing a suited design or framework to understand and measure variables, which will produce the ability to measure the effect of mediation. HBM is one of the first models of health behaviour. The HBM is one of the most extensively approved psychosocial tools for describing, concluding, and adapting health-related behaviours.

HBM subsists of four core segments:

1. perceived susceptibility vs perceived severity.
2. perceived benefits vs perceived barrier
3. cues to action
4. self-efficacy

These learning strategies provide information to increase the nurses' sense of the seriousness of the pain. Furthermore, improving their attitude in the effectiveness of certain behaviours in protecting them from the negative consequences of pain management makes them believe they are comfortable taking actions to keep the patients free of pain. Two training strategies used together, Audio-Visual Strategy and Social Media Strategy to ensure the maximum benefits of improving nurses' pain management awareness level. To emphasize the reality of model-based learning, the researcher arranges sessions for the participants to generate the data they will discuss and evaluate during the programme. This type of learning helps to reflect the relevance of their current beliefs and attitudes and the ingrained practices in their working environments. Through minimal interactive group discussions with consideration for infection control precautions and social distancing, participants were facilitated to accept ownership of these beliefs and practices, identify the need for change, and precipitate change within themselves and their peers. This framework, combined with EDUManual (fourth edition, 2010) (Zacharoff et al., 2010), a comprehensive pain management source for health care providers forms the basis for model-based learning.

Based on the framework of the HBM, a nurse is more likely to adopt the following attitude and awareness about:

1. Choose the proper pain assessment scale.
2. Do pain assessment and reassessment on time.
3. Use nonpharmacological pain management methods.
4. Use the pain medications on time and according to hospital policy.
5. Do not 'leave any patient to have untreated pain.

Research Hypotheses

The following hypotheses were formulated to be tested (Figure 1).

H1: Attitude About Pain Management (APM) positively affects Pain Management Awareness (PMA).

H2: Nurse satisfaction of pain management Learning (L) positively affects pain management awareness (PMA).

H3: Attitude About Pain Management (APM) positively affects Nurse satisfaction of pain management Learning (L).

H4: Nurse satisfaction of pain management Learning (L) mediates the relationship between Attitude About Pain Management (APM) and Pain Management Awareness (PMA)

Research Result

Profile of the Respondents. This section presents a general profile of the respondents' demographic characteristics on six aspects, namely, gender, age, marital status, educational level, work

experience, and work area. As shown, Table 1 represents the frequencies and percentages of the demographical variables. Table 1 Summarizes the demographic profile of 330 nurses, including gender, age, marital status, education level, job location, experience, and working area. According to the Table 1, 70% of the participants are female, while the remaining 30% are male. In terms of age, 43.3% of nurse participants are between the ages of 25 and 34 then by 33.3% of nurses between 35 and 44. 13.3% of nurses are between 45 and 54, and 10% are under 25. 73.3% of the nurses married. 73.3% of all nurses hold a bachelor's degree or higher. 46.7 have 3–6 years of work experience. Finally, all of the respondents (100%) are staff nurses from 5 different areas.

Reliability analysis. Table 2 Shows the Alpha Value Reliability for the first-order constructs of pain management awareness as the dependent variable, nurses' attitude as the independent variable, and model-based learning as the mediating variable. The table indicates that all dependent, independent, and mediating variables have relatively high reliability, with Cronbach alpha range values ranging from 0.940 for nurses' attitudes toward pain control to 0.742 for pain management awareness.

Table 3 shows the Paired Sample T-test results for the first, second, and third times, between the dependent and independent variables. The mean values of all constructs changed significantly between baseline before training (1st time) and immediately after training completion (2nd time). The findings also reported substantial variations in the mean values of pain management awareness between immediately after the second time and three months later (3rd time). The findings showed that the mean values of Pain Management Awareness (PMA) and nurse Satisfaction with Pain Management Learning (L) improved significantly from the first to the second to the third time. According to the findings, the training was successful in raising the level of these constructs.

Table 4 displays the means and standard deviation of the constructs, assessed on a 5-point Likert scale:

Table 4 The mean was used as a measure of central tendency, and the mean values of all constructs were found to be higher than their midpoint level (3), as shown in Table 4. The anomaly indicated that the consensus respondents' interpretation of these constructs was more favourable than the national average. Nurses Self-Confidence (NSC) had the highest mean ranking, with a mean value of 3.772. Difficulties in Treating Pain (DTP) had the lowest mean ranking, with a mean value of 3.331. The standard deviation was used as a dispersion index to display how often individuals within each variable varied from the variable mean. The personal meaning of Supplemental Pain Management Self-Efficacy (SPMS) deviated the most from the mean (SD = 0.965) of the variables tested. This standard deviation showed that respondents' Supplemental Pain Management Self-Efficacy respondents' expectations were somewhat variable (SPMS).

- H1: APM → PMA
- H2: L → PMA
- H3: APM → L
- H4: APM → L → PMA

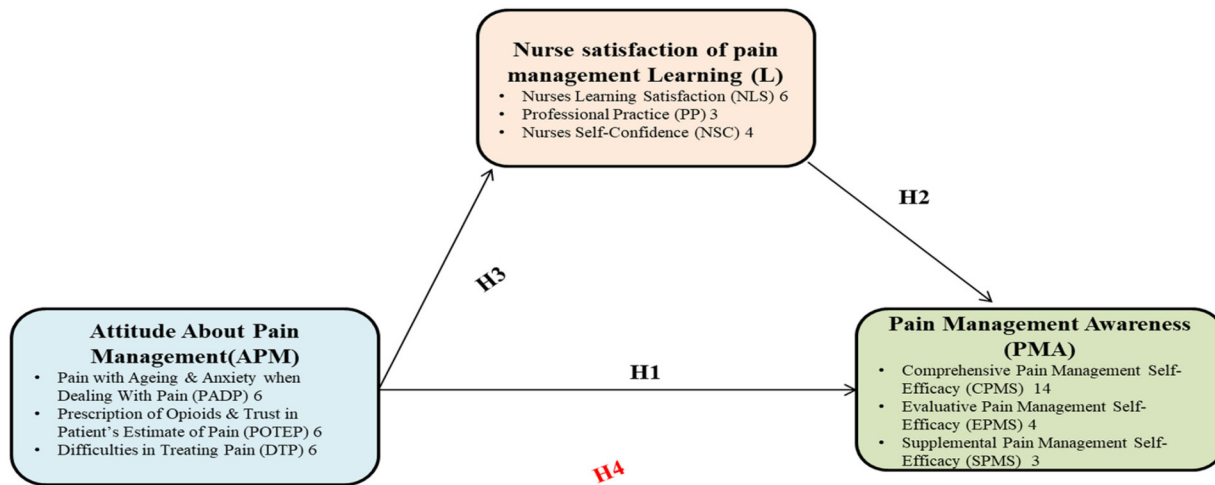


Figure 1. Research framework.

Table 1. Sample Profile.

Group	Frequency	Percentage
Gender		
Male	99	30.0
Female	231	70.0
Age		
Less than 25 years	33	10.0
25–34 years	143	43.3
35–44 years	110	33.3
45–54 years	44	13.3
Marital status		
Single	88	26.7
Married	242	73.3
Educational level		
diploma/high diploma	66	20.0
Bachelor	242	73.3
Master	22	6.7
Working experience		
Less than 3 years	22	6.7
3–6 years	154	46.7
7–10 years	110	33.3
11–14 years	44	13.3
Area		
Medical ward	55	16.7
Surgical ward	44	13.3
Oncology ward	55	16.7
ICU	77	23.3
ER	55	16.7
OR	44	13.3

Structural models. The structural model explains the variables' relationships. It depicts the relationship between the independent or exogenous variables and the dependent variables endogenous variables. The overall model fit was evaluated first, followed by the scale, position, and significance of the hypothesized parameter estimates (Hair et al., 2006).

Table 2. Results of Reliability Tests upon the Feedback from 30 Respondents as Pilot Study.

Ist order constructs	Item number (52)	Internal reliability (Cronbach Alpha)
Pain with Ageing & Axiety when Dealing With Pain (PADP)	6	0.940
Prescription of Opioids & Trust in Patient's Estimate of Pain (POTEP)	6	0.915
Difficulties in Treating Pain (DTP)	6	0.929
Comprehensive Pain Management Self-Efficacy (CPMS)	14	0.805
Evaluative Pain Management Self-Efficacy (EPMS)	4	0.800
Supplemental Pain Management Self-Efficacy (SPMS)	3	0.742
Nurses Learning Satisfaction (NLS)	6	0.782
Professional Practice (PP)	3	0.780
Nurses Self-Confidence (NSC)	4	0.893

Table 3. Results of Paired Sample T-Test Between 1st, 2nd & 3rd Times.

	Cronbach Alpha			Mean			Mean difference 1 st – 2 nd			Mean difference 2 nd – 3 rd		
	1 st time	2nd time	3rd time	1st time	2nd time	3rd time	Δ^{1-2}	T-value	P-value	Δ^{2-3}	T-value	P-value
APM	0.926	0.895	0.929	3.600	3.453	3.403	0.147***	14.759	0.000	0.050*	2.467	0.014
PMA	0.971	0.728	0.966	2.500	3.576	3.709	-1.076***	-17.771	0.000	-0.133*	-2.428	0.016
L	0.710	0.727	0.919	3.151	3.629	3.720	-0.478***	-20.084	0.000	-0.091**	-2.801	0.005

Note: *p < 0.05; **p < 0.01; ***p < 0.001; df = degree of freedom = 329; APM = attitude about pain management; L = nurse satisfaction of pain management learning; PMA = pain management awareness.

In this analysis, the structural model was calculated using AMOS and the maximum likelihood estimate (MLE) technique to evaluate the research hypotheses.

The following section discusses the results of path analysis with the above hypotheses in the structural model:

H1: Attitude About Pain Management (APM) has a significant positive effect on Pain Management Awareness (PMA)

As shown in Table 5, the results indicated no significant direct relationship between Attitude About Pain Management (APM) and (PMA). Thus, *H1 was rejected*.

H2: Nurse satisfaction of pain management Learning (L) has a significant positive effect on Pain Management Awareness (PMA)

The critical ratio (c.r.) and p-value of Nurse satisfaction of pain management Learning (L) in predicting (PMA) were 3.088 and 0.002, respectively. It follows that the likelihood of obtaining a critical ratio as large as 3.088 in absolute value is 0.002. That is to say, the

regression weight for Nurse satisfaction of pain management Learning (L) in the prediction of (PMA) at the 0.01 level, significantly different from zero (two-tailed). As a result, *H2 was approved*. Furthermore, the standardized estimate of Beta was 0.225, indicating that the relationship was positive. It means, when Nurse satisfaction with pain management Learning (L) goes up by one standard deviation, (PMA) goes up by 0.225 standard deviations.

H3: Attitude About Pain Management (APM) has a significant positive effect on Nurse satisfaction of pain management Learning (L)

The critical ratio (c.r.) and p-value of (APM) in predicting Nurse satisfaction of pain management Learning (L) were 3.343 and 0.000, respectively. It follows that the chance of obtaining a critical ratio as large as 3.343 in absolute value is 0.000. That is to say, the regression weight for (APM) in the prediction of Nurse satisfaction of pain management Learning (L) at the 0.001 level is significantly different from zero (two-tailed). As a result, *H3 was approved*. Furthermore, the standardized estimate of Beta was 0.257, indicating that the relationship was positive. It means, when (APM) goes up by one standard deviation, Nurse satisfaction of pain management Learning (L) goes up by 0.257 standard deviations.

H4: Nurse satisfaction of pain management Learning (L) mediates the relationship between Attitude About Pain Management (APM) and Pain Management Awareness (PMA)

According to Table 6, there was a significant relationship between (APM) and (PMA) in the absence of Nurse satisfaction of pain management Learning (L), with the standardized total impact of 0.169 and the P-value of 0.039. Thus, the actual effect of (APM) as IV on (PMA) as DV without the inclusion of Nurse satisfaction of pain management Learning (L) as M was statistically significant at 0.05 level. After implementing Nurse satisfaction in pain management Learning (L) into the model, this relationship became insignificant; thus, the direct effect of 0.111 and the P-value of 0.195. Therefore, the immediate impact of (APM) as IV on (PMA) as DV with the inclusion of Nurse satisfaction of pain management Learning (L) as M was not statistically significant.

Table 4. Results of Descriptive Statistic for Variables.

Constructs	Mean	Standard deviation	Min Max	
			Min	Max
Attitude About Pain Management (APM)	3.388	0.770	1.3	4.7
Pain with Ageing & Anxiety when Dealing With Pain (PADP)	3.428	0.904	1	5
Prescription of Opioids & Trust in Patient's Estimate of Pain (POTEP)	3.404	0.934	1	5
Difficulties in Treating Pain (DTP)	3.331	0.877	1	4.8
Pain Management Awareness (PMA)	3.668	0.811	1.2	4.8
Comprehensive Pain Management Self-Efficacy (CPMS)	3.748	0.880	1.3	4.7
Evaluative Pain Management Self-Efficacy (EPMS)	3.688	0.964	1	5
Supplemental Pain Management Self-Efficacy (SPMS)	3.591	0.965	1	5
Nurse satisfaction of pain management Learning (L)	3.720	0.708	1.2	4.7
Nurses Learning Satisfaction (NLS)	3.663	0.798	1	4.8
Professional Practice (PP)	3.744	0.838	1	5
Nurses Self-Confidence (NSC)	3.772	0.848	1	5

Table 5. Examining Results of Hypothesized Direct Effects of the Constructs.

Path	Unstandardized estimate		Standardised estimate Beta	critical ration (c.r.)	P-value	Hypothesis result
	Estimate	S.E.				
APM→PMA	0.106	0.069	0.111	1.523	0.128	H1) Rejected
L→PMA	0.26	0.084	0.225**	3.088	0.002	H2) Supported
APM→L	0.211	0.063	0.257***	3.343	0.000	H3) Supported

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

As depicted in Table 6, the impacts of (APM) as IV on Nurse satisfaction of pain management Learning (L) as M was statistically significant at 0.01 level, with the standardized effects of 0.257. The effects of Nurse Satisfaction of Pain Management Learning (L) as M on (PMA) as DV, on the other hand, were statistically significant at the 0.05 level, with standardized effects of 0.225. These results indicated that Nurse satisfaction with pain management Learning (L) mediates the relationship between (APM) and (PMA). The degree of mediation was complete because the paths a' (direct effect) were not statistically significant. The occurrence *supported hypothesis H4*.

Further, the result revealed that (APM) had a significant indirect positive effect on (PMA) through Nurse satisfaction of pain management Learning (L) with the standardized indirect effect of 0.058, p -value = 0.009.

Discussion

Based on the study results, the most crucial attribute of this study is that the model-based learning made a significant change in nurses' attitudes and pain management awareness among nurses. They explained the significant relationship between model-based learning and nurses' attitude.

Table 6. Results of Examining Mediation Effects of Nurse Satisfaction of Pain Management Learning (L).

DV = Pain Management Awareness (PMA) M = Nurse satisfaction of pain management Learning (L)	Attitude About Pain Management (APM)
Total effect of IV on DV without M (path a)	0.169* (sig:0.039)
Direct effect of IV on DV with M (path a')	0.111 (sig:0.195)
Indirect effect of IV on DV through M (path bc)	0.058** (sig:0.009)
Effect of IV on M (path b)	0.257** (sig:0.002)
Effect of M on DV (path c)	0.225* (sig:0.030)
Mediation path	APM→L→PMA
Mediation effect	Yes
Degree of mediation	Full
Hypothesis result	H4)Supported

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

The results showed there was no significant direct relationship between attitude and pain management awareness. It is considered a new contribution to the pain management field. Limited empirical research has been conducted in order to develop a better understanding of them as well as to examine their relationship. This study explored the validity of earlier findings and identified some new essential variables by taking a more systemic approach. The results do not support the direct effect of attitude and pain management awareness. At the same time, these findings replicate similar patterns in previous studies. One across the sectional study was conducted in Canada among different healthcare workers to check and compare pain management knowledge, attitude, and behaviour in evidence-based practice between doctors, nurses, and other healthcare workers; the results showed that all the participants had a good level of pain management knowledge, the nurses had the highest pain management level, and the attitude level is almost the same among all participants (Grewal, 2018). In line with this study results, an explanatory sequential mixed-methods study was done in Swiss to clarify the most critical points to increase the understanding of pain management barriers among Swiss nursing homes. It was a cross-sectional study with COM-B model mixed methods; the survey was distributed to 343 nurses. The results show the problem of improving pain management awareness. It has summarized into major concepts firstly increases the knowledge and communication skills to change pain management practice and secondly improves attitude and behaviour toward pain management. The recommendations about the best way to enhance the knowledge, communication skills, and attitude to improve pain management are education and training strategies (Brunkert et al., 2020).

The literature supported the findings of the relationship between attitude and learning. In Toronto, Canada, online educational strategies about cancer pain management can improve nurses' knowledge and practice in pain management (Perri et al., 2016). One study in Australia supported these results per post-design research to assess the effect of a focused educational pain management module to improve the attitude, knowledge, and beliefs among health care workers. After 12 weeks of clinical education, the result showed significant improvement in the knowledge, attitude,

and beliefs among health care workers towards pain management, the instrument used in the study Neurophysiology of Pain (NPQ) Questionnaire and Health Care Providers Pain and Impairment Relationship scale (HC-PAIRS) (Fitzgerald et al., 2018).

Lack of studies investigates the mediating effect of model-based learning on nurses' attitudes and pain management awareness among nurses during the COVID 19 pandemic. Many previous studies have studied the impact of various approaches to pain educational programmes on nurse's attitudes toward pain management. In the United States, Washington, one research was a mixed-methods, descriptive cross-sectional design conducted in two centres that recruited more than 100 nurses. The results revealed that nurses are often busy and are unable to perform optimal levels of pain management. Organizations must infuse evidence-based practice with training and education to improve pain management levels among nurses (Eaton et al., 2017).

The study results indicated that Nurse satisfaction with pain management Learning mediates the relationship between Attitude About Pain Management and Pain Management Awareness. Parallel to these findings in previous studies, they need quality and educational improvement programmes to enhance the nurses' attitude regarding pain management; This finding present in a qualitative study was done in Canada among ICU nurses in a public hospital (Tsang et al., 2019). Moreover, a qualitative descriptive study was conducted among 17 faculty members from 15 nursing programmes in the United States to examine the perspectives of teaching pain management in nursing programmes. The findings revealed that the teaching process in the nursing faculty covering the fundamentals of pain management is insufficient to enhance nurses' knowledge of pain management recommendations to incorporate more specialized pain management education services for nursing faculty (Campbell, 2019).

Furthermore, in a qualitative study of 48 critical care nurses in Finland, video education successfully improved nurse awareness and skills about pain assessment and management (Björn et al., 2017). However, in Spain, another mixed method design study was conducted to evaluate the level of pain knowledge among health care workers in health care centres and identify the effects of a web-based educational programme to improve the health care workers' level of pain knowledge; the study was implemented in three phases, the first of which was to identify the level of pain knowledge, the second of which was to create and maintain the level of pain knowledge and start the educational programme, the educational programme, and the level of pain knowledge assessed in the final phase; the results showed an increase in misbelief, attitude, and knowledge among health care staff (García-martínez et al., 2019).

In summary, the theoretical components making up the concept of attitude and learning impact the nurses' awareness toward pain management, and this point has rarely received

much research attention. The present study has determined which of these components actively play a role in pain management awareness in making a unique contribution to this field of research. In particular, learning; is significantly influencing pain management awareness among nurses.

Strengths of the Research

The data generated from this study provide essential information that can help in decision making for leaders. The inferential statistical analysis for numeric data helps to understand and derive important facts, providing insight into intervention effectiveness and decision-making. Many research designs could be employed to obtain results and grab conclusions. However, the quasi-experimental group pre-post design used in this research can be weighted in the strengths of this study, mainly because it is conceptually easier to associate any observed effect to the interventions being tested or compared. The quasi-experimental design provides reliable results because of its considerable ability to control the covariates that could affect the results and conclusions. As the population under study was nurses working in governmental hospitals, this study permitted understanding the connection between the people, individual characteristics, and individual treatment responses. This study provides a new module that can be replicated and applied in other hospitals to improve pain management awareness. The provision of a tested new educational module that can be provided using different strategies can be considered one of this study's strength.

Limitations of the Study

This study was limited to nurses and did not include any other health occupational group (physicians, pharmacists, technicians). Thus the results can be generalized only to staff nurses working in governmental hospitals. However, the methodology can be replicated in other areas and for a different population. Another limitation is that the intervention strategy and implementation made blind group assignment difficult for the nurses working in the participating wards of this study and the researcher. Nevertheless, the same interventions were applied in different hospitals to avoid any chances of possible contamination.

Implication for Practice

The findings of this study will support nurse managers in devising strategies to increase pain management awareness among nurses and enhance patient outcomes. The managers and hospital administration should use Model-based learning to improve the pain management awareness among nurses reflected in the hospitals and community. This study will repair the disparity in the empirical and theoretical literature toward nurse's pain management awareness. It will add to the

literature on the relationship between model-based learning and nurses' attitudes toward pain management awareness. It will be a profit to the current research on pain management studies during and after the pandemic.

Conclusion

The study successfully improved nurses' attitudes toward pain management awareness among nurses during COVID 19 pandemic. According to the findings, the (APM) had a significant indirect positive effect on (PMA) through Nurse satisfaction of pain management learning (L). That is a new development window in the pain management area. It is an excellent opportunity for all hospital administrations to start using model-based learning as the basis of educational initiatives.

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Authors' Contribution

All authors have contributed significantly, and that all authors agree with the content of the manuscript.

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Ethical Approval

IRB Registration Number with KACST, KSA H-01-R-053, IRB Registration Number U.S. Department of HHS JORG # JORG0010374. Study Reference No: H1RI-26-Jan20-05.

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