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Effectiveness of a Nurse-led Pain Management Training Program on Knowledge, Attitude and Practice of Nurses in Ilorin, Kwara State, Nigeria

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Abstract:

Background:

Pain is one of the most common symptoms experienced by over two-thirds of patients globally. It was estimated that one out of every five adults experiences severe pain, while one out of every 10 adults is diagnosed annually with chronic pain.

Objective:

The study determined the effectiveness of a nurse-led pain intervention strategy among nurses in two selected hospitals in Kwara State, Nigeria.

Methods:

The study utilized a pre-and post-test non-randomized quasi-experimental research design consisting of two groups, with both groups receiving the intervention and a comparison made to assess the effectiveness of the intervention. A multistage sampling technique was employed to select 121 participants. Data was obtained using an adapted questionnaire, while descriptive and inferential statistics were used for data analysis.

Results:

Generally, the study findings revealed significantly lower knowledge scores among the participants before the intervention compared to those after the intervention. This observation was irrespective of the two hospitals (p= 0.000). Among the socio-demographic characteristics of the participants in Hospital A, only gender was observed to be significantly associated (X^2= 6.022, p= 0.014) with knowledge level before intervention. Attitude and pain management practice was good in the two hospitals in both the pre-and post-tests.

Conclusion:

Therefore, all healthcare institutions should observe regular training and seminars on pain assessment and management to improve patient care and ensure optimal pain management outcomes.

Keywords: Attitude, Knowledge, Intervention, Nurses and pain management, Practice, SPSS.

1. INTRODUCTION

Pain is one of the most common symptoms experienced by an estimated 79% of patients [1, 2]. Globally, it is estimated that one out of every five adults experiences severe pain, while one out of every 10 adults is diagnosed with chronic pain annually [3, 4]. Consequently, pain is the most common reason for seeking medical attention [5].

Pain management practices are defined as a set of activities carried out by nurses and other healthcare professionals to

manage a patient's pain [6] effectively. These activities include assessing patients' pain, providing appropriate nursing interventions to relieve the pain, and evaluating afterwards to know if the nursing action has solved the patient's pain [7]. As stated by Hua *et al.* [8], healthcare pain management practices are affected by three major barriers, which are; patients' barriers, organizational barriers, and healthcare providers' barriers.

Although nurses are not the only healthcare providers responsible for managing patients' pain, they are crucial since they are in a central position between the responsible physicians and their patients [9]. Nurses play a critical role in

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pain management; hence they must be well-versed in all types of pain management. Nurses make up the majority of the healthcare staff in most settings and have direct contact with patients 24 hours a day and seven days a week [10].

Inadequate pain management has been shown to affect patient outcomes by potentially increasing hospital stays and delaying recovery. Thus, the management of pain has major nursing implications [11]. Thus, nurses with good knowledge and positive attitude would have better pain management, improved outcomes, higher patient satisfaction scores, and reduced hospital stays. However, inadequate pain management is evident across all ages [12]. Uncontrolled pain (pre-or posto perative) may result in significant clinical, psychological, and socioeconomic consequences [13]. Studies [14 - 16] on the causes and consequences of inadequate management of acute pain indicated that treatment of acute pain remains suboptimal due to the attitudes of both the health personnel and patients.

To achieve the required efficiency, one must recognize the barriers to effective pain management, and these include both physician/nursing-related barriers and patient-related barriers [13, 17]. Inadequate knowledge of pain assessment and management by nurses may be improved *via* an organized training program that will include better patient pain assessment and using different pharmacological and non-pharmacological measures to relieve pain. Hence, this study assessed the effectiveness of a pain management training program for nurses in two selected hospitals in Ilorin, Kwara State, Nigeria.

2. METHODOLOGY

2.1. Research Design and Setting

The study utilized a pre-and post-test non-randomized quasi-experimental research design consisting of two groups of nurses selected from different hospitals, with both groups receiving the intervention and a comparison made to assess the effectiveness of the intervention. The research aimed to determine the effect of training on nurses' knowledge, attitude, and practice in pain management. The design involved the comparison of participants before and after implementing the training programme. It also involved the collection of baseline data that allowed the researcher to be relatively confident, inferring that post-test differences would occur as a result of the intervention; thus, the design was deemed appropriate for this study.

Nurses were recruited from two government-owned health facilities in Ilorin, Kwara State, Nigeria. The two hospitals are referred to as Hospitals A and B in this study. Hospital A is a secondary healthcare institution providing out-patient and in-patient services. Other services provided included but are not limited to medical, surgical, and dental services, amongst others. While Hospital B is a government-owned secondary healthcare institution that provides both out-patient and in-patient activities, medical and surgical services, with dental services, amongst others.

The target population for the study were nurses working in Hospitals A and B, with a total of 152 nurses, consisting of 104 and 48 from Hospitals A and B, respectively. The sample size

was estimated using Slovin's formula [18]. After factoring in the 10% attrition rate, the total sample size was 121. The samples consisted of 83 and 38 participants from Hospitals A and B, respectively.

The multistage sampling technique with three stages was adopted for the study. In stage one, a simple random sampling technique was used to select two out of three local government areas in the study setting, and one hospital each was selected from the two local government areas, making a total of two hospitals. In stage two, a stratified sampling technique was used to select 83 and 38 nurses from the two selected hospitals using the total number of nurses. The convenience sampling technique was used in the third stage to recruit the required number of participants. The inclusion criteria for the study include being a registered nurse or midwife; they must have practiced for at least a year and worked in the selected hospitals. Registered nurses or midwives with prior pain management training were excluded from the study.

The instrument for data collection was a questionnaire adapted from similar studies [12, 19 - 21]. The instrument was modified so as to evaluate the content to know if it reflects the concepts/objectives of the study. The content validity was also measured after a thorough literature review, and the questionnaire was also given to experts in the field of pain management for their corrections and improvement. The test-retest approach was used to determine the data's dependability. After the expert review, to ensure its reliability, the tool was completed by 15 nurses. The results were, however, not added to the final data presentation. Also, the reliability coefficient was measured to test for internal consistency. The data collected was analyzed, and Cronbach's alpha value of 0.7 and above was accepted as reliable. The modified questionnaire consisted of 60 items that cut across the subscales of Nurse Knowledge, Attitude, Survey, and Practice (NKAS) on pain. Sections A and B of the questionnaire consisted of the participants' demographical characteristics and 25 knowledge questions, based on 'Yes' or 'No' responses, with a total range of 0–25 points. The scores were converted into percentages, and participants with scores below 50% were categorized as having inadequate knowledge, while those with scores above 50% had adequate knowledge. Section C was on attitudinal disposition with a total of 20 questions on a four-point Likert Scale from strongly agree, which equals 4, to strongly disagree, which is 1, and the total score ranges from 20 to 80. The scores were also converted into percentages; scores below 50% were categorized as poor, while those above 50% were good attitudes. Section D consisted of 15 questions on the practice of pain management using Likert scales of 1-4 with a total score of 60 points.

2.2. Data Collection for the Intervention Programme

After ethical permission, directors of Nursing Services in the two selected hospitals were contacted; three nurses were chosen and trained in each facility to serve as research assistants in the data collection process, which involved three stages (pre-intervention, intervention, and post-intervention). Nurses working in different units of the hospital participated in the study. For this study, the two groups took the same pretest

to establish the initial baseline data, thus identifying gaps in knowledge, attitude, and practice level of pain management in both hospitals. After identifying the gaps, both groups undertook a short training session on pain management. Finally, the two groups took the same post-test four weeks after the training. This was conducted to determine the effectiveness of the intervention and to know if the intervention actually made a difference in the knowledge, attitude, and practices of the nurses in the management of patients' pain. The comparative effectiveness of the intervention was then evaluated by comparing the observed transformation between the pre-and post-tests of the two groups. Data were collected from October to December 2021.

2.3. Procedures

After agreeing on a date with the directors of both hospitals, the researchers met with the targeted participants, and written informed consent was obtained from the nurses during the first visit. The researchers discussed the study's objectives, goals, and benefits and four stages of training with the participants. During the first session, which was the first week, participants were introduced to the study and the pretest was administered. This was conducted to examine the participants' preintervention knowledge of pain assessment and non-pharmacological as well as pharmacological pain management.

The second session, which was the teaching/training session, spanned from the second to the fifth week. The teaching session involved extensive training on the knowledge, attitude, and management of pain. The researchers also talked about the different types of pain, such as incident, breakthrough, and procedural pain, and how to employ rescue doses to change daily opioid doses based on rescue dose requirements. Participants were also trained on how to recognize and treat different types of pain. Audio-visual lectures were provided in the hospital conference halls. The entire session was divided into four modules that were taught on separate occasions to ensure extensive teaching as well as communication of ideas between the researcher and participants. Each session lasted for an average of two hours. To facilitate the learning process, the training is also comprised of specific methods such as role-playing, simulation, and case studies.

The third session (the sixth and seventh week) was about the importance of pain evaluation (using various instruments) and the World Health Organization analgesic ladder, which was used to review and discuss pharmacological treatment options for mild, moderate, and severe pain. The non-pharmacological pain management techniques were also covered, the session also lasted for about 2 hours, and participants' questions were adequately answered.

The final session occurred in the eighth week. Previous teaching and exercises were extensively reviewed. In this session, the researcher also educated the participants on various types of adjuvants/co-analgesics, analgesic side effects and toxicity, pain therapy in children, the elderly, patients with dementia, sickle cell disease, addiction, and dependence. Finally, the evaluation session occurred between the eleven and

twelfth weeks, and postintervention tools were used to assess the training session's success in terms of the participant's knowledge, attitude, and pain management practice.

2.4. Data Analysis

Data were analyzed using the Statistical Package for Social Science (SPSS) software version 25. Data were presented using descriptive and inferential statistics. Comparisons of means were carried out using the One-Way Analysis of variance, while tests of associations were carried out using Chi-Square.

2.5. Ethical considerations

Before commencing the study, ethical approval was obtained from the Research and Ethics Committee of the Kwara State Ministry of Health, Ilorin, Kwara State, Nigeria, with protocol number: ERC/MOH/2021/12/012. In addition, approval was obtained in each of the respective hospitals where the study was carried out. In addition, throughout the research process, steps were implemented to ensure the study complied with the ethical principles of research. Participants' rights were explained to each participant, and none was coerced into participating in the study. Moreover, informed consent was obtained from all participants willing to participate in the study. All the information provided by the participants was treated with utmost confidentiality, and the participants' identities were not revealed to anybody at any point in time throughout the period of study.

3. RESULTS

3.1. Socio-demographic Profile of the Study Participants

The socio-demographic profile of the study participants revealed that most participants were within the age range of 21-30 (56.6%) in Hospital A and 31-40 years (42.1%) in Hospital B. The majority of the participants were females (84.3% in Hospital A and 81.6% in Hospital B). With respect to the area of nursing care, 34.9% of them worked in medical or emergency/trauma wards in Hospital A, while 26.3% and 21.1% of participants in Hospital B worked in medical and emergency/trauma wards, respectively (Table **1**).

In addition, over 80% of the participants in both hospitals had either a diploma or bachelor's degree in nursing, while only a few had postgraduate qualifications. Moreover, 22.9% and 44.7% were principal nursing officers. In the case of work experience, 43.4% of participants in Hospital A had 1-5 years of working experience, while 29.5% of those in Hospital B had 11-15 years of experience (Table **1**).

3.2. Participants' Knowledge of Pain Management

With respect to participants' knowledge level of pain management, 45.8 and 21.1% of participants had adequate knowledge of pain management before the intervention, but after the intervention, 100 and 92.1% of participants had adequate knowledge of pain management in Hospitals A and B, respectively. Among the socio-demographic characteristics of the participants in Hospital A, only gender was observed to be significantly associated (X^2= 6.022, p= 0.014) with knowledge level before intervention. There was, however, no significant

association between the demographic profile of participants in Hospital B and the knowledge level of pain management before intervention. In both hospitals, none of the demographic characteristics of the participants showed any significant association with the knowledge level of pain management after intervention (Tables **2** and **3**).

Table 1. Demographic profile of the study participants.

Items	-	Hospital A		Hospital B	
-	-	**Frequency**	**%**	**Frequency**	**%**
Age (years)	21-30	42	56.6%	6	15.8%
	31-40	23	27.7%	16	42.1%
	41-50	10	1.0%	8	21.1%
	51-60	8	9.6%	8	21.1%
Gender	Male	13	15.7%	7	18.4%
	Female	70	84.3%	31	81.6
Ethnicity	Yoruba	71	85.5%	29	76.3%
	Ibo	4	4.8%	2	5.3%
	Hausa	5	6.0%	3	7.9%
	Others	3	3.6%	4	10.5%
Marital Status	Married	48	57.8%	30	78.9%
	Divorce/separated	5	6.0%	0	0
	Widow	1	1.2%	2.	5.3%
	Single	21	34.9%	6	15.8%
Religion	Christianity	39	47.0%	20	52.6%
-	Islam	44	53.0%	18	47.4%
Nursing Specialty	Medical	29	34.9%	10	26.3%
	Surgical	7	8.4%	7	18.4%
	Oncology	2	2.4%	2	5.3%
	Emergency/Trauma	29	34.9%	8	21.1%
	Midwifery	16	19.3%	11	28.9%
Educational Qualification	Diploma	40	48.2%	11	28.9%
	Bachelor degree	36	43.4	21	55.3%
	Postgraduate degree	7	8.4	6	15.8
Work Experience (years)	1-5	26	43.4%	4	10.5%
	6-10	22	26.5%	7	18.4%
	11-15	15	18.1%	15	29.5%
	16-20	7	8.4%	4	10.5%
	Above 20	3	3.6%	8	21.1%

Table 2. Knowledge level of pain management of participants in hospital A, before and after intervention.

Items	-	Before Intervention				After Intervention			
-	-	Knowledge Level				Knowledge Level			
-	-	**A**	**B**	**X²**	**p**	**A**	**B**	**X²**	**p**
Age (years)	21-30	22	20	.452	.929	0	41	-	-
	31-40	12	11			0	21		
	41-50	6	4			0	9		
	51-60	5	3			0	12		
Gender	Male	3	10	6.022	.014	0	14	-	-
	Female	42	28			0	69		
Ethnicity	Yoruba	40	31	3.777	.287	0	73	-	-
	Ibo	2	2			00	3		
	Hausa	3	2			0	4		
	Others	-	3			0	3		

(Table 2) contd.....

Items	-	Before Intervention				After Intervention			
-	-	Knowledge Level				Knowledge Level			
-	-	A	B	X^2	p	A	B	X^2	p
Marital status	Married	28	20	1.992	.574	0	49	-	-
	Divorce/Separated	2	3			0	3		
	Widowed	1	0			0	1		
	Single	14	15			0	30		
Religion	Christianity	19	20	.896	.344	0	39	-	-
	Islam	26	18			0	44		
Nursing Specialty	Medical	17	12	3.444	.486	0	30	-	-
	Surgical	5	2			0	6		
	Oncology	1	1			0	3		
	Emergency/trauma	12	17			0	28		
	Midwifery	10	6	-	-	0	16		
Qualification	Diploma	19	21	1.808	.405	0	40	-	-
	Bachelor degree	21	15			0	36		
	Postgraduate	5	2			0	7		
Work Experience (years)	1-5	16	20	2.820	.588	0	34	-	-
	6-10	13	9			0	21		
	11-15	9	6			0	16		
	16-20	5	2			0	7		
	Above 20	2	1			0	5		
Knowledge level (%)		**54.2**	**45.8**	**-**	**-**	**0**	**100**	**-**	**-**

Note: 'A' and 'B' represent inadequate and adequate knowledge, respectively. X^2 and p represent Chi-square and probability values, respectively.

Table 3. Knowledge level of pain management of participants in 'hospital A', before and after intervention.

Variables	-	Before Intervention				After Intervention			
-	-	Knowledge Level				Knowledge Level			
-	-	A	B	X^2	p	A	B	X^2	p
Age (years)	21-30	5	1	.647	.886	0	8	4.601	.203
	31-40	12	4	-	-	1	13	-	-
	41-50	6	2	-	-	2	6	-	-
	51-60	7	1	-	-	0	8	-	-
Gender	Male	4	3	2.455	.117	0	7	.735	.391
	Female	26	5	-	-	3	28	-	-
Ethnicity	Yoruba	23	6	1.848	.605	2	27	3.224	.358
	Ibo	1	1	-	-	0	2	-	-
	Hausa	3	0	-	-	1	2	-	-
	Others	3	1	-	-	0	4	-	-
Marital Status	Married	24	6	1.098	.578	3	28	.735	.692
	Divorce/separated	-	-	-	-	-	-	-	-
	Widowed	1	1	-	-	0	2	-	-
	Single	5	1	-	-	0	5	-	-
	Religion	-	-	-	-	-	-	-	-
Religion	Christianity	17	3	.931	.335	2	19	.171	.679
	Islam	13	5	-	-	1	16	-	-
Nursing Specialty	Medical	7	3	2.275	.685	0	10	6.264	.180
	Surgical	5	2	-	-	0	6	-	-
	Oncology	2	0	-	-	0	1	-	-
	Emergency/ trauma	6	2	-	-	0	8	-	-
	Midwifery	10	1	-	-	3	10	-	-
Qualification	Diploma	9	2	.220	.896	1	10	.744	.690
	Bachelor degree	16	5	-	-	2	18	-	-
	Postgraduate	5	1	-	-	0	7	-	-

(Table 3) contd.....

Variables	-	Before Intervention				After Intervention			
-	-	Knowledge Level				Knowledge Level			
-	-	A	B	X^2	p	A	B	X^2	p
Working Experience (years)	1-5	3	1	2.967	.563	0	5	1.938	.747
	6-10	4	3	-	-	0	5	-	-
	11-15	13	2	-	-	2	13	-	-
	16-20	3	1	-	-	0	4	-	-
	Above 20	7	1	-	-	1	8	-	-
Knowledge level (%)		78.9	21.1	-	-	-	7.9	92.1	-

Note: 'A' and 'B' represent inadequate and adequate knowledge, respectively. X^2 and p represent Chi-square and probability values, respectively.

Table 4. Attitude level of the participants 'Hospital A 'to pain management before and after intervention.

Variables	-	Before Intervention				After Intervention			
-	-	Poor	Good	X^2	p	Poor	Good	X^2	p
Age (years)	21-30	1	41	.988	.804	1	40	1.037	.972
	31-40	0	23	-	-	0	21	-	-
	41-50	0	10	-	-	0	9	-	-
	51-60	0	8	-	-	0	12	-	-
Gender	Male	0	13	.118	.665	0	14	.205	.650
	Female	1	69	-	-	1	68	-	-
Ethnicity	Yoruba	1	70	.171	.982	1	72	.131	.987
	Ibo	0	4	-	-	0	3	-	-
	Hausa	0	53	-	-	0	4	-	-
	Others	0	3	-	-	0	3	-	-
Marital Status	Married	1	47	.738	.864	0	49	1.788	.618
	Divorce/separated	0	5	-	-	0	3	-	-
	Widowed	0	1	-	-	0	29	-	-
	Single	0	29	-	-	1	29	-	-
Religion	Christianity	0	39	.897	.344	1	38	1.142	.289
	Islam	1	43	-	-	0	44	-	-
Nursing Specialty	Medical	0	29	1.885	.759	1	29	1.788	.775
	Surgical	0	7	-	-	0	6	-	-
	Oncology	0	2	-	-	0	3	-	-
	Emergency/trauma	1	28	-	-	0	28	-	-
	Midwifery	0	16	-	-	0	16	-	-
Qualification	Diploma	1	39	1.088	.580	1	39	1.088	.580
	Bachelor degree	0	36	-	-	0	36	-	-
	Postgraduate	0	7	-	-	0	7	-	-
Work Experience (years)	1-5	1	35	1.321	.858	1	33	1.459	.834
	6-10	0	22	-	-	0	21	-	-
	11-15	0	15	-	-	0	16	-	-
	16-20	0	7	-	-	0	7	-	-
	Above 20	0	3	-	-	0	5	-	-
Attitude level (%)		1.2	98.8	-	-	1.2	98.8	-	-

Note: X^2 and p represent Chi-square and probability values, respectively.

3.3. Participants' Attitude and Practice of Pain Management

Generally, almost all participants in both hospitals (98.8% in Hospital A and 97.4% in Hospital B) were observed to have a good attitude towards pain management before and after the intervention. None of the participants' demographic characteristics showed a significant association with attitude to pain management. This observation was irrespective of the participants in the two hospitals used for the study (Tables **4** and **5**).

With respect to the practice of pain management, the study findings revealed that almost all participants had good practice. This observation was irrespective of pain management practice in the two hospitals and the practice before and after the intervention. Furthermore, none of the demographic characteristics of the participants in both hospitals was observed to be significantly associated with pain management practice (Tables **6** and **7**).

Table 5. Attitude level of the participants 'Hospital B 'to pain management before and after intervention.

Variables	-	Before Intervention				After Intervention			
-	-	Poor	Good	X²	p	Poor	Good	X²	p
Age	21-30 years	0	6	1.412	.703	0	8	3.351	.278
	31-40 years	1	15	-	-	0	14	-	-
	41-50 years	0	8	-	-	1	7	-	-
	51-60 years	0	8	-	-	0	8	-	-
Gender	Male	0	7	.232	.630	0	7	.232	.816
	Female	1	30	-	-	1	30	-	-
Ethnicity	Yoruba	1	28	.319	.956	1	28	.319	.956
	Ibo	0	2	-	-	0	2	-	-
	Hausa	0	3	-	-	0	3	-	-
	Others	0	4	-	-	0	4	-	-
Marital Status	Married	1	29	.274	.872	1	30	.232	.891
	Divorce/separated	0	2	-	-	0	2	-	-
	Widowed	0	6	-	-	0	5	-	-
	Single	0	0	-	-	0	0	-	-
Religion	Christianity	1	19	.924	.336	1	20	.831	.553
	Islam	0	19	-	-	0	17	-	-
Nursing Specialty	Medical	0	10	2.521	.641	0	10	1.975	.741
	Surgical	0	7	-	-	0	6	-	-
	Oncology	0	2	-	-	0	1	-	-
	Emergency/ trauma	0	8	-	-	0	8	-	-
	Midwifery	1	10	-	-	1	12	-	-
Qualification	Diploma	0	11	.831	.660	1	10	2.521	.284
	Bachelor degree	1	20	-	-	0	20	-	-
	Post graduate	0	6	-	-	0	7	-	-
Work Experience (years)	1-5	0	4	.813	1.575	0	5	8.730	.068
	6-10	0	7	-	-	0	5	-	-
	11-15	1	14	-	-	0	15	-	-
	16-20	0	4	-	-	1	3	-	-
	Above 20	0	8	-	-	0	9	-	-
Attitude level (%)		**2.7**	**97.4**	**-**	**-**	**2.7**	**97.4**	**-**	**-**
		-	-	-	-	-	-	-	-

Note: X² and p represent Chi-square and probability values, respectively.

Table 6. Practice level of pain management of participants in 'Hospital A', before and after intervention.

Variables	-	Before Intervention				After Intervention			
-	-	Poor	Good	X²	p	Poor	Good	X²	p
Age	21-30 years	3	39	3.038	.386	1	40	1.037	.792
	31-40 years	0	23	-	-	0	21	-	-
	41-50 years	0	10	-	-	0	9	-	-
	51-60 years	0	8	-	-	0	12	-	-
Gender	Male	0	13	.578	.447	0	14	.205	.650
	Female	3	67	-	-	1	68	-	-
Ethnicity	Yoruba	3	68	.526	.913	1	72	.139	.987
	Ibo	0	4	-	-	0	3	-	-
	Hausa	0	5	-	-	0	4	-	-
	Others	0	3	-	-	0	3	-	-
Marital Status	Married	0	48	6.588	0.86	0	49	1.788	.618
	Divorce/separated	1	4	-	-	0	3	-	-
	Widowed	0	1	-	-	0	1	-	-
	Single	2	27	-	-	1	29	-	-

(Table 6) contd.....

Variables	-	Before Intervention				After Intervention			
-	-	Poor	Good	X²	p	Poor	Good	X²	p
Religion	Christianity	1	38	.233	.629	0	39	.897	.344
	Islam	2	42	-	-	1	43	-	-
Nursing Specialty	Medical	1	28	2.968	.563	1	29	1.788	.775
	Surgical	1	6	-	-	0	6	-	-
	Oncology	0	2	-	-	0	3	-	-
	Emergency/ trauma	1	28	-	-	0	28	-	-
	Midwifery	0	16	-	-	0	16	-	-
Qualification	Diploma	3	37	3.346	.188	1	39	1.088	.580
	Bachelor degree	0	36	-	-	0	36	-	-
	Post graduate	0	7	-	-	0	7	-	-
Working Experience (years)	1-5	3	33	4.064	.397	1	33	1.459	.834
	6-10	0	22	-	-	0	21	-	-
	11-15	0	15	-	-	0	16	-	-
	16-20	0	7	-	-	0	7	-	-
	Above 20	0	3	-	-	0	5	-	-
Pain management practice level (%)		3.6	96.4	-	-	1.2	98.8	-	-

Note: X^2 and p represent Chi-square and probability values, respectively.

3.4. Knowledge, Attitude, and Practice of Pain Management Scores of the Participants

Generally, the knowledge scores of the participants were observed to be significantly lower before the intervention compared to those after the intervention. This observation was irrespective of the two hospitals (p= 0.000). With respect to knowledge scores before the intervention, those of participants from 'Hospital A' were significantly higher than those from 'Hospital B'. In the case of scores after the intervention, although the average score of participants from 'Hospital B' was higher than that of those from 'Hospital A', the difference was insignificant (Table **8**).

As shown in Table **6**, the scores of attitudes toward pain management by the participants did not differ significantly before and after the intervention. This observation was irrespective of the hospital. In addition, the attitude scores before and after intervention did not vary significantly between the two hospitals (Table **8**).

A comparison of the pain practice scores of the participants revealed no significant difference between practice scores before and after the intervention. This observation was irrespective of the respondents in both hospitals. However, practice scores were significantly higher for respondents from 'Hospital B' than those from 'Hospital A' (Table **8**).

4. DISCUSSION

Participants' demographic characteristics showed that the majority were females; this is similar to a study conducted by Kidanemariam *et al*. [22], where the majority of the study participants were females. This may be due to the fact that nursing is a female-dominated profession. In terms of participants' educational attainment, the majority had diplomas or bachelor's degrees. This is also in line with the study of Wondimagegn *et al*. [1], where over 90% of participants had a degree.

The findings from the study revealed that the study participants had poor knowledge of pain management in the pretest for both hospitals. This is parallel to the pretest results of Eshete *et al*. [7], Abdul-Jaleel and Rajha [23] and Dijk [24], where a knowledge deficit of pain management was also reported among nurses [7, 23, 24]. Equally, another study from Rwanda reported poor knowledge before the intervention [25]. Moreover, a similar study conducted in Nigeria by Babatunde *et al*.[15] reported a knowledge deficit of nurses prior to intervention. Edmond *et al*. [26], in their study, also mentioned that pain control for hospitalized patients is considered a central concern for all healthcare providers, especially nurses, but lack of knowledge regarding assessment and relief measure skills were identified as a crucial barrier to effective pain management. Thus, pain management intervention is vital to improve nurses' knowledge, thereby resulting in positive pain management experienced by patients.

Post-test findings revealed a significant improvement in the participants' knowledge level of pain management at both hospitals after the intervention. This was indicated by the significant difference between the pre-and post-test results. The intervention program brought positive changes in knowledge level, and this has been supported by previous studies conducted by Nikuze [25], Tse *et al*. [27] and Khader [28], where there were highly significant differences between pre- and post-test knowledge. Correspondingly, a similar study conducted in Nigeria by Babatunde *et al*. [15] also reported that after applying a pain educational program, nurses' knowledge regarding pain management improved significantly. The low knowledge score in the pretest might be due to the lack of continuous training of the participants in appropriate pain management. This confirmed that pain educational programs can positively affect nurses' knowledge of pain assessment and pain management.

Table 7. Practice level of pain management of participants in 'Hospital B', before and after intervention.

Variables	-	Before Intervention				After Intervention			
-	-	Poor	Good	X^2	p	Poor	Good	X^2	p
Age	21-30 years	1	5	1.613	.653	-	8	-	-
	31-40 years	1	15	-	-	-	14	-	-
	41-50 years	1	7	-	-	-	8	-	-
	51-60 years	0	8	-	-	-	8	-	-
Gender	Male	-	-	-	-	-	-	-	-
	Female	0	7	.735	.391	-	7	-	-
	Total	3	28	-	-	-	31	-	-
	Ethnicity	3	26	1.011	.799	-	29	-	-
	Yoruba	0	2	-	-	-	2	-	-
	Ibo	0	3	-	-	-	3	-	-
	Hausa	0	4	-	-	-	4	-	-
	Others	2	28	.869	.648	-	31	-	-
Marital status	Married	-	-	-	-	-	-	-	-
	Divorce/separated	0	2	-	-	-	2	-	-
	Widowed	1	5	-	-	-	5	-	-
	Single	2	18	.257	.612	-	21	-	-
Religion	Christianity	1	17	-	-	-	17	-	-
	Islam	1	9	1.802	.772	-	10	-	-
Nursing specialty	Medical	1	6	-	-	-	6	-	-
	Surgical	0	2	-	-	-	1	-	-
	Oncology	1	7	-	-	-	8	-	-
	Emergency/ trauma	0	11	-	-	-	13	-	-
	Midwifery	1	10	.613	.736	-	11	-	-
Qualification	Diploma	2	19	-	-	-	20	-	-
	Bachelor degree	0	6	-	-	-	7	-	-
	Post graduate	1	3	4.536	.338	-	5	-	-
Working experience (years)	1-5	0	7	-	-	-	5	-	-
	6-10	1	14	-	-	-	15	-	-
	11-15	1	3	-	-	-	4	-	-
	16-20	1	8	-	-	-	9	-	-
	Above 20	0	3	6.855	.334	-	5	-	-
Pain management practice level (%)		**7.9**	**92.1**	**-**	**-**	**-**	**100.0**	**-**	**-**

Note: X^2 and p represent Chi-square and probability values, respectively.

Table 8. Comparison of knowledge, attitude and pain scores of participants.

-	Mean	Std. Dev.	95% CI of mean		Minimum	Maximum	Sig.
			Lower	Upper			
Knowledge of pain management							
Hospital A							-
Before	49.57	9.85	47.41	51.72	24.00	72.00	0.000
After	65.87	10.68	63.53	68.20	52.00	100.00	-
Total	57.72	13.11	55.71	59.73	24.00	100.00	-
Hospital B							
Before	43.58	7.88	40.99	46.17	24.00	56.00	0.000
After	66.84	11.42	63.09	70.60	44.00	88.00	-
Before intervention							
Hospital A	49.57	9.85	47.41	51.72	24.00	72.00	0.001
Hospital B	43.58	7.88	40.99	46.17	24.00	56.00	-
After intervention							
Hospital A	65.87	10.68	63.53	68.20	52.00	100.00	0.649

(Table 8) contd.....

-	Mean	Std. Dev.	95% CI of mean		Minimum	Maximum	Sig.
			Lower	Upper			
Hospital B	66.8	11.42	63.09	70.560	44.00	88.00	-
Attitude to pain management							
Hospital A							
Before	71.60	8.82	69.68	73.53	53.00	95.00	0.994
After	71.61	11.92	69.01	74.22	3.00	96.00	-
Hospital B							
Before	70.50	8.64	67.66	73.34	44.00	89.00	0.451
After	72.16	10.34	68.76	75.56	49.00	89.00	-
Before intervention							
Hospital A	71.60	8.82	69.68	73.53	53.00	95.00	0.522
Hospital B	70.50	8.64	67.66	73.34	44.00	89.00	-
After intervention							
Hospital A	71.61	11.92	69.01	74.22	3.00	96.00	0.809
Hospital B	72.16	10.34	68.76	75.56	49.00	89.00	-
Practice of pain management							
Hospital A							
Before	69.34	11.18	66.90	71.79	48.00	93.00	0.318
After	71.02	10.43	68.75	73.30	45.00	95.00	-
Hospital B							
Before	75.29	14.97	70.37	80.21	35.00	97.00	0.932
After	75.55	11.41	71.80	79.30	55.00	95.00	-
Before intervention							
Hospital A	69.34	11.18	66.90	71.79	48.00	93.00	0.016
Hospital B	75.29	14.97	70.37	80.21	35.00	97.00	-
After intervention							
Hospital A	71.02	10.43	68.75	73.30	45.00	95.00	**0.033**
Hospital B	75.55	11.41	71.80	79.30	55.00	95.00	-

The majority (98.35%) of the study participants had a good attitude toward pain management in both pre-and post-tests. This is consistent with the findings from similar studies [29, 20, 30]. Nurses are regarded as the cornerstones of patients' pain management in any clinical setting since they are with the patients at all times. Thus, their attitudes toward patients' pain management matter a lot. Notwithstanding, negative attitudes and misconceptions about pain and its management have been reported in different studies where nurses were reported to have stated that patients should be encouraged to endure as much pain as possible before pharmacological interventions such as opioids [31, 32]. The positive attitude of nurses in the study might be a link to their experience or study location.

With regard to nurse practice of pain management, good attitudes were observed among the participants in the two hospitals in both pre-and post-tests. The majority (76.3%) of the participants reported that they assessed the patient's pain level in their daily practice before administering any form of pain management. This is similar to a study done in Rwanda by Nikuze [25], which also showed that the majority (76.4%) of nurses in their study usually assess pain levels. Conversely, Kassa *et al*. [33] observed in a similar study conducted in Ethiopia that 61% of nurses were not using pain assessment tools to evaluate the intensity and severity of their patients' pain before implementing pain reduction strategies for patients. There was no significant association observed in this study between age, educational level, years of experience, nursing

knowledge, and practice, particularly in the area of pain management, but this is in contrast with the finding of Dessie *et al*. [34], where nursing education, professional activity, and years of clinical experience are all related to the knowledge needed for pain management competency. Nurses' poor pain management practices can be attributed to their preconceived notions regarding pain endurance, emotion, and not believing the patient [31]. This leads to bias and prejudice on the part of the nurses. Biases and prejudices influence their approach to collaboratively managing pain with patients.

CONCLUSION

Poor knowledge of pain management has been recognized as one of the most significant roadblocks to successful pain management worldwide. As shown in the study, improper pain management is attributable to poor knowledge about pain as well as the various ways by which it can be managed. In addition, the post-test findings revealed a positive change in knowledge level which can result in effective and efficient pain management. Thus, to improve pain management in healthcare settings, interventions must focus on improving the knowledge level, attitudes, and practices of nurses. This could also include overcoming existing institutional barriers through appropriate staff training and hospital strategy development. Nurses have a moral and professional obligation to care for patients in pain. Therefore, all healthcare institutions should observe regular training and seminars on pain assessment and management to

improve the services rendered and ensure optimal pain management outcomes. Based on the findings, it is implored that pre-service and in-service training should be allowed at intervals to equip the participants with up-to-date innovations in pain management, thereby improving nurse understanding of pain management and ensuring effective practices. If this training is done at intervals, novice nurses starting their professional careers can begin with the right orientation and information regarding pain management.

Despite the fact that the study's goals are being met, there are still some limitations. The scope of this study was limited to nurses in two selected hospitals in Ilorin, Kwara State. Thus, the findings cannot be generalized to a larger context. Also, a subjective self-reported assessment tool was used. Notwithstanding, the training program provided by the researchers was adjudged to positively affect the nurses' knowledge, attitude and practice of pain management.

LIST OF ABBREVIATIONS

NKAS = Nurse Knowledge, Attitude, Survey, and Practice

SPSS = Statistical Package for Social Science

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

This study was approved by the Research and Ethics Committee, Ministry of Health, Kwara State, Nigeria, with approval number ERC/MOH/2021/12/012.

HUMAN AND ANIMAL RIGHTS

No animals were used for the studies that are the basis of this research. All human procedures followed were in accordance with the guidelines of Helsinki Declaration of 1975.

CONSENT FOR PUBLICATION

Informed consent was obtained from all participants of this study.

AVAILABILITY OF DATA AND MATERIALS

The authors confirm that the data supporting the findings of this research are available within the article.

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CONFLICT OF INTEREST

The authors declare no conflicts of interest, financial or otherwise.

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