

Full Length Research Paper

Pain as 5th vital sign: impact of pain assessment training program on Nigerian nurses' knowledge of pain management

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Pain is subjective and it can only be described by the individual experiencing it. It is the main reason why people seek medical help. Nurses play a major role in the management of pain; hence they must be highly knowledgeable to ensure their practices are of high quality. The aim of this study was to evaluate the impact of Nurses' Pain Educational Program (NPEP) on nurses' knowledge of pain management. The quantitative design was employed in the study; five lectures on the Nurses Pain Educational Program (NPEP) were conducted for 500 nurses. All participants were given 15 items questionnaires in a pre and post test design. The study location was the University College Hospital Ibadan and the duration of the study was between March to December, 2015. The pre and post-test on nurses' knowledge were analyzed using descriptive and inferential statistics and the overall improvement in knowledge and management of pain was analyzed using the student t-test. The participants were divided into groups; each group was trained for two days in a week using the Nurses Pain Educational Program Package (NPEP). Findings revealed an improvement in knowledge which was found to be statistically significant ($P < 0.000$). This was evident by the results of the pre-test and post-test values; pre-test mean score was 2.6 ± 0.05 while that of the post test score was 4.0 ± 0.04 . This indicated that knowledge was impacted. The Nurses Pain Educational Program had a positive effect on nurses' knowledge of pain assessment and pain management.

Key words: Nurses' Pain Education Program (NPEP), nursing, pain management.

INTRODUCTION

Pain is a universal experience, and it is the most frequent reason why people seek health care. It is described as

the way the brain interprets information about a particular sensation that the body is experiencing (Ojong et al.,

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2014).

Mansour et al. (2016), stated that quality of life and performance of patients is worsened if pain is under diagnosed by health care providers. There is a growing recognition that pain is a complex experience, yet it is among the most neglected and under-treated amidst patient's complaints (Ali and Thompson, 2009). According to Zhang et al. (2008), inadequate treatment of pain is a pervasive clinical problem in hospitalized patients, resulting in significant physiological, psychological, and financial consequences which include poor recovery, a higher rate of complications, anxiety, sleep disturbance, and lowered quality of life.

In a study conducted by Nahin (2015), it was estimated that within a previous three-month period, 25 million U.S. adults had daily chronic pain, and 23 million more reported severe pain. Those with serious pain need and use more health care services and suffer a greater disability than persons with less severe pain (America Society of Pain, 2015).

The International Association of the Study of Pain (IASP) (2011) defines pain as an unpleasant, sensory, emotional and subjective experience associated with tissue damage. Also, Puntillo et al. (2008), stated in their article, that pain is what the patient experiencing it says it is. Patients can experience pain from preexisting diseases, invasive procedures and trauma. If ineffectively managed, acute pain can lead to negative physiological and psychological ramifications, including the development of chronic pain syndromes (Kehlet et al., 2006; Bower and Reuter, 2009). Despite substantial advances in pain research and management, people continue to suffer because of inadequate pain assessment and pain control, thereby leaving gaps in the quality and safety of pain management provided to patients (International Association for the Study of Pain, 2011). Pain that is not well controlled can lead to discomfort and suffering which can include unwanted consequences such as delayed healing, an increased risk of morbidity, a prolonged hospital stay, and the risk of developing chronic persistent pain (Wells et al., 2008; Morton and Fontaine, 2013).

Nurses play a pivotal role in the assessment, relief, and evaluation of pain. Maintaining an optimal level of comfort for patients is a universal goal for physicians and nurses because pain is one of the major experiences that can minimize patient comfort (Kizza et al., 2016). The consequences of unrelieved pain can be devastating as opined in a survey by the National Health Service (NHS) trusts in England (2007) that reported 67% of patients experienced pain whilst in hospital; despite relief efforts, this experience can be reduced if nurses have adequate knowledge of pain assessment and management.

In achieving the goal of pain management, nurses have numerous responsibilities and should have adequate knowledge required (Craigie, 2014; Coulling, 2005;

Courtenay and Carey, 2008). Zhang et al. (2008) stated that many nurses lack pain management knowledge and a varying number of studies indicated knowledge deficits and inadequate pain assessment as the most important barriers for health care professionals in implementing pain management. Bakshi et al. (2014), posit that pain education for health professionals at all levels has been repeatedly identified as an important step to changing ineffective pain management practices.

According to Khomerian et al. (2006), nurses' theoretical knowledge influences their ability to meet practice expectation in order to improve quality care. Nursing education has evolved to meet the changing demand in health care, of which continuing educational program is one such effective method of educating nurses in pain management, since there is a major poor performance in pain assessment and management (Latchman, 2014).

In Nigeria, no study has been done to evaluate the nurses' knowledge of pain assessment and management, compared to other developing countries such as Uganda and Zimbabwe, where nurses' knowledge and practice related to pain assessment and management were studied. In Zimbabwe registered nurses had low knowledge levels and poor attitude regarding pain management of adult medical patients (Manwere et al., 2015). Also, in a study conducted in Uganda by Kizza et al. (2016), nurses generally had adequate knowledge about pain assessment principle, but there was a lack of knowledge about some key concepts such as value for patients' autonomy in pain assessment and pre-emptive analgesia concepts. This knowledge gap may affect their ability to provide quality pain assessment and management.

However, it was observed in University College Hospital Ibadan that most patients who were present in the hospital have mild, moderate to severe pain which is not measured to know the quality and intensity. Pain is managed in this institution using multidisciplinary approach which had little effect on patients' recovery. This is due to inadequate knowledge on pain management and assessment of the health care provider. It was also observed that nurses have a poor attitude towards pain assessment and management, for example by fostering patient addiction to opiates. In pain control nurses play an essential role, however, in order to meet with practice expectation nurses need to have adequate effective training in pain assessment/management which brought about the need for NPEP.

Therefore, evaluating the impact of Nurses' Pain Educational Program (NPEP) on nurses' knowledge of pain management is a paramount step in constructing a foundation for better strategies in effective management of pain, ensuring patients' comfort and ultimate improvement of nursing practice in giving quality care to

patients. Findings from this study will add important information to the literature regarding nurses' knowledge on pain management/assessment in Nigeria and also assist in designing continuing professional development programs for nurses in clinical settings to further scale up their pain assessment skills of clients towards ensuring total quality /holistic care. The objectives of the study includes: 1, general objective which is to evaluate the impact of Nurses' Pain Educational Program (NPEP) on nurses' knowledge of pain management and 2 the specific objective which includes to assess the knowledge of clinical nurses on pain management and to evaluate the impact of the training on clinical Nurses' knowledge.

METHODS

A pre and post-test intervention study was used to evaluate the impact of Nurses' Pain Educational Program (NPEP) on nurses' knowledge of pain management in the University College Hospital Ibadan. Samples of 500 nurses were selected using systematic random sampling. Data was collected using a self administered structured questionnaire which was developed after an extensive literature review. The questionnaire consists of two sections; section A assessed the demographic data of nurses and section B assessed the knowledge of nurses on pain assessment and management. The content validity of the research instrument was examined by expert in pain management in the University College Hospital Ibadan. Approval for the study was obtained from the management board of University College Hospital. The questionnaires were anonymous and the nurses consented to participate in the study. Data analysis was performed using statistical package for social sciences version (SPSS) 22.0.

Descriptive and inferential statistics were employed in analyzing the significance level of $p < 0.05$ data.

Sampling technique

A systemic random sampling method was used to select 500 nurses that participated in the training out of 1195 nurses in the setting. The nurses were divided into 28 groups and each group contained 17-18 nurses. The selected nurses participated in pain assessment training for a period of 28 weeks. The group's nucleus members included all cadres of nurses. This same set of nurses had two days training in a week lasting 4-5 h daily: Day 1 all participants were given a set of questions with a participant specific code and were allotted 30 min to answer 15 questions prior to the beginning of the training to access their basic knowledge on pain management. This was followed by training and a practicum section using hypothetical cases. This same set of questions was answered at the end of the training to ascertain if knowledge was impacted; Day 2 included training and practicum demonstration on patients on the use of pain assessment tools. Consent was taken and patient who volunteered was used for the demonstration and the nurses pain assessment skills were assessed. After which they were requested to answer the same set of questions as a post test at the end of teaching activities. The practicum demonstrated assessment of the patient's level pain by using various pain rating scales. The training also instructed the group members in the correct way to document the pain ratings, pain quality, pain location and impact of pain on a Pain Assessment Record Booklet (PARB). The participant code was used to identify each participant's pre and post tests.

The educational package for the training

The Nurses' Pain Educational Program (NPEP) aimed to promote nurses' knowledge regarding pain measurement and management and build nurses' skills to perform better pain management behaviors (such as use a pain assessment tool in clinical practice). The NPEP consist of two components: an education program and clinical demonstration to implement pain assessment and management. To ensure administrative support of NPEP, a pain assessment group was led by the principal investigator and the nursing staff of the Continuing Education/ Research Unit. The NPEP intervention included, focused education, group activity, and individual instruction. Teaching materials included handbook, standardized pain assessment materials and a pocket numeric pain rating / Wong baker pain scale tool. The standardized procedure for assessing pain using the numeric pain rating / Wong baker pain scale tool were provided to nurses in every unit.

The Nurses' Pain Educational Program Package included five lectures on: introduction to pain; concept of pain and pain assessment; common myths about pain; pain assessment tools; newly Modified Vital signs Chart to include pain as the 5th vital signs.

Instruments for data collection

The instrument for data collection is a self-administered questionnaire for the pre and post assessment. The questionnaire items were structured to collect information about: Section A, the socio-demographic characteristics of nurses which addresses participant age, sex, years of experience level of education and nurses' professional cadres; Section B: addressed questions on nurses' knowledge of pain assessment tools and pain management.

RESULTS

As shown in Table 1, the sex distribution of the participants' shows that majority 467(96.9%) were females. The participant mean age was 40 ± 7.1 years, majority of the participants had above 10yrs of experience 179 (37.1). The professional qualification of the nurses shows that 82.0% were registered nurses/ midwife (RN/RM), 17.4% had a degree in nursing while 0.6% had Master degree in nursing. Professional cadres of nurses revealed that 34.6% of the nurses were Nursing Officer I&II (NOI& NOII), 7.9% were Senior Nursing Officer (SNO), 36.5% were Assistant Chief Nursing Officer (ACNO), 20.3% were Chief Nursing Officer (CNO) and 0.6% were Assistant Director of Nursing(ADN).

As reflected in Table 2, the mean score of the pre and post-test of the participant revealed significant difference with t value = -22.039 and $p = 0.000$.

In Table 3, the mean score of the pre and post-test of the participant demonstration skills revealed significant difference with t value = -7.249 and $p = 0.000$.

DISCUSSION

A total of 482 questionnaires was retrieved which gives

Table 1. Socio-demographic characteristics of nurses.

Variables	Level	Frequency	Percentage
Sex	Male	15	3.1
	Female	467	96.9
Total		482	100.0
Age in years(M=40.1,SD=7.1)	25-30	17	3.5
	31-35	125	25.9
	36-40	126	26.1
	41-45	101	21.0
	46-50	69	14.3
	51-55	34	7.1
	56-60	10	2.1
Total		482	100.0
Year of experience	1-5 years	136	28.2
	6-10 years	167	34.6
	Above 10 years	179	37.1
Total		482	100.0
Level of Education	RN/RM	395	82.0
	BNSc	84	17.4
	MSc	3	0.6
Total		482	100.0
Professional Cadre	NO I/NO II	167	34.6
	SNO	38	7.9
	ACNO	176	36.5
	CNO	98	20.3
	AND	3	0.6
Total		482	100.0

Table 2. Pretest and Posttest mean scores of nurses' level of knowledge on pain management.

Parameter	Mean \pm SE	SD	T	P-value
Pre-test	2.6307 \pm 0.04551	0.99924	-22.039	0.000***
Post-test	4.0228 \pm 0.04380	0.96158		

96.4% participation rate, the majority of the nurses were within the age bracket of 36 to 40 years which gives 26.1%; this could be due to the fact that this age range lies within the productive age in the workforce in the hospital. Female nurses constitute 96.9% of the target sampled. The high percentage of female nurses in this study revealed nursing as a female dominated profession in Nigeria. The majority of the nurses had above ten years of professional experience (37.1%) and had attained diploma level (82.0%) of education in nursing.

Also, majority of the nurses that participated in the study happens to be an Assistant Chief Nursing Officer (ACNO) (36.5%), who are wards managers in various wards thereby enabling them to become trainers.

The results of the pre-test showed a deficiency in the baseline pain knowledge amongst the participants (2.6 \pm 0.05) while that of the post test score was 4.0 \pm 0.04; this show an improvement in knowledge which was found to be statistically significant ($p < 0.000$). A similar finding was found by Ellis et al. (2007) in a study, to examine the

Table 3. Pretest and Posttest mean scores of the nurses' skill demonstration on pain management.

Parameter	Mean \pm SE	SD	T	P-value
Pretest	1.4667 \pm 0.18404	1.00801	-7.249	0.000***
Posttest	3.1 \pm 0.12999	0.71197	-	-

implementation of a comprehensive program to improve the practices of pain management in a pediatric hospital. They reported a statistically significant improvement in their pain assessment and management practice after the implementation of the program with the $p=0.004$, 0.17 respectively as opposed to a study by Kaur (2017), on knowledge and attitude regarding pain management among staff nurses at Kular Hospital, Bija (Punjab), where nurse were reported to have average knowledge and attitudes towards pain management.

Furthermore, in a related study by Odutayo et al. (2013), on impact of an educational program on the use of standardized nursing languages for nursing documentation among public health nurses in Nigeria, a significant difference with the t value = -27.61 , $d.f.$ 99, $p = 0.0001$ in the mean score of pretest and posttest of their experimental group was reported which also revealed that knowledge was impacted. However, Ho et al. (2013), in their study reported that respondents possessed good knowledge (99.12 ± 14.810) and attitude (66.00 ± 10.415) towards pain management after an educational program.

This shows that, health practitioners, including nurses, would embrace and implement new ideas and practices, such as the use of pain assessment tools, if they are informed, educated, and have a congruent understanding of the relevant concepts. This is in line with the American Nurses Association (2006) which states that nurses would acquire adequate knowledge when trained consistently through seminars/workshops, in-service training, and higher education.

Regarding the evaluation on the impact of the training on clinical Nurses' knowledge, result revealed that nurses had good demonstration of the use of pain rating tools with a mean score 3.1 ± 0.1 post test. The result also showed a significant difference in the pretest and posttest with $t = -7.249$, $p = 0.000$. This result is similar to a study in Uganda by Kizza (2012), that almost all the nurses knew the pain assessment tool (90%), assessment and documentation of pain are very important (93%) and averagely, the nurses scored 71.8% with a median score of 71.43% on theoretical knowledge. This as well also indicates that nurses have reasonable knowledge about pain assessment tools. The findings from this study support the opinion of Williams (2007), that when nurses have a good knowledge of pain their patients receive a higher standard of pain assessment and management. This is because knowledge is an important factor that brings about change.

On the contrary, in a study by Rampanjoto et al. (2007), more than three quarters of nurses could not assess pain using the provided Visual Analogue Scale. This may imply that provision of tools and presence of a protocol on how to use them are not enough to ensure the use of the tools. There is increasing evidence on the effect of continuing education programs on pain assessment practices (Bedard et al., 2006; Abdalrahim, 2009). For example, in Jordan a well planned and implemented education program conducted for nurses coupled with supervision of the application of knowledge shows that nurses developed a habit of assessing post-operative pain intensity using numerical rating scales and improved documentation practices (Abdalrahim, 2009).

Limitation

Undoubtedly, the study was confronted with some limitations that need to be addressed in further studies that have a similar focus. One of the major limitations of the study was the use of a questionnaire as a self-report assessment tool designed to tap information on variables in the study. We report this as a limitation because respondents can fake their responses in order to present themselves in a desired manner, which could affect the general opinion of the subject matter in the population sampled. The study was also limited to the clinical nurses only.

CONCLUSION AND RECOMMENDATION

The questionnaire study found that the current knowledge about pain assessment and management is deficient and with the introduction of the nurses' pain educational program, there was a positive effect on nurses' knowledge, practice, and demonstration related to pain assessment and pain management.

Based on the findings from this study, there is need to design and implement a continuous professional education program on pain and its assessment with special focus on the methods of assessment, guidelines, protocols and documentation of pain in patients. In addition, we recommend that the management of the hospitals should continually supply tools, charts and protocols for pain management and assessment. Implementation of these recommendations will require a

multifaceted approach which will combine input from the hospital management, nurse leaders in conjunction with clinical nurse-educators of the continuing education unit.

To ensure the proper and continued use of tools, protocols and charts, there is a need for a supportive environment which can be attained through improving staffing, provision of monitoring and support supervision by experienced and skilled nurses.

A study employing mixed methods involving more than one hospital is recommended to gain more insight on the knowledge and practices of nurses related to pain assessment so that the study could be more generalized. The study was also limited to the clinical nurses only. It was also observed that, some of the nurses did not return the questionnaires which led to the reduction in sample size. There is a need for more research in Nigeria on how pain assessment tools can be adapted to client care and the impact of pain management on client care.

CONFLICT OF INTERESTS

The authors declare that they have no financial or personal relationships that may have inappropriately influenced them in writing this article.

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REFERENCES

- Abdalahim MS (2009). Postoperative pain assessment and management; the effects of educational program of Jordanian nurses' practices, knowledge and attitudes. Available at: <https://gupea.ub.gu.se/handle/2077/20316>
- Ali N, Thompson DA (2009). Comparison of the knowledge of chronic pain and its management between final year physiotherapy and medical student. *Eur. J. Pain* 13:38-50.
- American Society of Pain (2015). NIH study shows the prevalence of chronic or severe pain in US adults. Available at: <http://americanpainsociety.org/about-us/press-room/nih-study-shows-prevalence-of-chronic-or-severe-pain-in-u-s-adults>
- American Nurses Association (2006). ANA recognized terminologies and data element sets. Available at: <https://www.scribd.com/document/54800799/ANA-Recognized-Terminologies-and-Data-Element-Sets>
- Bakshi SE, Jain PN, Kannan S (2014). An assessment of basic pain knowledge and impact of pain education on Indian anesthesiologists-a pre and post questionnaire study. *Indian J. Anesth.* 58(2):127-131.
- Bedard D, Purden M, Certosini C (2006). The pain experience of post-surgical patients following implementation of evidence based approach pain management. *Nursing* 7(3):80-92.
- Bower TC, Reuter JP (2009). Analgesia sedation and neuromuscular blockade in the trauma patient. Quillam, KA, Makic MBF, Whalen E, eds. *Trauma nursing from resuscitation through rehabilitation*. 4th edition. Philadelphia: Saunders, Elsevier, pp. 372-421. Available at: <https://musculoskeletalkey.com/analgesia-sedation-and-neuromuscular-blockade-in-the-trauma-patient/>
- Coulling S (2005). Nurses' and doctors' knowledge of pain after surgery. *Nurs. Standard* 19(34):41-49.
- Courtenay M, Carey N (2008). The impact and effectiveness of nurse-led care in the management of acute and chronic pain: a review of the literature. *J. Clin. Nurs.* 17(15):2001-2013.
- Craig JA (2014). *Nursing Knowledge and Attitudes toward Pain Management*. Gardner-Webb University. Available at: http://digitalcommons.gardner-webb.edu/nursing_etd/8/
- Ellis JA, McCleary L, Blouin R, Dube K, Rowley B, MacNeil M, Cooke C (2007). Implementing best practice pain management in a pediatric hospital. *J. Spec. Pediatr. Nurs.* 12(4):264-277.
- Ho SE, Ho CC, Pang Yuen H, Lexshimi R, Choy YC, Jaafar MZ, Cardosa M, Das S (2013). A study of knowledge and attitudes of registered nurses towards pain management in an urban hospital. *Clin. Ter.* 164(3):215-219.
- International Association for the Study of Pain (IASP) (2011). Pain terminology: A list with definitions and notes on usage. Changes in 2011. *Pain*, pp. 209-214. <https://www.iasp-pain.org/Education/Content.aspx?ItemNumber=1698>
- Kehlet H, Jensen TS, Woolf CJ (2006). Persistent postsurgical pain: risk factors and prevention. *Lancet* 367(9522):1618-1625.
- Khomeiran RT, Yekta ZP, Kiger AM, Ahmadi F (2006). Professional competence: factors described by nurses as influencing their development. *Int. Nurs. Rev.* 53(1):66-72.
- Kizza IB (2012). Nurses' knowledge of the principles of acute pain assessment in critically ill adult patients who are able to self report. 20-27. MSN (Critical Care and Trauma) Dissertation Muhimbili University of Health and Allied Sciences November 2012.
- Kizza IB, Muliira JB, Kohi TW, Nabirye RS (2016). Nurses' knowledge of the principles of acute pain assessment in critically ill adult patients who are able to self report. *Int. J. Africa Nurs. Sci.* 4:20-27.
- Kaur K (2017). Knowledge and Attitude Regarding Pain Management among Staff Nurses. *Nurs. Care Open Access J.* 2(1):00024.
- Latchman J (2014). Improving pain management at the nursing education level: Evaluating knowledge and attitude. *J. Adv. Pract. Oncol.* 5(1):10-16.
- Manwere A, Chipfuwa T, Mukwamba M.M, Chironda G (2015). Knowledge and Attitude of Registered Nurses towards pain management of adult medical patients: A case of Bindura Hospital. *Health Sci. J.* 9(4):3.
- Mansour A, Fatemeh S, Sakineh S, Yones J, Maryam R, Mohammad E, Nezar G, Abbas B (2016). Effects of training programs on knowledge and attitudes of nurses about postoperative pain. *Der Pharm. litte* 8(4):108-111.
- Morton P, Fontaine D (2013). *Essentials of critical care nursing: a holistic approach*. Lippincott Williams Wilkins ISBN/ISSN 978160913693 Published on October 15, 2013. <https://www.amazon.com/Essentials-Critical-Care-Nursing-Holistic/dp/1609136934>
- Nahin RL (2015). Estimates of pain prevalence and severity in adults: United States, 2012. *J. Pain* 16(8):769-780. Available online at: <http://www.sciencedirect.com/science/article/pii/S1526590015006793>
- National Health Service (NHS) (2007). Adult Inpatient Survey Results. Available at: <http://www.nhssurveys.org/survey/613>
- Odotayo PO, Olaogun AA, Oluwatosin AO, Ogunfowokan AA (2013). Impact of an Educational Program on the Use of Standardized Nursing Languages for Nursing Documentation Among Public Health Nurses in Nigeria. *Int. J. Nurs. knowl.* 24(2):108-112.
- Ojong IN, Ojong-Alasia MM, Nlumanze FF (2014). Nurses' assessment and management of pain among surgical patients in secondary health facility in Calabar metropolis, Cross River State, Nigeria *European. J. Exp. Biol.* 4(1):315-320.
- Puntillo K, Li D, Miaskowski C (2008). A review of objective pain measures for use with critical care patients unable to self-report. *J. Pain* 9(1):2-10.
- Rampanjoto RM, Mukarugiwa F, Ndimubanzi CP, Finucane BF (2007). Factors influencing pain management by nurses in emergency departments in central Africa. *J. Emerg. Med.* 24(47):475-476.
- Wells N, Pasero C, Mc Caffery M (2008). Improving the quality of care

- through pain assessment and management. An evidence based Handbook for Nurses. Rockville; Agency for healthcare research and quality. Available at: <https://www.ncbi.nlm.nih.gov/books/NBK2658/?report=reader>
- Williams B (2007). Nurses' knowledge of pain. *J. Clin. Nurs.* 16(6):1012-1020.
- Zhang CH, Hsu L, Zou BR, Li JF, Wang HY, Huang, J. (2008). Effect of a pain education program on Nurses' pain knowledge, attitudes and assessment practice in china. *J. Pain Symptom Manag.* 36(6):616-627.