Original Research Article

ASSESSING NURSES KNOWLEDGE AND ATTITUDES ON PAIN MANAGEMENT IN CHILDREN AT THE TAMALE WEST HOSPITAL

Comment [WU1]: There are a lot of spelling and grammar mistakes. Highlights became a number of them in the text

ABSTRACT

Background: Pain continues to be the most devastating symptom experienced by hospitalized patients and the major reason for seeking medical and surgical intervention (Shoqirat & Mahasneh, 2019). Despite the existence of guidelines on pain assessment and management, children continue to experience unrelieved pain during hospitalization.

Comment [WU2]: References need to be removed

Purpose: The study aimed at assessing Nurses Knowledge on Paediatric Pain Assessment and Management at the Tamale West Hospital.

Methodology: A descriptive cross-sectional survey was conducted among 120 registered nurses at the Tamale West Hospital in Ghana. The consecutive sampling technique was employed to recruit participants. Over a two-month period from April to May 2020 research data were collected using the Pediatric Nurses' Knowledge and Attitudes Survey regarding pain (PNKAS). Data were analyzed and presented using descriptive and inferential statistics.

Comment [WU3]: It is better to mention the main inclucion and exclucion riteria of the participants

Key findings: The study revealed that nurses at the Tamale West Hospital in Ghana generally have insufficient knowledge toward pain in children. There is the urgent need to intensify education in this area so as to adequately prepare these nurses to cater for the pain needs of vulnerable children and their families.

Comment [WU4]: It is necessary to present the results based on the findings of the study. Avoid discussing in this section

Recommendations: Future studies should focus on how student's theoretical knowledge and attitudes are linked to their pediatric pain assessment and management practices.

Key Words: *Nurses Knowledge, Pain Assessment and Management, Paediatric Ward, Paediatric Nurses, Tamale West Hospital.*

Comment [WU5]: Use mesh words

BACKGROUND

Pain continues to be the most devastating symptom experienced by hospitalized patients and the major reason for seeking medical and surgical intervention (Shoqirat & Mahasneh, 2019). Despite the existence of guidelines on pain assessment and management, children continue to experience unrelieved pain during hospitalization (Alotaibi, Higgins, & Chan, 2019; Ramira, Instone, & Clark, 2016). Inadequate pain management in children is a global health concern due to difficulties encountered in assessing and managing pain in this vulnerable group (Lunsford, 2015). Infants and young children may not be able to describe their pain, its nature, location and severity depending on their age and cognitive development (Alotaibi et al., 2018). Hence, nurses who form the majority of healthcare providers may be required to use appropriate strategies to assess and manage children's pain based on their level of cognitive development and pain typology (Beltramini, Milojevic & Pateron, 2017).

Efficient paediatric pain assessment and management, relies on sufficient knowledge of health care providers particularly nurses, who spend the most time with hospitalized children and their families. The consequences of unrelieved and mismanaged paediatric pain are not limited to sensations of discomfort and unpleasantness but incorporates further insidious body system malfunctioning (Gerrits et., 2014; Dueñas et al., 2016). These include hyperglycemia, increased inflammatory responses, gastrointestinal obstruction, immunosuppression, chronic pain among others (Tennant. 2013; Hasuo et al., 2017). Furthermore, it poses financial burden for affected

families and healthcare systems due to delayed recovery time and its associated increased cost of healthcare (Tumin et al., 2018). Unrelieved pain has been noted to significantly affect children's school attendance, performance, and their ability to play and socialize (Agoston, Gray & Logan, 2016).

Considering the effects of unrelieved pain on children's health, it is not surprising that effective pain management has been recognized as a fundamental human right of every child (Olmstead, 2010). Efficient pain management, however, partly relies on sufficient knowledge and appropriate attitudes of health care providers particularly nurses, who spend the most time with hospitalized children and their families. As members of the healthcare team, nurses play a vital role in the management and control of pain through accurate assessment, planning, implementation and evaluation of pain relief measures (Al-Khawaldeh, Al-Hussami & Darawad, 2013). In order for nurses to perform their pain assessment and management roles efficiently and effectively, they need to be adequately knowledgeable. Nurses ought to have a solid knowledge base of pediatric pain and its management as this impact on their practice (Al-Khawaldeh, Al-Hussami & Darawad, 2013). Data regarding nurses' knowledge on paediatric pain assessment and management is sparse particularly in the sub-Saharan Africa sub-region including Ghana. The aim of this study is to assess nurses' knowledge of paediatric pain assessment and management at the Tamale West Hospital.

METHODS

Study Design: Research design is a map or plan of how the researcher intends to carry out the research (De Vos et al., 2011). A research design focuses on the end product, formulates a research problem as a point of departure, and focuses on the logic pertaining to the research (De Vos et al, 2011). Research designs are made of quantitative, qualitative or mixed methods approach which gives specific directions for research procedures (Creswell, 2014, p.12). Quantitative research involves the use of computational, statistical, and mathematical tools to

derive results (Neuman, 2013). It is conclusive in its purpose as it tries to quantify the problem and understand how prevalent it is by looking for projectable results to a larger population (Neuman, 2013). The present study employed descriptive cross-sectional quantitative approach. This design was appropriate as the study will be predictive in nature and will examine associations (Shaughnessy, Zechmeister, & Zechmeister, 2012).

Study Population: All nurses working in the Tamale West Hospital constituted the target population for this study. Specialization in children's nursing is not required of nurses to practice within pediatric care settings in Ghana. Many clinical nurses encountered in children's care unit are general nurses as the pediatric nursing specialty is still new and evolving in Ghana. Nurses who work in other units of the hospital are also confronted with children who have varied levels of pain caused by clinical conditions, injuries, hospital procedures or some unknown factors. Additionally, nurses in the study hospital are reshuffled annually. This implies that every nurse is likely to work in the paediatric unit if they have never worked there.

Setting: The study was conducted at the Tamale West Hospital (TWH). The TWH is located in the Tamale metropolis, the administrative capital of the northern region of Ghana. The Tamale Metropolis has a total population of 371, 351 (Ghana Statistical Service, 2014). The hospital has a bed capacity of 120 and serves as a referral facility for some districts in the northern region. As at December 2019, the facility had a total number of 350 nurses. The TWH renders outpatient and inpatient services, medical and surgical treatments, obstetric/gynaecological services, public

health services, among others. The hospital was established in 1951 by the British colonial government.

Inclusion Criteria: Participants were included in the study if they were:

Registered Nurses who were currently working at all the wards and providing care for children at Tamale West Hospital.

Nurses who had been working at the Hospital for the past one year and currently rotated to work at other wards.

Nurses who had completed a three years diploma in nursing and/or degree.

Exclusion Criteria: The exclusion criteria include;

Nurse with less than one year working experience and those who refuse to participate were excluded from the study

Nurse assistants or enrolled nurses were excluded

Nurses who were undertaking their one-year rotation were also excluded

Sampling: The non-probability consecutive sampling technique was employed to recruit respondents into the study. This technique is chosen to enable the researcher enroll every participant until the required sample size is met.

Sample Size Determination: Sample size is defined as a count of the individual samples or observations in any statistical such as scientific or public opinion survey (Polit & Beck, 2004). The total sample framework for the number of nurses working in the Tamale west hospital is 350. The sample size for the survey was computed according to the formula for sample size determination by Yamane (1967).

$$n = \frac{N}{1+Ne^2}$$

Where ***n*** is required sample size.

N is the total population size which is 170 nurses.

e is acceptable sampling error (0.05) at 95% Confidence Interval

By substitution:

$$n = \frac{170}{1+170(0.05)^2} \quad n = 120$$

Hence, the sample size for the study = **120** respondents.

Using an actual population of 170 nurses, a sample size of 120 respondents will be required for this study. Considering a 10% non-response rate, an estimated sample size of 132 will be considered sufficient in powering the present study. Therefore, a total of 132 nurses will be invited into the study.

Data collection instrument: A structured questionnaire consisting of two sections was used for data collection. The first section comprised of information on participants socio-demographic. The second section assessed nurses' knowledge and attitude regarding children's pain using the Paediatric Knowledge and Attitudes Survey (PNKAS).

Data collection procedure: After obtaining the requisite approvals from the institution and the ethics committee, the researchers approached nurses at their recess time between duties at the hospital under study to brief them about the study. The aims and nature of the study was explained to the participants before obtaining their informed consent. Those who consented to participate were given hard copies of the questionnaire which took about 20–30 minutes to complete over a one-month period in the year 2020.

Data Management: All data was then entered into encrypted Microsoft Excel spreadsheets. To ensure confidentiality, only unique identifiers were included with the survey data in the electronic database. Encryption and passwords were used on the researchers' laptop. Files was deleted from the researchers' computer after study completion and was transferred to an external electronic drive, with the participant log and the survey data stored separately. The paper questionnaires were stored by the researchers' supervisor in a locked filing cabinet in a locked office in the Department of Nursing at UDS. All documents will be shredded and all electronic data deleted after seven years.

Data Processing and Analysis: The IBM Statistics Package for Social Sciences (SPSS) Version 25 was used to analyze data. Participants' data was initially entered and cleaned in Microsoft excel before being exported into Statistical Package for Social Sciences version 25 for further analysis. Descriptive statistics, such as frequencies, percentages, means, and standard deviations used to describe and summarize the data. The Pearson Chi square test was used to determine the association between variables. A $p < 0.05$ was considered to be statistically significant. A correctly answered question on the PNKAS instrument was awarded one point, whereas an incorrectly answered item will be given a zero score. The total score of this 42-item instrument will be converted into percentages for standardization purposes. A nurse who obtains 80% of the total score will be considered as having satisfactory knowledge regarding children's pain.

Comment [WU6]: It needs to be presented in the methodology section

Ethical Consideration: Permission to gain access to potential nurses was secured from the management of the Tamale West Hospital. Ethical approval was sought from the Ethics Review Committee of the Valley View University/Tamale West Hospital. The study protocol and participants information sheet were provided for participants to read. The aim and objectives of the study was explained to participants and written informed consent obtained prior to data collection. The participants were informed that participation is solely voluntary and no monetary compensation will be given to respondents for participating in the study. Participation in the study was voluntary, and nurses were assured of anonymity and confidentiality of their responses. Respondents were informed that they can opt out of the study at any point without any penalty and their decision will not have any consequences on them. Respondents assured of confidentiality and that no personal identifiers will be used in the questionnaire. The nurses will be informed that the study does not pose any risk to them. No compensation or monetary reimbursement will be given for participating in the study.

Comment [WU7]: Presented are very long. It is better to focus on a few key phrases

STUDY FINDINGS

A total of 125 questionnaires were distributed over a 1-month period, 123 were returned, out of which 120 were valid and completed to be included in the analysis indication a response rate of 96%.

As shown in table 1, 62 (51.7%) of participants were aged below 30years and 48 (48.3%) were of the participants were aged 30years and above. The majority 64 (53.3%) of participants were women and 56 (46.7%). More than half of the participants 68 (56.7%) held diploma, and about one-fourth of participants 30(25%) had a bachelor's degree. Only 2 nurses had a master's degree. The majority of participants 75 (73%) had less than 5 years of working experience in the Tamale West Hospital. A vast majority 110 (91.6%) of nurses reported not attending any pain management training/workshop. Most of the nurses were currently working in the medical wards 50 (41.7%). Only 20 (16.7%) of the nurses were currently working in pediatric ward. Most of the

nurses 108 (90%) stated that there was no pain management standard or protocol used as a basis in the hospital. On the other hand, 12 (10%) stated that there was a pain management standard or protocol in the hospital. For the majority of nurses' their current position was senior staff nurse 85 (70.9%), and the rest of them were staff nurses 15 (12.5%), nursing officers 10 (8.3%), and senior nursing officers (8.3%), respectively.

Table 1: Socio-demographic characteristics of participants (n=120)

Variable	Frequency	Percentage (%)
Age		
<30years	62	51.7
30years or more	58	48.3
Gender		
Male	56	46.7
Female	64	53.3
Academic degree		
Diploma	68	56.7
Bachelors	50	41.7
Masters	2	1.6
Marital status		
Single	33	27.5
Married	78	65.0
Divorced	5	4.2
Widowed	4	3.3
Working area		
Paediatric ward	20	16.7

Medical ward	50	41.7
Surgical ward	10	8.3
Emergency ward	15	12.5
Outpatient department	15	12.5
Maternity/labour ward	10	8.3
Clinical experience		
<5year	75	73
5years or more	45	37
Rank		
Staff nurse	15	12.5
Senior staff nurse	85	70.9
Nursing officer	10	8.3
Senior nursing officer	10	8.3
Pain management workshop attended		
No	110	91.6
Yes	10	9.4
Pain management protocol		
No	108	90
Yes	12	10
Having children with Pain		
Yes	68	56.7
No	52	43.3

4.3 Means and SD of Participants' Scores on Knowledge toward Pain Management (n = 120)

As shown in table 2, results revealed that the mean score of all responses was 3.19/5 (SD = 0.24), indicating that participants' knowledge on pain management in children were poor. The highest score (3.94/5, SD = 0.94) was for the item ''When a patient requests increasing amounts of analgesics to control pain, this usually indicates that the patient is psychologically dependent,'' and the lowest score (2.35/5, SD51.04) was for the item ''For effective treatment of pain it is necessary to continuously assess the pain and the efficacy of the therapy.

Results revealed that knowledge of PM and attitudes were associated with the age of the participants (P = .001), with those of 30 years and older scoring higher on the scale. There was also a positive association between knowledge of PM and five or more years of experience on the surgical ward (P = .026, P ≤ 005). Likewise, it was found that female participants' scores were higher (P = .026), and there were significant differences in participants' attitudes toward PM by academic degree of the participant (P = .026).

Table 2: Results revealed that the mean score

Item contents	Mean (SD)
Comparable stimuli in different people produce the same intensity of pain *(F)*	3.94 (0.94)
Children who will require repeated painful procedures should receive maximum treatment for the pain and anxiety of the first procedure to minimize the development of anticipatory anxiety before subsequent procedures *(T)*	3.88 (0.97)
Combining analgesics and non-drug therapies that work by different mechanisms may result in better pain control with fewer side effects than using a single analgesic agent *(T)*	3.78 (0.99)
After the initial recommended dose of opioid analgesic, subsequent doses should be adjusted in accordance with the individual patient's response *(T)*	3.06(1.20)
Parents should not be present during painful procedures *(F)*	3.67(1.00)
Spiritual beliefs may lead a child/adolescent to think that pain and suffering are necessary *(T)*	3.63 (1.11)
Ibuprofen and other non-steroidal anti-inflammatory agents are NOT effective analgesics for bone pain caused by metastases *(F)*	3.60 (1.03)
Because their nervous system is underdeveloped, children under 2 years of age have decreased pain sensitivity and limited memory of painful experiences *(F)*	3.56 (1.04)
Pediatric patients who can be distracted from pain this usually do not have severe pain *(F)*	3.50(1.02)
Benzodiazepines do not reliably potentiate the analgesia of opioids' unless the pain is related to muscle spasms *(T)*	3.49 (1.04)
Non-drug interventions are very effective for mild-moderate pain control but are rarely helpful for severe pain *(F)*	3.40(1.14)
Giving children sterile water by injection (placebo) is often a useful test to determine if the pain is real *(F)*	3.37(1.35)
An equivalent of 15 mg of oral morphine is: *(Morphine 5 mg IV)*	3.30(1.23)
Observable changes in vital signs must be relied upon to verify a child's statement that he/she has severe pain *(F)*	3.31(1.11)
The percentage of patients who over report the amount of pain they have is: (0 or 10)	3.25(1.15)
Increasing analgesic requirements are signs that the patient is becoming addicted to the narcotic	3.09 (1.19)

About 25% of patients receiving narcotics around the clock become addicted	2.68(1.11)
Estimation of pain by a nurse of physician is a valid measure of pain as patients self-report	2.38(1.03)
The likelihood of narcotic addiction in children who are being treated with opioids is: *(<1%)*	2.36(0.98)
Which of the following drugs are potentially useful for treatment of children's cancer pain? *(All of the above)*	2.35(1.04)
Overall	3.19 (1.05)

4.4 Nurses knowledge regarding children's pain management

As shown on Table 3, the top 10 items most often answered correctly by the participants centered on: the subjective and multidimensional nature of the pain experience and its treatment, the benefits of pre-emptive and multimodal analgesia, the role of parental presence during painful procedures, pain perceptions, useful pain medications and drug interactions.

Table 3. Top 10 items most often answered correctly by participants (n=120)

Item contents *(correct answer)*	f (%) Correct
Comparable stimuli in different people produce the same intensity of pain *(F)*	94 (78.3)
Children who will require repeated painful procedures should receive maximum treatment for the pain and anxiety of the first procedure to minimize the development of anticipatory anxiety before subsequent procedures *(T)*	93 (77.5)
Combining analgesics and non-drug therapies that work by different mechanisms may result in better pain control with fewer side effects than using a single analgesic agent *(T)*	84 (70)
After the initial recommended dose of opioid analgesic, subsequent doses should be adjusted in accordance with the individual patient's response *(T)*	83 (69.1)
Parents should not be present during painful procedures *(F)*	81 (67.5)
Spiritual beliefs may lead a child/adolescent to think that pain and suffering are necessary *(T)*	69 (57.5)
Ibuprofen and other non-steroidal anti-inflammatory agents are NOT effective analgesics for bone pain caused by metastases *(F)*	68 (56.7)
Because their nervous system is underdeveloped, children under 2 years of age have decreased pain sensitivity and limited memory of painful experiences *(F)*	67 (55.8)
Pediatric patients who can be distracted from pain this usually do not have severe pain *(F)*	67 (55.8)
Benzodiazepines do not reliably potentiate the analgesia of opioids' unless the pain is related to muscle spasms *(T)*	66 (55.0)

Note: f – Frequency; % – Percentage; T – True; F – False

DISCUSSION

Knowledge and attitude on pain management

The current study aimed at assessing nurses' knowledge and attitudes regarding children's pain at the Tamae West Hospital in Ghana. Additionally, the researcher was interested in examining the socio-demographic factors that influence their pediatric pain knowledge and attitudes. The overall aim of this study was to provide baseline information to guide the development and implementation of a pediatric pain educational program for nurses for improved pediatric pain assessment and management. The study informed national and international literature by bringing new data about nurses in an area of limited knowledge.

The mean score of all responses was 3.12, indicating that participants' knowledge and attitudes were poor, corroborating findings from previous studies and reiterating the global concern about this issue among nurses who care for patients experiencing pain (Gupta, Sahi, Bhargava & Talwar, 2015; Schroeder, Hoffman, Fioravanti, Poskus, Medley et al., 2016). There appears to be an internationally recognized knowledge and attitudes deficits among nurses on this subject (Smeland, Twycross, Lundeberg & Rustøen, 2018; Stanley & Pollard, 2013; Ekim & Ocakci, 2013). One of the possible reasons for this trend may be related to the insufficient pediatric pain management training in nursing curricula (Mackintosh-Franklin, 2017; Twycross & Roderique, 2013). Limited continuing educational opportunities for post-registration nurses on this subject may also be responsible for these outcomes (Samarkandi, 2018; Eid, Manias, Bucknall & Almazrooa, 2014). Due to these insufficiencies in knowledge

and attitudes, pain in children globally remains inadequately managed, which leads to unnecessary suffering in this vulnerable population. The universal nature of the problem is reflected specifically in this study by the mean score achieved by nurses (3.12 in 63.9% of Jordanian nurses), which is close to that reported for nurses in the United Kingdom (3.20 in 65.7% of nurses in the United Kingdom) (Vickers, Wright & Staines, 2014). Other studies also re- ported generally poor nurses' knowledge of PM, where the mean scores fell in the range from 39.7% to 72.3% (Kassa & Kassa, 2014; Manwere, Chipfuwa, Mukwamba & Chironda, 2015; Omran, Al Qadire, Ali & Al Hayek, 2014). There is an apparent reported deficit in nursing knowledge of PM among nurses from different countries around the globe, and this is alarming. These mean scores mean that when nurses yield a score less than the threshold of 80%, their ability to care for patients experiencing pain might be considerably compromised (McCaffery & Robinson, 2002; Vickers, Wright & Staines, 2014), which is likely to contribute to unpleasant or negative patient experiences of PM, leading to low satisfaction with care.

A major concern observed in the current study was the inadequacy of knowledge and attitudes related to pain assessment, analgesics and pharmacokinetics (drug administration, distribution, metabolism and elimination), similar to previous studies (Ortiz, Ponce-Monter, Rangel-Flores, Castro-Gamez, Romero-Quezada et al., 2015; Al Omari, 2015; Gadallah, Hassan & Shargawy, 2019). Greater emphasis should be placed on these areas during the development and implementation of educational interventions on pediatric pain. Consistent with earlier studies (Kheshti, Namazi, Mehrabi & Firouzabadi, 2016; Becker, Dorflinger, Edmond, Islam, Heapy et al., 2019; Ortiz, Ponce-Monter, Rangel-Flores, Castro-Gamez, Romero-Quezada et al., 2015) majority of the studied participants believed that the giving of placebo injection is a useful test for determining the veracity of patient's pain and equally perceived non-pharmacological interventions to be ineffective in managing severe pain. This

suggests that the students did not believe in patient's self-report of pain despite the evidence that it is the best way of assessing and evaluating a patient's pain (McCaffery, Ferrell & Pasero, 2000). It also further demonstrates that, majority of nursing and midwifery students harbour misconceptions about the efficacy on non-pharmacological pain management interventions. Non-pharmacological interventions have been shown to reduce pain associated with diverse causes and procedures (Tick, Nielsen, Pelletier, Bonakdar & Simmons, 2018). The use of non-pharmacological interventions should therefore be encouraged as they reduce the amount of analgesic consumption needed in treating pain and associated side effects (McSherry, Atterbury, Gartner, Helmold, Searles et al., 2018; Rosendahl, Koranyi, Jacob, Zech & Hansen, 2019; Grissa, Baccouche, Boubaker, Beltaief, Bzeouich et al., 2016). In the present study, most of the nurses answered the questions about pharmacology and addiction incorrectly. This finding corroborates a study by Alotaibi et al. (2019) where the majority of nurses had insufficient knowledge regarding pharmacological management of pain. Education on pharmacological management of pain needs to be intensified in nursing curricula and regular in-service training organized for practicing nurses to enhance their knowledge on pharmacological interventions in pain management.

Consistent with a study by Amponsah et al. (2020), the present study found out that all the participants could not accurately determine the onset of action of orally administered analgesics, equianalgesic dose of orally administered morphine, and the right dosage of prescribed morphine for a child who consistently reported of moderate to severe pain. These results are of great concern as these nurses are already practicing in hospitals and may end up mismanaging children's pain. As the problem of poor assessment and management of children's pain persists among nurses, there is an urgent need to develop, implement and evaluate pain educational interventions especially in resource constrained setting to improve pain management for vulnerable children and their families.

Association between participants' characteristics and pain management

Although the mean scores of nurses in knowledge and attitudes scales were poor overall, further analysis revealed some statistical differences among different personal characteristics. Participants aged more than 30 years scored higher on the attitudes scale (P5 .001), similar to findings of studies conducted in Zimbabwe and Malaysia, where nurses aged greater than 40 years had better knowledge of PM. (Manwere, Chipfuwa, Mukwamba & Chironda, 2015; Ho, Ho & Pang, 2015).

There was also an association between years of experience and knowledge about PM, which is supported by earlier research findings (Manwere, Chipfuwa, Mukwamba & Chironda, 2015; Lui, So & Fong, 2008). In contrast, a study in Turkey (Manwere, Chipfuwa, Mukwamba & Chironda, 2015) found a negative correlation between the mean scores on the attitudes scale, and both age and working experience as older nurses had less positive attitudes toward PM, and less years of experience were also associated with lower mean scores on the scale. In this context, this might indicate that older nurses are more likely to hold negative attitudes and poor knowledge regarding PM. Nevertheless, other studies revealed that there was no significant difference among nurses' pain knowledge among subgroups for variables such as nurses' age, nursing experience years, and ranks (Lobo & Martins, 2013). In the present study, older and more experienced nurses scored higher compared with their younger counterparts, which may be related to the post qualification education within the target hospital, as senior nurses with adequate training in PM are often the decision makers about pain relief on the wards. There were significant differences in participants' attitudes toward PM related to the academic degree in nursing, in favor of those who have master's degrees in nursing. However, the number of master holders in this study is too small (only 2 participants) to draw meaningful conclusions for clinical practice, but it certainly indicates that further advanced education positively changes or reshapes nurses'

knowledge and attitudes toward PM. Again, it is too early to make such conclusions and further investigation into this issue is warranted. Indeed, hospital-based PM training has been found to be associated with better decision-making processes, knowledge, and attitudes, consequently promoting pain relief among patients (Silva, Pimenta & Cruz, 2013; Shawhan-Akl, 2016).

Previous studies found that women were more sensitive to the experience of pain than men (Bernardes, Silva, Carvalho, Costa & Pereira, 2014; Koren, Peled, Trogan, Norman, Berkovich et al., 2015). As in most cultures, women generally adopt the family caregiver role in northern Ghana, which might endow them with latent skills and folk knowledge in dealing with illness- associated suffering and pain. Indeed, unlike male nurses, female nurses in Ghana look after both male and female patients, and presumably this might maximize their knowledge base and skills in pain management. However, at any rate, the mean scores of male nurses indicate the need for additional assistance to improve the efficacy of their pain management role within the healthcare context.

CONCLUSION

Comment [WU9]: Strengths and weaknesses of the study?

The study revealed that nurses at the Tamale West Hospital in Ghana generally have insufficient knowledge and attitudes toward pain in children. There is the urgent need to intensify education in this area so as to adequately prepare these nurses to cater for the pain needs of vulnerable children and their families. Future studies should focus on how student's theoretical knowledge and attitudes are linked to their pediatric pain assessment and management practices.

COMPETING INTERESTS DISCLAIMER:

Authors have declared that no competing interests exist. The products used for this research are commonly and predominantly use products in our area of research and country. There is absolutely no conflict of interest between the authors and producers of the products because we do not intend to use these products as an avenue for any litigation but for the advancement of knowledge. Also, the research was not funded by the producing company rather it was funded by personal efforts of the authors.

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Comment [WU10]: Some sources are outdated and should be replaced with newer prohibitions. These sources are marked in yellow

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