Original Research Article

Nurses' Knowledge and Attitudes towards Paediatric Pain Management in Jouf City, Saudi Arabia

Reem F Alshammari[1], Deema J Alrwili[1], Wesam M Alrwili[1], Renad M, Alrwili[1], Dana S Alrwili[1], Nimah M Alrwili[1], Shamaa H, Alshammari[1], Shahenda A Salih[2*], Wafa Abdein Humza Bashir[3]

[1]Internship Student, College of Nursing Science, Jouf University, Saudi Arabia
[2]Assistant Professor, College of Nursing Science, Department of Maternal and Child Health Nursing, Sekaka, Jouf University, Saudi Arabia
[3]Faculty of Nursing Sciences, Jazan University, Saudi Arabia

*Corresponding author: Shahenda A. Salih
Assistant Professor, College of Nursing Science, Department of Maternal and Child Health Nursing, Sekaka, Jouf University, Saudi Arabia

Abstract

Background: Pain is a significant and possibly debilitating symptom for children and it can affect the quality of life. Poorly relieved pain has been associated with negative outcomes including delayed recovery and increased likelihood of early death. The study aimed to assess nurses' knowledge and attitudes towards managing Paediatric pain in Jouf region. **Methods**: This study adopted the quantitative research approach through conducting across-sectional survey. **Results**: The results showed that nurses' had a moderate level of knowledge about pain management of Paediatric patients (15.15±4.3), and had neutral attitudes towards pain management among Paediatric patients (2.67±0.62) **Conclusion:** Educational and training programs should be conducted for nurses in the field of Paediatric Pain Management in Jouf region hospitals.
Keywords: Pain Management, Paediatric, Assessment, Knowledge, Attitudes, Nurses.

INTRODUCTION

Pain is defined as "an unpleasant sensory and emotional experience associated with, or resembling that associated with actual or potential tissue damage" (Raja *et al.,* 2020) (Wicksell *et al.,* 2009). With adults, it is really easy to figure out how much pain they are in, but it is very difficult in children. There are a lot of different skills out there and ways to measure pain all the way from newborns and through adolescents (Goldsmith *et al.,* 2018).

Assessment of pain and interventions for pain management are important components of nursing care for children of all ages (Pancekauskaitė & Jankauskaitė, 2018). Children and infants, even premature feel pain just as much as adults too. Infants who can't tell about their pain will give the healthcare providers other signals; they may cry, make a face as though they are in pain, or they may have an increased heart rate (Morad & Farrokh, 2018).

Different studies have discussed the topic of nurses' knowledge and attitudes related to Paediatric pain management. For example, Alotaibi *et al.,* (2019) carried out a cross-sectional study that aimed at assessing the level of Saudi nurses' knowledge and attitudes towards Paediatric pain management. The researchers adopted the cross-sectional survey design. A sample of 410 Saudi nurses was recruited in this study. The findings of the study showed that Saudi nurses working in Paediatric departments have poor level of knowledge and attitudes regarding Paediatric pain management.

In another study conducted by Smeland *et al.,* (2018), which sought at assessing the knowledge, attitudes and practices (KAP) of Paediatric nurses towards Paediatric pain management. The study was a cross-sectional survey that was administered over a sample of 193 nurses. The Norwegian version of the "The Paediatric Nurses' Knowledge and Attitudes

Survey PNKAS" was used to collect data from the participating nurses. The findings of the study revealed that Paediatric nurses had poor knowledge in the domain related to pharmacological management of Paediatric pain. Overall, the nurses had poor levels of KAPs related to managing pain in Paediatric patients. However, it was found that pain in the studied settings was assessed using valid and reliable tools.

Gadallah *et al.,* (2017) performed a cross-sectional study that aimed at assessing the level of University nursing students' knowledge and attitudes practices regarding Paediatric pain management. The researchers used the PNKAS tool to collect data from the study participants. The study findings showed that Egyptian university nursing students had low level of knowledge and attitudes about pain management among Paediatric patients. The most reported weak aspect of pain management knowledge was the pharmacological treatment of pain among Paediatric patients.

Moreover, Amponsah *et al.,* (2019) conducted a study that aimed at assessing the level of nursing students and nurses' knowledge and attitudes towards pain management of Paediatric patients. A cross-sectional research design was used in this study. A sample of 554 undergraduate nursing students and 65 nurses was recruited in this study. The findings of this study showed that both nurses and nursing students had poor level of knowledge regarding pain assessment and management among Paediatric patients. Physiology of pain and pharmacological treatments of pain were the highest scored domains of Paediatric pain management among nursing students.

In Ghana, Wuni *et al.,* (2020) carried out a cross-sectional study that sought to assess the level of knowledge and obstacles of Paediatric pain management among Paediatric nurses in a teaching hospital in Ghana. A sample of 180 nurses participated in this study. The results of the study showed that a high majority of the participating nurses had good level of knowledge regarding pain management among Paediatric patients. However, exploring the barriers of pain management among Paediatric patients revealed that lack of knowledge resources, lack of valid and reliable tools and lack of staff were the most reported barriers that could limit the practice of assessing pain among Paediatric patients.

In an integrative review that was carried out by Alotaibi *et al.,* (2018), the purpose was to provide a research- based evidence regarding nurses' knowledge and attitudes, in addition to the obstacles and facilitating factors that influence Paediatric pain management. Using different databases and designed search protocol, Alotaibi *et al.,* (2018) found that only 27 research articles could be included to elicit the research based evidence. The results of the study showed that there is an international pattern of poor nurses' knowledge and attitudes towards pain management among Paediatric patients. In addition, it was found that lack of knowledge, lack of valid and reliable tools, reluctance of child family were the most reported barriers of Paediatric pain management as reported by the participating parents. On the other hand, it was found that parents' participation and the good relationship between the nurse and the patient's family were the most reported factors facilitating pain assessment and management among Paediatric nurses.

In Australia, Peirce *et al.,* (2018) carried out a cross-sectional study to assess the nurses' knowledge and attitudes towards pain management in Paediatric patients. The study adopted the cross-sectional research approach. The sample of the study consisted of 590 nurses who filled a revised version of "the Paediatric Pain Knowledge and Attitudes Questionnaire". The results of the study revealed that Australian nurses had good and sufficient level of knowledge and positive attitudes towards pain management in Paediatric patients. In addition, the results showed significant differences in knowledge scores referred to kind of nursing profession, either clinical or registered nurse. Moreover, it was found that the level of nurses' education significantly affected the level of nurses' knowledge related to Paediatric pain management.

In Malawi, Kholowa *et al.,* (2017) carried out a cross-sectional study that aimed at assessing nurses' knowledge and attitudes towards pain management among Paediatric patients. This was a qualitative research study that recruited seventeen nurses who were subjected to semi-structured interviews by the research team. The findings of the study showed that nurses had sufficient knowledge regarding pain assessment and pharmacological treatments of pain among Paediatric patients. However, it was found that nurses had insufficient knowledge in specific fields related to Paediatric pain assessment, such as using validated scale and using analgesics.

Oduro *et al.,* (2020) performed a study that aimed at assessing nurses' knowledge and attitudes towards pain management among Paediatric patients. This study adopted the cross-sectional research design. The study recruited a sample of 65 nurses from 8 hospitals in Ghana. The researchers used PNKAS tool to collect data from the participating nurses. The findings of the study showed that nurses had insufficient knowledge and attitudes level about Paediatric pain management. The study recommended enrolling the nurses in continuous educational and practical courses to improve their knowledge and attitudes towards pain assessment and management of Paediatric patients.

In India, Elias *et al.,* (2019) conducted a study that sought to assess the level of knowledge and attitudes towards Paediatric pain management among

Indian nurses. The study adopted the cross-sectional research design through recruitment of 120Indian nurses from different hospitals. To collect data, the researchers used a researcher-developed questionnaire. The results of the study revealed that the participating nurses were divided equally between moderate and low level of knowledge and attitudes towards pain management of Paediatric patients. In addition, the study reported that fear of tolerance to pain killers and delays of prescribing medicines were the most reported barriers by the participating nurses, which could limit the increased knowledge and attitudes towards Paediatric pain management.

Agyemang *et al.,* (2020) conducted a cross-sectional study that aimed at assessing nursing students' knowledge and attitudes towards Paediatric pain management. The cross-sectional research design was used in this study. The PNKAS tool was used to collect data from the study participants. A sample of 554 university students was recruited in this study. The results of the study showed that the participating university nursing students had moderate level of knowledge and attitudes towards Paediatric pain management.

Vagnoli *et al.,* (2019) carried out a cross-sectional study that assessed the level of physicians and nurses' knowledge and attitudes towards pain management in Paediatric patients. A sample of 692 nurses and physicians were enrolled in this survey. The researchers used a self-filled questionnaire to collect data from the study participants. The results of the study showed that both nurses and physicians had good level of knowledge and attitudes towards Paediatric pain management. In addition, the study showed that there were no significant differences between nurses and physicians with regard to their level of knowledge and attitudes towards Paediatric pain management.

Fowler *et al.,* (2020) performed a cross-sectional study that aimed at assessing the levels of knowledge and attitudes of Canadian Paediatric physicians towards pain management of Paediatric patients. A sample of 224 physicians participated in this study through filling a self-filled questionnaire. The findings of the study showed that emergency department Paediatric physicians had low levels of knowledge and attitudes toward pain management in Paediatric patients. The participants showed no concerns regarding patients' dependency and risk of addiction.

In Taiwan, Peng *et al.,* (2020) carried out a cross-sectional study that assessed the level of knowledge and attitudes of Taiwanese physicians towards Paediatric pain management. A researcher-developed questionnaire was used to collect data from the study participants. A sample of 264 physicians was included in this study. The results of the study showed that the Taiwanese physicians had a low level of knowledge and attitudes regarding pain management of Paediatric patients. The study recommended conducted further educational sessions and practical training to improve the physicians' knowledge and attitudes towards managing Paediatric pain.

Maghami *et al.,* (2016) surveyed Iranian neonatal nurses to assess their level of knowledge and attitudes towards pain management of Paediatric patients. The study adopted the cross-sectional survey design through administering a study questionnaire (researcher-developed and self-filled) over a sample of 76 neonatal nurses in Iranian public hospitals. The findings of the study showed that the participating neonatal nurses had good and sufficient level of knowledge and attitudes towards pain management of neonates. In addition, it was found that the educational level is a significant factor influencing the nurses' level of knowledge and attitudes towards Paediatric pain management.

Problem Statement and Purpose

Assessing pain among Paediatric patients requires a sufficient knowledge among nurses. This might be referred to that Paediatric patients are less able to report their pain to the nursing staff (Alotaibi *et al.,* 2018). In addition, assessing pain among Paediatric patients requires the nurses to be positively oriented towards managing pain among Paediatric patients, which significantly improves the quality of healthcare (Bailey *et al.,* 2021).

There is a significant lack of studies examining nurses' knowledge and attitudes towards managing Paediatric pain in Jouf region. Therefore, it is necessary to fill the gap related to nurses' knowledge and attitudes towards Paediatric pain management. In addition, an overwhelming concern of this study is to provide a baseline data that could help in designing interventional programs to improve the nurses' practices related to managing pain among Paediatric patients.

Research Objectives
The objectives of the study can be summarized as follows:
- To Assess the nurses' knowledge regarding pain management of Paediatric patients
- To explore the nurses' attitudes towards pain management of Paediatric patients.

Research Questions
1. What is the level of nurses' knowledge regarding pain management of Paediatric patients at Jouf city hospitals?
2. What are the attitudes of nurses' towards pain management of Paediatric patients at Jouf city hospitals?

RESEARCH DESIGN / METHODOLOGY

This study adopted the quantitative research approach through conducting across-sectional survey.

Data Collection Methods

To collect data from the study participants, the researchers designed a questionnaire that was distributed over the study participants. The study questionnaire was bilingual, both Arabic and English versions. The questionnaire was converted into an electronic form using Google forms service and distributed to the nurses in the selected hospitals. The recruitment process included contacting the head nurses at the selected hospital, specifically in the Paediatric departments and asks them to distribute a specific consent form for the Paediatric nurses to ensure their participation in this study. Those who agree to participate had to provide their phone number in order to receive the questionnaire link.

Finally, the online form of the study questionnaire was available for two weeks to ensure the recruitment of the highest number of the study participants.

Population and Setting

The population of this study was all Paediatric nurses who are working in the inpatient Paediatric departments and outpatient clinics in three selected governmental hospital at Jouf city.

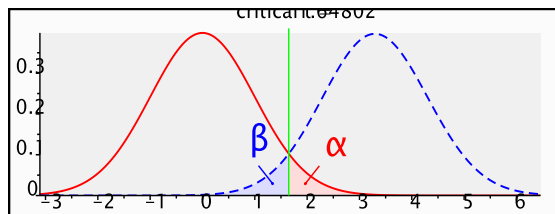The study setting will be Prince Met'eb bin Abdul-Aziz hospital, Maternity and Paediatric Hospital in Al-Jouf and King Abdul-Aziz specialist hospital. These hospitals are located in Sakaka governorate and provide healthcare services for the city population (Ministry of health, 2021).

Prince Met'eb bin Abdul-Aziz hospital has a capacity of 300 beds and include a specialized Paediatric department and a Paediatric ICU. In addition, the maternity and Paediatric hospital provide specialized healthcare services for maternity and Paediatric departments. Moreover, King Abdul-Aziz specialist hospital provides Paediatric healthcare services either for hospitalized Paediatric patients in the Paediatric department or the Paediatric ICU, or for Paediatric patients attending the outpatient clinics. Finally, based on the statistical data released from the ministry of health, the number of Paediatric nurses working in these three hospitals is around 406 nurses from different socioeconomic and educational backgrounds (ministry of health, 2019).

Sampling Strategy and Sample Size

Convenience sampling method was used in this study:

The sample of the study was calculated using G*Power 3.1.9.7 software, with related t-test, a critical t equals to 1.648 and an effect size of 0.3 (Alotaibi *et al.*, 2018), a statistical significance threshold of ($\alpha \leq 0.05$), the total sample size was 97 participants. This sample was representative for the study population as it provides a power of 0.95 for the study.

Inclusion and Exclusion Criteria

Inclusion Criteria

- Nursing profession in a Paediatric department or unit.
- Has at least six months of work experience (to ensure that the nurse has passed the orientation period).
- Willing to participate in the study.

Exclusion Criteria

- Nurses who work in departments and units other than paediatrics will be excluded.
- Nurses who have less than 6 months of professional experience will be excluded.

Ethical Approvals

The current research was conducted within the code of research ethics adopted in Jouf University. The researchers obtained the ethical approval from the Local Committee of Bioethics at Jouf University and the ethical approval from the ministry for health to collect data from the selected settings.

In addition, the researchers ensured the participants' voluntary participation through getting a written consent from the participants that they are volunteering to participate in this study. Moreover, the researchers ensured that participants are not exposed to any harm during the data collection process, this was ensured through ensuring the privacy and

confidentiality of the participants' identities, mobile numbers, and responses (Connelly, 2014).

Data Analysis Plan

After collecting the data from the study participants using Google forms service, the data on the electronically generated Excel sheet was checked for completeness and was transferred to the Statistical Package of Social Sciences (SPSS, v. 26.0, IBM Corp.). The data was coded based on the variables of the study and cleaned through removing inappropriate and noisy data.

The descriptive statistics such as frequencies, percentages, means and standard deviations were used to analyse the participants' demographic data and responses to the knowledge and attitudes scale. In addition, the Independent samples t-test and the One-Way Analysis of Variance (ANOVA) were used to identify any significant statistical difference in the participants' responses to the knowledge and attitudes scale based on their demographic characteristics.

RESULTS

Table 1: Nurses' Socio-demographic characteristics

Variable	M (SD)	F (%)
Age	30.2(5.2)	
Gender		
Female		53(54.6)
Male		44(45.4)
Educational Level		
Diploma		8 (8.2)
Bachelor		83 (85.6)
Master or PhD		6 (6.2)
Years of Experience		
Less than 5 years		15 (15.5)
5 – 10 years		69 (71.1)
More than 10 years		13 (13.4)

The results shown in table (1) represent the socio-demographic characteristics of the participating nurses. The results showed that the mean age of the participating nurses was 30.2±5.2. Females constituted 54.6% (n=53) whereas males constituted 45.4% (n=44).

Distributing the study participants based on the educational qualification revealed that nurses who had diploma degree constituted 8.2% (n=8), whereas nurses who had bachelor degree and master or PhD degree constituted 85.6% (n=83) and 6.2% (n=6), respectively.

Categorizing the participating nurses based on their years of experience showed that nurses who had less than 5 years of experience constituted 15.5% (n=15), nurses who had 5 to 10 years of experience constituted 71.1% (n=69), and nurses who had more than 10 years of experience were constituting 13.4% (n=13).

Table 2: Nurses' responses to knowledge scale

Variable	M±SD	Rank
vital signs are reliable indicators of pain intensity among Paediatric patients	1.51±0.50	4
infants are less sensitive to pain compared to adults due to underdevelopment of their nervous system	1.46±0.50	8
if children are distracted from pain they won't suffer severe pain	1.53±0.50	2
NSAIDS and other analgesics are not efficient to alleviate pain of chronic conditions among children	1.48±0.50	6
children may fall asleep even they are suffering from pain	1.45±0.50	9
when source of pain is unknown, opioids are not recommended	1.54±0.50	1
there is a dose ceiling of morphine when given to Paediatric patients	1.52±0.50	3
Paediatric patients might suffer from substance abuse if their pain is treated with morphine	1.49±0.50	5
using sterile water as injection could help the nurse if the pain is real	1.47±0.50	7
analgesics have less duration compared to morphine	1.44±0.50	10
Total	**15.15±4.3**	**Moderate**

The results shown in table (2) represent the nurses' responses to the knowledge of Paediatric pain management scale. The results showed that nurses' had a moderate level of knowledge about pain management of Paediatric patients (15.15±4.3). The highest knowledge scores were obtained at "when source of pain is unknown, opioids are not recommended) that got a score of (1.54±0.50) and for "if children are

distracted from pain they won't suffer severe pain) that got a score of (1.53±0.50). On the other hand, the lowest knowledge scores were for the items; "children may fall asleep even they are suffering from pain) that

got a score of (1.45±0.50) and for "analgesics have less duration compared to morphine) that got a score of (1.44±0.50).

Table 3: Nurses' responses to attitudes scale

Variable	M±SD	Rank
I think using pain assessment scale is a major step in managing Paediatric patients' pain	2.63±1.4	9
recognizing pain source should be ensured before determining the pain management plan	2.69±1.4	3
There is a need of family support when managing pain of Paediatric patients	2.65±1.4	7
managing pain of Paediatric patients requires higher nursing skills compared to adult patients' pain management	2.66±1.4	6
nurses could assess and manage pain of Paediatric patients without using valid and reliable scales	2.67±1.4	5
pain management plan of Paediatric patients should start with administering analgesics at low doses	2.64±1.4	8
pain management of Paediatric patients is a continuous process	2.7±1.38	2
continuous pain among Paediatric patients should be treated by opioids administration	2.68±1.37	4
Paediatric patients should be stabilized in non-pain state	2.74±1.40	1
no pain expression among Paediatric patients indicates no pain	2.61±1.35	10
Total	**2.67±0.62**	**Neutral**

The results shown in table (3) represent the nurses' response to attitudes towards pain management in children scale. The results showed that highest positive attitudes towards pain management in children was for the item stating that "Paediatric patients should be stabilized in non-pain state" that got a score of (2.74±1.40) and the item stating that "pain management of Paediatric patients is a continuous process) that got a score of (2.7±1.38). However, the most negative attitudes was for the item stating that "I think using pain assessment scale is a major step in managing Paediatric patients' pain" that got a score of (2.63±1.4) and for the item stating that "no pain expression among Paediatric patients indicates no pain" that got a score of (2.61±1.35).

Totally, the results showed that the participating nurses had neutral attitudes towards pain management among Paediatric patients (2.67±0.62).

DISCUSSION
The findings of the present study showed that nurses have moderate level of knowledge and neutral attitudes towards pain management in children. This result might be referred to that managing pain in children requires more professional practice compared to managing pain in adults who are able to express their pain either verbally or non- verbally. However, previous studies, such as Alotaibi *et al.,* (2018) reported a poor level of knowledge and attitudes towards Paediatric pain management among Saudi nurses. This could highlight a significant improvement in nurses' knowledge and attitudes towards Paediatric pain management. This improvement might be referred to the efforts of ministry of health in improving healthcare workers' professional practices through educational program offered to Saudi healthcare workers.

In addition, the results of the present study are inconsistent with the findings reported by Peng *et al.,* (2020) and Maghami *et al.,* (2016) who found that nurses had low and good levels of knowledge and attitudes towards pain management, respectively.

Limitations
Despite the significant findings reported in this study, still there are a number of limitations that could limit the generalization of the present study.

First are the time limitations, as this study was conducted in a short time period and this affected recruiting higher numbers of nurses. A second limitation is the researchers' experience in reviewing the literature and providing critical analysis of the findings of the previous studies, in addition to the researcher's lack of experiencing in designing a study questionnaire and analysing the participants' responses.

RECOMMENDATIONS
Based on the findings of the present study, the researchers would like to highlight that:
1. Assessing nurses' knowledge and attitudes towards Paediatric pain management significantly provides an overview of the educational and training needs in the field of assessing pain among children. Moreover, this study recommends conducting further research to assess the correlation of nurses' demographic characteristics and their levels of knowledge and attitudes towards Paediatric pain management.
2. Increasing nurses' knowledge and attitudes towards Paediatric pain management significantly improves the clinical practice of the nurses, which will

consequently be reflected on the quality of healthcare services provided for Paediatric patients.

ACKNOWLEDGMENTS

REFERENCES

- Agyemang, J. B., Kusi-Amponsah Diji, A., Adongo Afaya, R., Boakye, H., Oduro, E., Amagyei, A., & Kyei-Dompim, J. (2020). Nursing and Midwifery Students' Knowledge and Attitudes Regarding Children's Pain. *Journal of Research Development in Nursing and Midwifery*, *17*(2), 7-10.
- Alotaibi, K., Higgins, I., & Chan, S. (2019). Nurses' knowledge and attitude toward Paediatric pain management: a cross-sectional study. *Pain Management Nursing*, *20*(2), 118-125.
- Alotaibi, K., Higgins, I., Day, J., & Chan, S. (2018). Paediatric pain management: knowledge, attitudes, barriers and facilitators among nurses–integrative review. *International Nursing Review*, *65*(4), 524-533.
- Amponsah, A., Oduro, E., Bam, V., Kyei-Dompim, J., Ahoto, C. K., & Axelin, A. (2019). Nursing students and nurses' knowledge and attitudes regarding children's pain: A comparative cross-sectional study. *PloS one*, *14*(10), e0223730.
- Bailey, L. C., Razzaghi, H., Burrows, E. K., Bunnell, H. T., Camacho, P. E., Christakis, D. A., ... & Forrest, C. B. (2021). Assessment of 135 794 Paediatric patients tested for severe acute respiratory syndrome coronavirus 2 across the United States. *JAMA Paediatrics*, *175*(2), 176-184.
- Cox, K. A. (2019). 4 Quantitative Research Designs. *Research Design and Methods: An Applied Guide for the Scholar-Practitioner*.
- Dannels, S. A. (2018). Research design. In *The reviewer's guide to quantitative methods in the social sciences* (pp. 402-416). Routledge.
- Elias, J. M., Prashanth, P. V., Shenai, N. A., & Varghese, S. M. (2019). Knowledge and Attitude Regarding Children's Pain and Perceived Barriers to Optimal Pain Management among Staff Nurses. *International Journal of Nursing Education*, *11*(1).
- Fowler, M., Ali, S., Gouin, S., Drendel, A. L., Poonai, N., Yaskina, M., ... & Dong, K. (2020). Knowledge, attitudes and practices of Canadian Paediatric emergency physicians regarding short-term opioid use: a descriptive, cross-sectional survey. *CMAJ open*, *8*(1), E148.
- Gadallah, M. A., Hassan, A. M., & Shargawy, S. A. (2017). Undergraduate nursing students' knowledge and attitude regarding pain management of children in Upper Egypt. *J Nurs Educ Pract*, *7*(6), 101-108.
- Goldsmith, H., McCloughen, A., & Curtis, K. (2018). The experience and understanding of pain management in recently discharged adult trauma patients: A qualitative study. *Injury*, *49*(1), 110-116.
- Kholowa, E. T., Chimwaza, A. F., Majamanda, M. D., & Maluwa, A. O. (2017). Nurses' Knowledge and Attitudes towards Pain Management in Children Admitted in the Paediatric Department of Queen Elizabeth Central Hospital, Blantyre, Malawi. *Journal of Biosciences and Medicines,* 5(06), 46.
- Maghami, M., Aghababaeian, H., Majin, S. A., Moosavi, A., & Tahery, N. (2016). Knowledge, attitude and performance of the nurses working in neonatal wards about treatment of pain in neonates. *Journal of Chemical and Pharmaceutical Sciences*, *9*(4), 2796-2801.
- Moh.gov.sa. 2021. *Ministry of Health*. [online] Available at: <https://www.moh.gov.sa> [Accessed 4 November 2021].
- Morad, A., & Farrokh, S. (2018). Pain management. *Essentials of Anesthesia for Neurotrauma*, 447-460.
- Oduro, E., Diji, A. K. A., Kusi, G., Amagyei, A., Kyei-Dompim, J., Lomotey, A., ... & Budu, H. I. (2020). Children's Nurses' Knowledge and Attitudes on Paediatric Pain: A Descriptive Cross-Sectional Survey in a Developing Country. *Nurse Media Journal of Nursing*, *10*(3), 222-233.
- Pancekauskaitė, G., & Jankauskaitė, L. (2018). Paediatric pain medicine: pain differences, recognition and coping acute procedural pain in Paediatric emergency room. *Medicina*, *54*(6), 94.
- Peirce, D., Corkish, V., Lane, M., & Wilson, S. (2018). Nurses' knowledge and attitudes regarding Paediatric pain management in Western Australia. *Pain Management Nursing*, *19*(6), 707-717.
- Peng, N. H., Lao, A. H. C., Chen, C. H., Lee, M. C., Chiang, L. W., Chang, Y. C., & Liu, H. F. (2020). Knowledge and attitudes of Paediatric clinicians regarding Paediatric pain management. *Journal for Specialists in Paediatric Nursing*, *25*(4), e12302.
- Raja, S. N., Carr, D. B., Cohen, M., Finnerup, N. B., Flor, H., Gibson, S., ... & Vader, K. (2020). The revised International Association for the Study of Pain definition of pain: concepts, challenges, and compromises. *Pain*, *161*(9), 1976-1982.
- Smeland, A. H., Twycross, A., Lundeberg, S., & Rustøen, T. (2018). Nurses' knowledge, attitudes and clinical practice in Paediatric postoperative pain management. *Pain Management Nursing*, *19*(6), 585-598.
- Vagnoli, L., Mammucari, M., Graziani, D., & Messeri, A. (2019). Doctors and nurses' knowledge and attitudes towards Paediatric pain management: An exploratory survey in a children's hospital. *Journal of pain & palliative care pharmacotherapy*, *33*(3-4), 107-119.
- Wuni, A., Salia, S. M., Mohammed Ibrahim, M., Iddriss, I., Abena Nyarko, B., Nabila Seini, S., ... & Mohammed, J. (2020). Evaluating Knowledge, Practices, and Barriers of Paediatric Pain Management among Nurses in a Tertiary Health Facility in the Northern Region of Ghana: A Descriptive Cross-Sectional Study. *Pain Research and Management*, *2020*.