

Original Research

Assessing knowledge, attitude and practice of community pharmacists on the pain management and implications in UAE children

Ammar Abdulrahman Jairoun , Sabaa Saleh Al-Hemyari , Moyad Shahwan , Maimona Jairoun , Amanj Kurdi , Brian Godman 

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Abstract

Objective: There are concerns with the optimal management of pain in children, with sub-optimal management negatively impacting on physical, emotional social functioning, exacerbated by pain in children being multi-modal. Community pharmacists across countries play an important role in managing pain in patients including children's pain. Consequently, the objective of this study is to assess knowledge, attitudes and practices (KAP) of pain management in children among community pharmacists in UAE. **Methods:** A cross-sectional study was conducted using a structured questionnaire that was developed and piloted. The final questionnaire, which comprised two parts, had acceptable validity and internal consistency. **Results:** 867 out of 922 community pharmacists took part in UAE (94% response rate) and were visited by trained researchers. The most from independent pharmacies (53.9%) and having more than 10 years of experience (68.9%). The overall KAP score was 70%, with gender, pharmacy type, years of experience, educational level and position significantly associated with KAP. Encouraging knowledge areas included pain is one of the vital signs in children (88.6%), the intensity of pain should be rated by a pharmacist before discussing treatment options (92.2%) and the choice of treatment should depend on issues including intensity and duration (87.2%). Areas of concern included the contents of the WHO analgesic ladder (32.0%) and children may sleep in spite of severe pain (42.9%). **Conclusion:** There were areas of good knowledge of pain management among community pharmacists in UAE. Areas of concern including knowledge of the WHO analgesic ladder need to be addressed as part of future educational input during training and post qualification.

Keywords: Pediatric pain; Children pain; Community pharmacists; Knowledge; Attitudes; UAE

Ammar Abdulrahman JAIROUN*. School of Pharmaceutical Sciences, Universiti Sains Malaysia, Pulau Pinang, Gelugor 11800, Malaysia. Health and Safety Department, Dubai Municipality, Dubai, UAE. Dr_ammr_91@hotmail.com

Sabaa Saleh AL-HEMYARI. School of Pharmaceutical Sciences, Universiti Sains Malaysia, Pulau Pinang, Gelugor 11800, Malaysia. Pharmacy Department, Emirates Health Services, Dubai, UAE. drsabasaleh@hotmail.com

Moyad SHAHWAN*. College of Pharmacy and Health Sciences, Center of Medical and Bio-allied Health Sciences Research, Ajman University, Ajman, 346, UAE. m.shahwan@ajman.ac.ae

Maimona JAIROUN. College of Pharmacy and Health Sciences, Ajman University, Ajman, 346, UAE. bueaty_moon@hotmail.com

Amanj KURDI. Strathclyde Institute of Pharmacy and Biomedical Science (SIPBS), University of Strathclyde, Glasgow, UK. Department of Pharmacology and Toxicology, College of Pharmacy, Hawler Medical University, Erbil, Kurdistan Region Government, Iraq. Center of Research and strategic studies, Lebanese French University, Erbil, Kurdistan Region Government, Iraq. Division of Public Health Pharmacy and Management, School of Pharmacy, Sefako Makgatho Health Sciences University, Pretoria, South Africa. Amanj.Baker@strath.ac.uk

Brian GODMAN. Strathclyde Institute of Pharmacy and Biomedical Science (SIPBS), University of Strathclyde,

Glasgow, UK. Division of Public Health Pharmacy and Management, School of Pharmacy, Sefako Makgatho Health Sciences University, Pretoria, South Africa. Centre of Medical and Bio allied Health Sciences Research, Ajman University, United Arab Emirates. Brian.Godman@strath.ac.uk,

INTRODUCTION

The optimal management of pain in children is an increasing concern across countries since current pain management in children is often suboptimal and inconsistent across countries.¹⁻⁵ This is a growing issue as poorly managed pain, including chronic pain, in children can result in negative behavioral and physiological consequences later in their life.^{1,6,7} In addition, negatively impacting generally on their physical, emotional and social functioning,⁸⁻¹⁰ which can potentially result in a long-term risk of suicidality.¹¹ The psychosocial aspects of pain among children, which includes emotions such as anxiety, depression, fear and stress, can also be more unpleasant than the painful experience itself.^{1,10,12} Chronic pain can also result in short-term consequences, which includes prolonging hospitalization and poor quality of life.^{5,13}

The care of children with pain is not helped by the fact that their pain appears to be multi-dimensional, which includes both physical and psychological dimensions. As a result, pain management may well require a multi-modal approach to care depending on the situation.^{7,14,15} Alongside this,



pain experiences can be influenced by children's previous experiences and expectations with pain as well as sociocultural factors.⁷ In addition children, especially young children, may not be able to always fully verbalize their pain.^{15,16} Consequently, pain in children needs careful management, with the child, their parents, and healthcare professionals (HCPs) playing an important role in helping to successfully manage their pain experiences.^{7,17}

Overall, approximately 20% and 35% of children worldwide are estimated to have chronic pain, with approximately 5% to 8% of children worldwide moderately to severely disabled by their chronic pain.^{8,14,18} As a result, the economic costs of managing children with chronic pain can be considerable. Slead *et al.* (2005) estimated these costs at GB£3.84 billion per year in the United Kingdom in the early 2000s, with Groenewald *et al.* (2014) estimating these at US\$19.8 billion annually in the USA and rising.^{19,21}

In view of its multi-dimensional components, the management of pain in children includes physical, pharmacological and psychological therapies.^{3,17,18} Pharmacological treatments include non-opioids, including topical non-steroidal anti-inflammatory creams, as well as opioids.^{4,22} The use of psychological therapies followed by pharmacological treatments currently have the greatest evidence base.^{8,17}

Community pharmacists are increasingly seen across countries as the first point of contact for patients seeking healthcare, with this situation enhanced by their role in the recent COVID-19 pandemic.²³⁻²⁷ Pain appears to be one of the commonest reasons for patients seeking the services of community pharmacists,^{5,28} with analgesics accounting for the largest category of over-the-counter (OTC) medicines dispensed globally.²⁹ As a result, community pharmacists play an important part in managing patients with pain in the community, including pediatric pain, with both advice, suggestions for management as well as medication reviews.^{5,28,30-32} However, there can be gaps in their knowledge, which may adversely impact on patient outcomes.²⁸ This is because concerns with inappropriate use of pain medications, including OTC pain medications, cannot be underestimated.²⁹

In view of their important role, we wanted to assess the knowledge, attitudes and practices (KAP) of community pharmacists regarding the management of pain in children in UAE, and the subsequent implications. This is because pediatric pain is a common condition in the UAE healthcare context, which can have significant health, clinical and economic consequences if not properly assessed and managed promptly and appropriately. Advice on how to manage pediatric pain is often first sought at pharmacies, with community pharmacists playing a crucial role in this area in the UAE. Consequently, we believed this study was important as we are unaware of any such studies previously undertaken in UAE. Therefore, the aim of this study was to assess the perceptions of UAE community pharmacists towards pain management in children, focusing on their KAP in this field.

METHODS AND MATERIALS

Study design and setting

A cross sectional study was conducted. Four pharmacy students in their final year conducted a survey of professionals working in community pharmacies in Abu Dhabi, Dubai and the Northern Emirates from May 2021 to January 2022. Before the face-to-face interviews commenced, the students performing the interviews were thoroughly trained in the use of the questionnaire as well as the study's scientific terminology. This was because our previous experience showed that comprehensive training enhanced the skills of the interviewers and reduced the number of errors that occurred during the survey.

Research instrument development including pilot testing

A structured questionnaire was initially developed based on a review of the literature.^{5,33-35} This was subsequently modified to fit the context of UAE while ensuring that key research points were covered.

To make sure that the questionnaire's design and relevance to this research project were sufficient, experts in the field of pediatric pain management were asked to give their opinions. In addition, five members of Ajman University's Faculty of Medicine and Clinical Pharmacy were asked to assess the questionnaire for the appropriateness and relevance of its content. Based on the recommendations provided by the experts, slight modifications were made to the questionnaire before pilot testing. Suggested modifications included defining the scientific terminology, modifying the numbering of the questions and pages, replacing the field name (Sex) by (Gender) throughout the questionnaire, linking some questions to each other, and ending the questionnaire at a certain point.

To ensure that the content validity of the questionnaire was acceptable before pilot testing, Lawshe's content validity was employed.³⁶ According to this method,³⁶ any item with a content validity ratio (CVR) above 0.78 is seen as acceptable and any items that are below this threshold are discarded. In this questionnaire, all the items had a CVR above 0.78, indicating that they have acceptable validity. The means of the items with acceptable values for CVR were subsequently used to calculate the content validity index (CVI) of the final research instrument. With a CVI value of 0.879, the final questionnaire in this study was deemed to have overall acceptable validity.³⁷

Pilot testing was subsequently undertaken to assess the face validity of the questionnaire between 7 May 2021 and 22 May 2021. Sixty community pharmacists conveniently sampled participated in the pilot study, and their data were not included in the final analysis. Of these, 45 were able to complete the questionnaire successfully. The pilot study results were subsequently utilized to assess the questionnaire's reliability and to estimate the size of the main research sample needed for the principal study.

We evaluated the reliability of the questionnaire using Cronbach's α ; the resulting Cronbach's α of 0.76 shows that there is acceptable internal consistency.



Research instrument sections

The study questionnaire comprised two parts:

Part 1 – 7 questions that asked for the respondents' demographic information, including their gender, their position as a pharmacist, i.e. either a Chief Pharmacist or Pharmacist in charge, their professional experience in years, and the university from which they had received their degree.

Part 2 – 24 questions that sought to evaluate the respondents' attitudes, knowledge and practices regarding the management of pediatric pain. There was a particular emphasis on knowledge following the initial stages

Questionnaire scoring

The items assessing the respondents' knowledge and attitudes towards pediatric pain management encompassed 4 domains of pain, namely pain management, pain's multidimensionality, pain assessment and measurement, and clinical conditions/pain syndromes. The items assessing respondents' practices referred to issues such as the extent of pain encountered in practice including the perceived cause and location of the pain, the referral of painful conditions and what triggered the referral, experience of training in pain management, how many training sessions had been attended and from which institution they had been given, and potential interest in receiving training in the future regardless of previous training experience.

Categorical responses (i.e., Yes, No, Do Not Know) were used to evaluate 11 of the 24 items in the second part of the questionnaire referring to knowledge and attitudes. The responses were assumed to indicate the respondents' knowledge of the topic and were consequently put into 'correct' or 'incorrect' categories. Correct answers each scored 1 point and incorrect answers each scored 0 points. For the remaining 13 items, which were multiple-choice questions, the responses were placed in categories of correct or incorrect practices. Correct answers each scored 1 point and incorrect answers each scored 0 points. The points scored for all 24 items were subsequently summed to produce the raw correct/incorrect answer scores for each respondent. Following this, the percentage of correct/incorrect responses was estimated for each respondent, giving a range between 0 and 100%, representing the community pharmacists' general attitudes, knowledge, and practices concerning pediatric pain management.

Sample size calculation and target population

The pilot study was employed to estimate the sample size for the principal study. The overall response rate in the pilot study was 75%. The following question was used to estimate the final sample size: "Do you have previous experience of pediatric pain management?" Approximately 60% of respondents answered this question with the affirmative.

In this study, the alpha level was 5%, providing a confidence interval (CI) of 95%. Meanwhile, the precision (D) was set to 5%, meaning a maximum width for the 95% CI of 10%. Based on these assumptions, and assuming a non-response rate of around 60%, a sample size of 922 respondents was considered adequate.

The study sample for the principal study was selected using the following criteria: community pharmacists either working in independent pharmacies or as part of chains registered with the relevant regulatory bodies, i.e., the Ministry of Health, the Health Authority Abu Dhabi (HAAD), or the Dubai Health Authority, and who had a professional experience of at least three months. The exclusion criteria included not being registered with any of the above authorities or having professional experience of less than three months, that is, being recently qualified or still in the probation period.

Sampling technique

Stratified random sampling was used to make sure that the study was representative. A survey in 2010 indicated that 2000 community pharmacies were professionally active in the UAE.³⁸ In the regions selected for the study, we extracted the contact details of community pharmacies, including their location, from the Yellow Pages and local business directories.

We stratified the sample by dividing the community pharmacies that were currently active throughout the UAE into strata or groups according to their location. Three strata were determined as a result, namely community pharmacies in Dubai, community pharmacies in Abu Dhabi, and community pharmacies in the Northern Emirates.

Following the selection of the community pharmacies, all the relevant data including the pharmacy's name, location, type, phone number, and email address, were entered into an Excel spreadsheet that functioned as a sampling frame. A unique ID number was assigned to each pharmacy. Subsequently, a simple random sample selection was performed on the listed pharmacies to select 922 community pharmacies. The selected community pharmacies were subsequently sorted by their location and type.

Data collection

The researchers visited the selected community pharmacies in Abu Dhabi, Dubai and the Northern Emirates between 10 June 2021 and 15 January 2022. The pharmacists were informed of the research purpose and were asked to provide their email addresses. Finally, the trained researchers performed face-to-face interviews based on the structured questionnaire.

Statistical analysis

The collected data were analyzed using SPSS Version 24. The categorical quantitative variables were summarized as frequencies (given in percentages), and the continuous normally distributed quantitative variables were summarized as a mean \pm standard deviation (\pm SD). The continuous skewed data were summarized using median and IQR. The differences between the quantitative variables for the groups were assessed using unpaired student t-tests, one-way ANOVA, and non-parametric variants, as appropriate.

The factors affecting respondents' attitudes, knowledge and practices regarding pediatric pain management were determined using multivariate linear regression models. The stepwise technique was used to select the variables and build the model. Statistical significance was assumed for p-values below 0.05.



Ethical considerations

This study received approval from the Institutional Ethical Review Committee of Ajman University (P-H-S-2021-2-22). The respondents were informed of the study purpose before their data were collected, and they were made to understand that the questionnaire would only be completed and submitted with their full consent. All participants gave their written informed consent. The study did not record the identities of the participants and their confidentiality was safeguarded.

RESULTS

Table 1 presents the demographic information. A total of 867 respondents participated in the study and completed the whole questionnaire. This gave a response rate of 94% (867/922).

The average age of respondents was 31± 6.5 SD. Of the total, 37% (n=324) were male and 63% (n=552) were female. Among the study participants, 472 pharmacists (53.9%) were from independent pharmacies and 404 (46.1%) were from chain pharmacies.

More than half of the participants (68.9%, 604) had more than 10 years of experience. Among the participants, 44.3% (n=388) graduated from local universities and 55.7% (n=488) graduated from regional/international universities. Most of the pharmacists in the study were bachelor degree education holders. Chief pharmacists constituted 36.5% of the study sample and 63.5% were pharmacists in charge.

Table 1. Number and percentage of the questions on demographics (n=867)

Demographic	Groups	Frequency	Percentage
Age	Mean (± SD)	31 (± 6.5)	
Gender	Male	324	37%
	Female	552	63%
Pharmacy type	Independent pharmacy	472	53.9%
	Chain pharmacy	404	46.1%
Experience years	1-10 years	272	31.1%
	More than 10 years	604	68.9%
University of graduation	Local	388	44.3%
	Regional/international	488	55.7%
Education	Bachelor	740	84.5%
	Postgraduate	136	15.5%
Position	Chief pharmacist	320	36.5%
	Pharmacist in charge	556	63.5%

Knowledge, attitude and practice (KAP) of community pharmacists about Pediatric Pain Management

The KAP score was 70% with a 95% confidence interval (CI) [69.9%, 71.7%]. Table 2 shows the results of each question relating to their KAP regarding pediatric pain management.

Table 3 shows the KAP score according to the demographics of the participating community pharmacists. Among the variables,

Table 2. KAP scores regarding pediatric pain management

knowledge, attitude and practice items	Correct response	Correct answer		Incorrect answer	
		Frequency	Percentage	Frequency	Percentage
1. Pain is considered as one of the vital signs in pediatric patients	Yes	776	88.6	100	11.4
2. Visual analogue scale is a pain intensity rating scale for children with pain	Yes	656	74.9	220	25.1
3. Pain intensity of a child with pain should be rated by the pharmacist	No	808	92.2	68	7.8
4. If the child with pain can be distracted that means he/she does not have a high intensity of pain	No	392	44.7	484	55.3
5. Repeated painful procedures on children increase their pain tolerance	No	764	87.2	112	12.8
6. Children may sleep in spite of being in severe pain	Yes	376	42.9	500	57.1
7. Infants feel less pain than adults in similar situation	No	224	25.6	652	74.4
8. Infants forget painful episodes more quickly than adults	No	388	44.3	488	55.7
9. Children with pain should be encouraged to endure as much pain as possible before resorting to pain relief measures	No	752	85.8	124	14.2
10. Frequent request of analgesic by the child with pain means he/she is already addicted	No	836	95.4	40	4.6
11. A 10-year-old patient with a pain score of 5 can be effectively treated with codeine	No	792	90.4	84	9.6
12. Choice of analgesic recommended should depend on: a. Pain intensity. b. Patient's age. c. Pain duration. d. Pain origin	A	764	87.2	112	12.8
13. WHO analgesic ladder for children does not include: a. Weak opioids. b. Adjuvants. c. Non-opioids. d. Strong opioids.	A	280	32.0	596	68.0
14. All are types of OTC analgesic except: a. Paracetamol. b. Ibuprofen. c. Diclofenac. d. Tramadol	D	708	80.8	168	19.2



15. All are examples of analgesic adjuvants except: a. Carbamazepine. b. Celecoxib. c. Amitriptyline. d. Dexamethasone	B	784	89.5	92	10.5
16. All are mechanisms of action of paracetamol-induced analgesia except: a. COX inhibition at its peroxidase site. b. Serotonin receptor activation. c. NAPQI metabolite activity. d. AM404 metabolite activity.	C	748	85.4	128	14.6
17. The recommended analgesic dose of paracetamol in children \geq 3 months: a. 5mg/kg/wt. b. 7.5mg/kg/wt. c. 10mg/kg/wt. d. 15mg/kg/wt.	D	776	88.6	100	11.4
18. The recommended analgesic dose of paracetamol in children \geq 3 months: a. 5mg/kg/wt. b. 7.5mg/kg/wt. c. 10mg/kg/wt. d. 15mg/kg/wt	D	836	95.4	40	4.6
19. The recommended analgesic dose of ibuprofen in children: a. 2.5mg/kg/wt. b. 5mg/kg/wt. c. 7.5mg/kg/wt. d. 10mg/kg/wt.	D	632	72.1	244	27.9
20. All are preferred for a 13-year old with musculoskeletal pain except: a. Paracetamol. b. Ibuprofen. c. Aspirin. d. Diclofenac	C	504	57.5	372	42.5
21. OTC paracetamol use is contraindicated in children: a. < 3 months old. b. With malnutrition. c. With chicken pox. d. None of the above.	D	580	66.2	296	33.8
22. OTC paracetamol use is contraindicated in children: a. Dehydration. b. Asthma. c. Pneumonia. d. None of the above	D	588	67.1	288	32.9
23. OTC ibuprofen use is contraindicated in children: a. < 3 months old. b. With chicken pox. c. Dehydration. d. Pneumonia. e. All of the above	D	580	66.2	296	33.8
24. All are non-pharmacological approaches to pediatric pain management except: a. Physical therapy. b. Hypnosis. c. Music therapy. d. None of the above	D	720	82.2	156	17.8

gender ($P < 0.001$), pharmacy type ($P < 0.001$), experience in years ($P < 0.001$), university of graduation ($P < 0.001$), educational level ($P = 0.002$), and position ($P < 0.001$) were statistically significantly associated with their KAP concerning the management of children with pain. Accordingly, female pharmacists, pharmacists from chain pharmacies, pharmacists with more than 10 years' experience, pharmacists graduated from Regional/international universities, postgraduate education holders and pharmacists in charge were more likely to score higher in their KAP concerning pediatric pain management.

To select the set of factors that jointly influenced KAP on pediatric pain management, we used a stepwise procedure applied to the multivariate linear regression model. Accordingly, a higher KAP score were observed in female pharmacists ($\beta = 0.714$, $P < 0.001$), pharmacists from chain pharmacies ($\beta = 0.812$, $P < 0.001$), pharmacists graduated from Regional/international universities ($\beta = 1.915$, $P < 0.001$), postgraduate education holders ($\beta = 0.910$, $P < 0.001$), being the pharmacist in charge ($\beta = 2.087$, $P < 0.001$) and being older ($\beta = 0.039$, $P = 0.006$) (Table 4).

DISCUSSION

We believe this is the first study conducted among community pharmacists in UAE that explores their KAP regarding the management of pain in children, which is becoming of increasing concern.^{1,7,17} The research identified a number of encouraging areas; however, also areas of concern.

Encouragingly, knowledge areas among surveyed community pharmacists include the fact that pain is one of the vital signs in children (88.6% of pharmacists) and that the intensity of a pain should be rated by a pharmacist before discussing treatment options (92.2% of pharmacists). This is in line with

Demographic Variables	KAP score			P-value
	Mean \pm SD	Median		
Gender				
Male	16.48	3.2	17	< 0.001
Female	17.29	3.1	18	
Pharmacy type				
Independent pharmacy	16.47	3.1	17	< 0.001
Chain pharmacy	17.60	3.1	18	
Experience years				
1-10 years	16.38	3	16	< 0.001
More than 10 years	17.27	3.2	19	
University of graduation				
Local	15.65	3.3	16	< 0.001
Regional/international	18.06	2.6	18	
Education				
Bachelor	16.84	3.1	17	0.002
Postgraduate	17.79	3.5	19	
Position				
Chief pharmacist	15.42	3.3	16	< 0.001
Pharmacist in charge	17.89	2.7	18	

Notes: P-values less than 0.05 were considered statistically significant; P-values obtained from the Kruskal Wallis and Mann Whitney U tests. KAP: knowledge, attitude, practice.

current recommendations for managing pain relief among patients and is welcomed.^{39,40} Confirmation that the choice of treatment should depend on issues including intensity and duration (87.2% of pharmacists) is also welcomed.^{15,16} This is because well managed pain in children leads to faster recovery



Table 4. Univariate and multivariate regression analysis for the factors affecting the KAP about pediatric pain management

Factors	KAP score							
	Univariate				Multivariate			
	B	95% CI	P-value	B	95% CI	P-value		
Gender (Ref. Male)								
Female	0.816	0.379	1.252	< 0.001	0.714	0.333	1.095	< 0.001
Pharmacy type (Ref. independent pharmacy)								
Chain pharmacy	1.129	0.710	1.549	< 0.001	0.812	0.442	1.182	< 0.001
Experience years (Ref. 1-10 years)								
More than 10 years	0.889	0.434	1.344	< 0.001	-----	-----	-----	-----
Graduation (Ref. Local university)								
Regional/international	2.398	2.001	2.794	< 0.001	1.915	1.704	2.469	< 0.001
Education (Ref. Bachelor)								
Postgraduate	0.945	0.363	1.528	0.002	0.910	0.408	1.411	< 0.001
Position (Ref. Chief pharmacist)								
Pharmacist in charge	2.474	2.065	2.883	< 0.001	2.087	1.704	2.469	< 0.001
Age	0.063	0.030	0.095	< 0.001	0.039	0.011	0.067	0.006

Notes: P-values less than 0.05 were considered statistically significant, “---”not included in the multivariate logistic regression model

Abbreviations: B: Un-standardized Coefficients; CI: confidence interval, KAP: knowledge, attitude, practice.

and lower costs.^{16,41} In addition, children should be encouraged to endure as much pain as possible before resorting to pain relief medications due to concerns with opioids if pain is not controlled with non-pharmacological and non-opioid approaches (85.8% of pharmacists).¹⁶ This is because frequent requests for analgesics among children could mean that they are already addicted (95.4%) with concerns with the safety and efficacy of codeine in children as well as morphine intoxication unless well titrated.^{16,42,43} Pharmacists also typically knew the dose of paracetamol broken down by their age (88.6% to 95.4% of pharmacists). This is important with potential toxicities increasing with increased dosing,⁴⁴ although less sure regarding ibuprofen (72.1%). However, both appear to have similar tolerability profiles with severe toxicity rare with both.⁴⁵ Encouraging as well, there was good knowledge about potential non-pharmacological approaches to pain management (82.2% of pharmacists) as these should be tried first or as an adjunct to pharmacological approaches.^{16,46,47}

However, areas of concern included knowledge regarding whether children feel less pain than adults in a similar situation (25.6% of pharmacists).¹⁶ There have also been concerns that the opposite may be true.⁴⁸ In their comprehensive systematic review though, Rabbitts et al (2017) found that there were similar rates of pain post surgery in both adults and children.⁴⁸ However, post operative pain in children can last for more than three months in an appreciable number of children.⁴⁸ In addition in their study with topical diclofenac, Jones et al (2022) found that the analgesic response was greater in children aged 6 to 11 years compared to those aged 12 to 16 years, with both significantly better than adults.²² The contents of the WHO analgesic ladder are important in helping to guide effective pain management in children.^{16,49,50} Consequently, the low number of respondents (32.0%) who were aware of the WHO ladder

is a concern that needs addressing for the future. Another concern was the misconception that children may sleep in spite of severe pain (42.9%). Studies have shown that 74% of children with chronic pain in a recent study reported concerns with sleeping, and that poor quality of sleep was associated with increasing pain and disability.⁵¹ There are also concerns with the concept that if a child with pain can be distracted this means they do not have a high intensity of pain since there are a number of moderators at work influencing their pain.⁵² This also needs addressing going forward with 44.7% of respondents believing this statement to be true (Table 2).

However encouragingly, the scores among participating pharmacists in UAE appeared higher than seen among community pharmacists in Nigeria. In Nigeria, there were serious concerns regarding knowledge of the dose of paracetamol in children (correct among only 9.5 – 9.7% of participants), the mechanism of action of paracetamol (only 9.9% correct), contents of the WHO analgesic ladder (only 13.5% correct) and children may sleep in spite of severe pain (only 24.8% correct).⁵

Greater knowledge was seen among female and older pharmacists, those from chain pharmacies and in charge as well as those graduated from regional/ international universities as well as postgraduate pharmacists (Table 4). A similar situation was seen in Nigeria where knowledge of pain management among children varied significantly by age and the ownership structure of pharmacies. In addition, whether holding a clinically relevant secondary degree or not.⁵

Ideally in the future, pediatric pain consultations should center on the child and be developed using a shared decision-making process involve both pharmacological and nonpharmacological approaches. Pharmacists should also offer advice on which



therapeutic strategies are most suitable for their pediatric patients based on increased knowledge. Beyond the provision of information, education, and advice, the pharmacists' role can expand to provide support for children's behavioral changes as well as referring them to relevant HCPs for additional care.

In addition, in light of their important role, it is imperative for community pharmacists' knowledge of pediatric pain management undergoes regular auditing given the concerns identified in this study. The aim is to identify additional knowledge gaps that may be present, and subsequently develop and implement suitable interventions that can enhance service delivery effectiveness. This has already started in UAE with initiatives to improve knowledge of the WHO analgesic ladder as well as issues of sleep with severe pain. We will continue to build on this.

We are aware of a number of limitations with our study. Firstly, since this was cross-sectional research, the findings from the regression models cannot inform on the causality of the findings. Consequently, it may not be possible to generalize these findings over time. More longitudinal research is required on this topic. Secondly, the survey responses were primarily self-reported and there may be social desirability and recall biases in the results. Despite these limitations, we believe the findings are robust in view of the appreciable number of community pharmacists taking part and the high response rate seen.

CONCLUSION

The results of this study indicate that community pharmacists may lack all the necessary practice knowledge and skills to appropriately manage the children with pain. Implementing effective and targeted educational programs as well as developing specific guidelines that assist community pharmacists in providing appropriate counselling of the children with pain are highly recommended.

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AUTHORS' CONTRIBUTIONS

AAJ and SSA conceptualized the project. MS and MJ contributed in the methodology development, MS and SSA contributed to data collection. AAJ contributed to data analysis and interpretation. AK and BG investigation and write the discussion. The final manuscript has been developed, written, and agreed by all authors. All Authors read and approved the final manuscript.

AVAILABILITY OF DATA AND MATERIALS

All data will be provided upon request.

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

This study received approval from the Institutional Ethical Review Committee of Ajman University. The respondents were informed of the study purpose before their data were collected, and they were made to understand that the questionnaire would only be completed and submitted with their full consent. All participants gave their written informed consent. The study did not record the identities of the participants and their confidentiality was safeguarded.

CONSENT FOR PUBLICATION

All authors are agreed for publication of this manuscript in *Pharmacy Practice Journal*.

COMPETING INTERESTS

All authors declare that they have no conflicts of interest.

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