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Associations Between Safety Results and Critical Care Services Among Paediatric Nurses in Odisha

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***Abstract*: Medication errors are a great concern to health care organisations as they are costly and pose a significant risk to patients. Medication errors to be prescribing, preparation and dispensing, administration or monitoring are key patient safety concerns and a quality measure of healthcare medication process management. When they occur, medication errors produce a variety of problems for patients, ranging from minor discomfort to substantial morbidity that may lead to increased length of hospital stay or death under certain circumstances. The paediatric and neonatal patient population are three times more likely to be affected by medication errors than adults and significantly higher error rates have been reported during prescribing and administration in comparison to dispensing and monitoring.**

***Keywords*: Medication, paediatrics, administration, patient safety, management.**

1. Introduction

Parents of children scheduled for surgery often experience emotional distress and anxiety. The wait while the child is in surgery can be distressing for parents and concerns about potential complications, surgical outcomes, anesthesia-related side effects, and postoperative care are reported [1]. Parental needs for information and support vary during the period from the day of surgery to the time after discharge. Surgical treatment aiming to normalize the head shape and avoid a raised intracranial pressure is often performed during the child's first year of life. Care can be optimized by being organized around an interdisciplinary team [2]. There are previous descriptions of parental stress in connection to an infant's initial diagnosis of craniosynostosis. Parents have described worries about surgery and concerns about the infant's long-term prognosis. After surgical treatment, parents of children with craniosynostosis mostly report high satisfaction with the interdisciplinary craniofacial care provided. It is evident that parents of children scheduled for craniofacial surgery have worries and can experience emotional distress, like any parents with a child who must undergo surgery [3], [4]. To further develop evidence-based care, it is crucial to have more knowledge of parents' perspectives and their experiences of care during the whole process, including the time at home after discharge from the hospital. Qualitative research methods are particularly useful to answer questions about the individual's experiences. Integration of these methods into craniofacial research can ensure that patient and family perspectives are considered when developing practice and policy in craniofacial care [5]. The hospital staff was perceived as kind, helpful, and understanding, as well as confident and professional. Cooperation with the staff worked well, and the parents felt secure in that the staff was competent and reliable [6]. The simplicity of just ringing a bell to get attention was appreciated and created a feeling of security. Parents were offered help even with things they had not realized they needed help with. The staff offered support and advice at all times. They were left with a feeling of being alone and on their own. Some suggested that they would probably have received more help if they had asked for it, but that it felt hard to ask [7]. The hospitalization was an intense experience and the feeling of insecurity and abandonment was sometimes increased by practical issues, such as being obliged to change rooms in the pediatric ward. Others found that the time at the ICU was the hardest. The child woke up and cried after surgery, making the parents feel alone and insecure [8,9]. They would have wanted someone to be there, to help them with the medical equipment that sometimes made it difficult to hold and care for the child.

2. Material and Methods

Some electronic databases were searched. British Nursing Index (BNI), Cochrane Database of Systematic Reviews, Cumulative Index to Nursing and Allied Health Literature (CINAHL), EMBASE and MEDLINE. To maximize search sensitivity, a combination of various free text key words and Medical Subject Headings were used. The review considered peer reviewed published studies involved in implementation of an intervention aimed at reducing medication administration errors among nurses in in-patient paediatric clinical settings. Children were defined as individuals between 0 and 18 years of age. Papers published in other languages were considered if an English translation was available [10]. Excluded studies included case studies, epidemiological studies, reviews, editorials and opinion papers. The quality Assessment Tool for Before and After (Pre-Post) studies with No Control Group (BAQA) was used to assess the risk of bias of included studies. Interview methods also applied in some cases for data collection [11].

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3. Results

Table 1
Univariate analysis of participants characteristics and nurse confidence on peripheral intravenous catheter insertion and maintenance (N:413)

		Nurse Insertion Confidence		Nurse Maintenance Confidence	
Variable	**n**	**95% CI**	**p-value**	**95% CI**	**p-value**
Sex			0.127		0.049
Male	19	-0.49 – 3.92		0.01 – 3.96	
Female*	394	-		-	
Age			<0.001		<0.001
20-29y	108	0.64 – 2.79		-2.53 – 0.35	
30-39y	154	-1.17 – 1.84		-0.85 – 1.89	
40-49y	103	-0.53 – 2.82		-0.08 – 2.82	
50-59y*	48	-		-	
Work Area			0.529		0.582
Neonatal ward	103	-3.48 – 0.33		-2.60 – 0.82	
Paediatric ward	163	-3.32 – 0.32		-2.07 – 1.21	
Mix Paediatric & Neonatal ward	39	-3.17 – 1.31		-1.73 – 2.31	
Neonatal Intensive Care Unit (NICU)	44	-2.90 – 1.47		-2.87 – 1.06	
Paediatric Intensive Care Unit (PICU) or Mix NICU & PICU	32	-3.10 – 1.60		-1.91 – 2.30	
Other*	32	-		-	
Education			0.083		0.543
Diploma	323	-0.13 – 2.11		-0.70 – 1.32	
Bachelor or Master*	90	-		-	
Insertion Training			<0.006		
Yes	302	0.43 – 2.50			
No*	111				
Maintenance Training					<0.001
Yes				1.35 – 3.27	
No*				-	
Work Experience (Years)	413	0.25 – 0.36	<0.001		<0.001
Nurse Insertion Knowledge	-	0.49 – 0.75	<0.001		
Nurse Maintenance Knowledge	-		-	0.59 – 0.99	<0.001
*Note: *Referent group, CI: Confidence Interval*					

Table 2
Summary of peripheral intravenous catheter insertion and maintenance topics asked in the questionnaire and area where nurses responses are still suboptimal

Knowledge		Confidence	
Insertion	Maintenance	Insertion	Maintenance
Need assessment of PIVC placement	*Risk factors of PIVC complications*	*Insert PIVC within 1 or 2 attempts*	Patient education related to PIVC insertion and care
General guideline for catheter size selection for routine venous access	*Dressing methods*	Select most appropriate catheter for the prescribed treatment plan	*Perform routine PIVC site assessment*
Catheter selection for specific/prescribed treatment plan	Stabilization methods	*Assist peers with difficult IV starts*	*Document the results of site assessment*
Vein selections	Time interval for PIVC assessment for non-irritant IV treatment	Select an ideal vein for peripheral iv access	*Recognise signs and symptoms of PIVC complications*
PIVC insertion procedures	Time interval to change PIVC dressing	Prepare the insertion site	*Deal/treat the PIVC complications*
Health education prior to PIVC insertion	*Time interval to change the IV set for blood transfusion*	*Insert the catheter correctly*	Perform catheter site care
Vein dilation techniques	*Time interval to change PIVC insertion site*	Advance the catheter correctly	*Flush or lock the catheter*
Pain management selection	*Flushing & locking PIVC*	Remove the needle/stylet with minimal blood exposure	*When to remove or rotate the catheter*
Pain management administration	*Types of PICV complications*	Dress and secure the iv catheter	*Document accurately the removal of the catheter*
Do no harm/Insertion referral to more experienced inserters	*Treatment for PIVC complication: phlebitis*	Document iv insertion	
Insertion documentation	Treatment for PIVC complication: infiltration		
	Documentation after PIVC removal		
Note: Sentences in Italic indicate area of deficit			

Table 3
Univariate analysis of participants characteristics and nurse knowledge on peripheral intravenous catheter insertion and maintenance

		Nurse Insertion Knowledge		Nurse Maintenance Knowledge	
Variable	**n**	**95% CI**	**p-value**	**95% CI**	**p-value**
Sex			0.727		0.673
Male	19	-1.24 – 1.77		-0.71 – 1.10	
Female*	394	-		-	
Age			0.109		0.221
20-29y	108	-1.76 – 0.46		-1.07 – 0.27	
30-39y	154	-0.80 – 1.31		-1.16 – 0.11	
40-49y	103	-0.83 – 1.40		-0.77 – 0.57	
50-59y*	48	-		-	
Work Area			0.714		0.287
Neonatal ward	103	-1.82 – 0.78		-0.92 – 0.64	
Paediatric ward	163	-1.07 – 1.41		-0.48 – 1.01	
Mix Paediatric & Neonatal ward	39	-1.49 – 1.57		-0.51 – 1.33	
Neonatal Intensive Care Unit (NICU)	44	-1.49 – 1.49		-0.88 – 0.91	
Paediatric Intensive Care Unit (PICU) or Mix NICU & PICU	32	-1.57 – 1.64		-0.28 – 1.65	
Other*	32	-		-	
Education			0.315		0.329
Diploma	323	-0.37 – 1.15		-0.23 – 0.69	
Bachelor or Master*	90	-		-	
Insertion Training			<0.001		
Yes	302	1.52 - 2.88			
No*	111	-		-	
Maintenance Training					<0.001
Yes				2.16 – 2.92	
No*				-	
Work Experience (Years)	413	0.17 – 0.25	<0.001	0.06 – 0.12	<0.001
Nurse Insertion Knowledge	-		-		-
Nurse Maintenance Knowledge	-		-		-
*Note: *Referent group, CI: Confidence Interval*					

4. Discussion

The purpose of the used method was to expand the nurses' descriptions of their experiences regarding pain assessment and its methods by using a reality-based case. The results from the present study provided an up-to date insight into nurses' assessment of pain in children [12]. Nurses in this study self-reported their own perception of having theoretical knowledge about pain assessment of children in pain. In the present study, self-reported experiences varied between surgical and medical contexts [13], [14]. A perception seems to exist those routines and guideline are clearer within the surgical context, something which is seen as promotive of nurses' work, compared to the medical context. Different pain scales are also said to constitute a possible difficulty, as there is, according to nurses in this study, a lack of recommendations for a unified use of pain assessment scales [15]. These problems have already been highlighted in different contexts, which confirms our results.

5. Conclusion

Administration of medicines to children via any route can sometime be a complex process requiring special attention and multifaceted interventions to reduce and or avoid potential errors. There is no ‘one size fit all’ solution in reducing medication administration errors [16], [17]. Identifying causes of errors within the local context and understanding conditions and mechanisms that exacerbate such practice performances is necessary in designing or choosing potential effective interventions from the list outlined in this research. Continuous monitoring and evaluation of interventions used in clinical practice is paramount for measuring effectiveness and ensuring patient safety [18].

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