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RESEARCH ARTICLES

Barlow, Ortolani and hippy dolls: Understanding child health nurses practice when screening for developmental dysplasia of the hip

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ABSTRACT

Objective: To identify Child Health Nurses, Registered Midwives, Registered Nurses, or General Practice Nurses' individual practices, understand their practice and any enablers or barriers to their practice when screening for developmental dysplasia of the hip (DDH) in infants.

Methods: Online focus groups were held via Zoom. The focus groups were semi-structured and utilised a pre-developed guide to ensure the research aims and objectives were covered. The three focus groups were recorded transcribed, and data from the 11 participants analysed using a structured thematic analysis.

Results: Four themes were found to be important to practice when screening for DDH. Theoretical education and practical training of clinicians was viewed as essential and included consistency of training and ongoing education. Participants highlighted perceptions of practice and confidence in their own and others practice. Understanding screening, diagnosis and treatment was important, as was the role of other health care providers and best practice recommendations. Finally supporting families and the child was seen as an essential role especially during missed diagnoses.

Conclusion: Barriers to confidently screening for DDH are many, with enablers few. Child Health Nurses require ongoing training and education to confidently screen infants for DDH. This training should be evidence based which will require further research into the current education available.
To support an evidence-based approach to screening a study of accuracy should be explored.

Keywords: Child Health, Mass Screening, Nurses,

What is already known about the topic?

- Child health nurses in Australia screen infants for DDH as part of everyday practice.
- There is minimal evidence understanding nurses practice, barriers and enablers to practice, and experiences when screening for DDH.
- There is no recognised formal training for DDH screening.

What this paper adds

- Nurses require ongoing training and education to confidently screen for DDH.
- Training for DDH screening should be evidence based and provided to all clinicians involved in screening for DDH.

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OBJECTIVE

This study focuses on understanding the individual and collective experiences, screening practices, and barriers and enablers of CHNs, Registered Midwife, Registered Nurse, or General Practice Nurses who use physical assessment to screen infants and young children for DDH.

BACKGROUND

Child health nurses (CHNs) in Australia are Registered Nurses who generally hold a postgraduate qualification and specialise in the domain of child and family health nursing.[1] Qualifications and training in child health varies between organisations. CHNs work primarily in community health care settings and provide care to infants, children, their parents, and families.[2] All Australian children can visit CHNs free of charge for support, assessment and education until the child starts school, generally five years old.[2] CHNs possess expertise and skill in specific areas that impact the growing child and family environment.[2]. One specific area of knowledge that plays a large role in their daily practice is understanding and comprehensively assessing child health and development.2 To facilitate this, in all states of Australia, children are provided with a coloured book at birth that outlines Universal Well Child Assessments (UWCA) at pre-identified intervals during the child's first five years of life.[3–9]

The UWCA focuses on measurements and screening tests to monitor children's health and development and identify any problems as early as possible.8 One such screening test involves developmental dysplasia of the hips (DDH). Developmental dysplasia of the hips describes a spectrum of abnormalities where the femoral head and acetabulum are not in alignment, grow abnormally or a combination of both.10 During infancy and early childhood clinicians can use physical assessment to screen for underlying abnormalities in hip anatomy and function that may indicate a low or high suspicion of DDH.[11] The aim of screening for DDH is to detect children with abnormal findings as early as possible to diagnose, treat or monitor appropriately.12 In Australia, CHNs are the primary clinicians for DDH screening in infants and young children.[10] There is no recognised formal training for DDH screening; and currently few studies describing the knowledge, attitudes, practice, and confidence of child health nurses who use physical assessment to screen for DDH.[10]

METHODS

AIM

The aims of this Australian study are to identify clinicians' individual practices, understand their practice and any enablers or barriers to their practice, when screening for DDH in infants.

STUDY DESIGN

This study was exploratory due to a lack of published research on the area. Focus groups allowed the participants to use their own clinical experience and practice and identify topics that were important to them. Participants were then able to discuss and debate any points of interest or concern. Focus groups therefore facilitated discussion of a variety of topics and perspectives over a short period of time.

SAMPLING AND RECRUITMENT

Participants were recruited through various means including authors' pre-existing networks, Australian professional child health nursing bodies, professional networking, and snowballing. To meet the inclusion criteria, clinicians had to identify as a CHNs, Registered Midwife, Registered Nurse, or General Practice Nurse and that screening for DDH is part of their daily practice. All participants provided written informed consent prior to being scheduled to a focus group.

SETTING

Focus groups were held via Zoom and moderated by the first (LS) and third (LP) authors. All sessions were held in the evening and participants joined from either their home environment or child health clinic room. At the beginning of each focus group participants introduced themselves to the moderators, other participants in their group and confirmed they had provided written consent to participate in the research. Participants were asked to activate their cameras to enhance engagement and interaction. Participants received a gratitude payment for their time (AU $50 online gift card).

DATA COLLECTION

Three focus groups were held over a four-week period in May – June 2023, lasting a minimum of 45 minutes and a maximum of 70 minutes. The focus groups were semi-structured and utilised a pre-developed guide to ensure the research aims and objectives were covered. The guide was developed from the results of a literature review,[10] and researchers experience. The focus groups were recorded using Zoom audio recording and transcribed by the first author (LS). Focus groups were ceased when data saturation was reached, this was defined when no new categories were discussed by participants.

ETHICAL CONSIDERATIONS

Ethical approval was obtained from the University of South Australia Human Research Ethics Committee (project number: 205417). All participants provided verbal and written informed consent prior to participation.

DATA ANALYSIS

The data analysis followed Braun & Clarke's six stage framework for thematic analysis,[13] additionally utilising a two-researcher approach for reliability of findings.[14] The focus group recordings were transcribed verbatim by the lead author (LS) to allow for data immersion. The second author (PKO) listened to the recordings while viewing the transcripts. These two researchers then coded the transcripts using NVIVO software.[15] Themes from these codes were identified independently by LS and PKO, with in depth discussions occurring to agree on the final themes and subthemes. The reliability of the findings was further enhanced by deep discussion with all authors, that included different health disciplines and currently practicing clinicians. This triangulation ensured the credibility of the data and reported findings were valid.[16]

TRUSTWORTHINESS

The two researchers (LS & PKO), involved in the analysis of the data both have a nursing background, (PKO) a novice who has not practiced in the field and (LS) who has post graduate qualifications and has practiced extensively in the area. Data collection methods, analysis, and reporting of results in this current study are considered by the authors as truthful and an accurate representation of the population of focus.

RESULTS

PARTICIPANTS CHARACTERISTICS

A total of 11 participants consented to participate in focus groups. All participants identified as female, most participants had been screening for DDH for between 6 – 15 years (72.7%, $n = 8$), and all had post graduate education in the areas of midwifery or child and family health. The characteristics of participants are presented further in Table 1.

Four themes, with 12 sub themes were identified in the data and shown in Figure 1.

Theoretical education and practical training of clinicians	• Consistency of training • Hippy Dolls for training and assessment • Ongoing education and training
Perceptions of practice	• Confidence in their own practice • Confidence in other clinicians • Doubting practice
Understanding screening, diagnosis and treatment	• DDH is a developmental condition • Role of other health care providers • Best practice for screening, diagnosis and treatment
Supporting families and the child	• Best practice for screening, diagnosis and treatment • Emotional impact on families and the clinician • Long term implications if a diagnosis is missed

FIGURE 1: THEMES AND SUB THEMES

TABLE 1: PARTICIPANT CHARACTERISTICS

Characteristics		*N*	%
Age	31-40 years	4	36.4
	41-50 years	2	18.2
	51+ years	5	45.5
	Total	**11**	**100.0**
Position	Child Health Nurse	7	63.6
	Midwife	1	9.1
	Midwife and Child Health Nurse	3	27.3
	Total	**11**	**100.0**
Education	Graduate Certificate	2	18.2
	Graduate Diploma	7	63.6
	Masters	1	9.1
	PhD	1	9.1
	Total	**11**	**100.0**
Experience	6-10 years	5	45.5
	11-15 years	3	27.3
	16-20 years	1	9.1
	21+ years	2	18.2
	Total	**11**	**100.0**

THEORETICAL EDUCATION AND PRACTICAL TRAINING OF CLINICIANS

All participants discussed the consistency of training that they received both formally and as part of their ongoing clinical positions. There was a general perception that the training was inconsistent and did not meet their needs. Participants in all focus groups agreed that while they knew that there were recommended assessments, they were not always taught how to do them:

> *'In terms of training for me… it was super basic it was literally just watching another midwife. What felt like just do an abduction, and just bring it back in and having a feel. There wasn't much, I don't even feel like Barlow and Ortolani were even mentioned, or you know…There was kind of no checking the height, leg lengths, any of those things. It was really very vague.'*

Every focus group spent time discussing the use of the 'hippy doll' during training and assessment. There was discussion about the cost of the doll and how the dolls may not be accurate, however ultimately participants felt they were useful to use when practicing skills:

> *'Those dolls what everyone was saying, were a bit, aren't the best, at least that's better than nothing.'*

Participants also expressed their need for ongoing training and recognising expertise in the area. For instance, some participants said they had spent time with paediatric consultants or physiotherapists to watch and learn from experts in the field. This lack of ongoing training could lead to frustration and a feeling that their own learning was inconsequential as evidenced in the focus groups:

> *'I do think having that expert education for us nurses, I think we're well deserving of that and that should be prioritised ... I did the masters ... and there was nothing in there. You know, like at no point has there ever been any solid education other than the . . . video, and a few nursing assessments along the way. And that's poor effort from my perspective.'*

PERCEPTIONS OF PRACTICE

Most participants stated that they were confident in their own practice and after reflection and discussion began to doubt themselves. Participants discussed that they felt confidence was something that developed over time. There were also factors that altered confidence, including the age and size of the child, staffing levels, the ability to 're-check' the infant and picking up on clinical signs that had less significance than an obvious dislocation or a clunk. One participant explained this well:

> *'But a generally healthy baby, I feel fairly confident. After many, many, years. Like I think it takes a long time in the early stages. I definitely didn't have the same amount of confidence and even to the point of when you're doing your competency 's going 'Oh my gosh am I doing it right' and getting really nervous. But now I feel yeah confident that I'm doing it right after so long.'*

The role of other health professionals and the confidence in others practice was a topic that divided most groups. Participants spoke about the role of the general practitioner, physiotherapist, paediatricians, and other nurses. More than half of the participants stated that they had observed practice in other professionals that concerned them, whilst other participants held certain professionals' assessment skills in high regard:

> *'People actually are just moving legs around, thinking that that's checking hips and not really understanding what they're trying to do when they are moving the hips.'*

All participants talked about self-doubt and the guilt they felt if they 'missed' a DDH during screening. For some participants the doubt was around infants they had referred on for further review and other professionals did not find abnormalities in physical assessment or imaging. For other participants it was doubting their own ability detect signs of DDH. Overwhelmingly, participants agreed that referring the infant to another health professional for review was reassuring:

> *'I guess there's sometimes I do doubt myself if, you know there's perhaps a bit of a family history or somebody else's picked a click up or you know sometimes* people feel their knees and they're like Oh no that's a click. Those type of *situations then I perhaps doubt myself. But yeah, they're usually being referred anyway, so. . .'*

UNDERSTANDING SCREENING, DIAGNOSIS, AND TREATMENT

Developmental dysplasia of the hip as identified in the name is a developmental condition. It may not be present at every assessment, and this was recognised in all focus groups with most participants including this in their discussions:

> *'I think like the other thing we have to remember is... Not to feel guilty necessarily* if we don't pick it up. Because it's called developmental hip dysplasia for a *reason you know? And so I've heard people say why didn't that GP pick it up? Or why didn't that nurse pick it up? And I think about the actual pathophysiology and what that actually it is.'*

Many participants considered the role of the general practitioner in the referral pathway and how they considered this to be inconsistent. Factors contributing to this included geographical locations, years of practice of the general practitioner, and conflicting priorities in appointment times. Some of the participant had found that they had to specifically request additional screening. One nurse confided to the group:

> *'I find that so dependent upon the GP and that whether or not they will actually* go and screen. And quite often we are now starting to write letters to the GP to *say you know we strongly suggest an ultrasound is done. Because sometimes we'll see clients pop back to us at that eight week check and their GPs like no that's fine, baby's fine, I couldn't feel anything. And I've always found that a little bit concerning.'*

Discussion in all group interviews explored best practice and recommendations for prevention, screening, diagnosis, and treatment. Double nappies, ultrasound screening and the length of time immobilisation devices are worn were discussed. All participants agreed that best practice was varied and there was inconsistency between clinicians from different disciplines, and even clinicians in the same discipline. This included discrepancies on when to screen and how to screen. More than one interview identified CHNs as the clinicians who had to advocate for further screening, a diagnosis or treatment. One nurse explained:

> *'What was so awkward with that one was, two paediatric consultants dismissed* it. Our physio kept saying not good enough, it needs to be followed up. This little *one needs to be in a harness. And then in the end it was. . . I felt I was the meat in the middle. . ., I felt like I had to kind of be sneaky and ask her local GP could he refer to kids. . .'*

SUPPORTING FAMILIES AND THE CHILD

Every participant discussed educating parents about what information is currently available, what information is needed, and what they need to do. Participants all agreed that when explaining what DDH is to parents, they use their hands to mime making a 'femoral head' and 'pelvis'. Participants discussed that while some parents will know what DDH is – and this is normally because of a diagnosed family member or friend's child, the majority of parents have not heard of the diagnosis. Clinicians identified that when parents were concerned or wanted more information about DDH, there were minimal non-acute resources available to them:

> *'I tend to use, when explaining it to the parents, I mean explain it's a ball and socket joint a lot like [Participant 7] was explaining and using my hands and things like that. And if there are concerns, I'll often just send them some of them, I'll email them some of the information from the Sydney Children's Hospital or something like that.'*

Clinicians identified the emotional impact that screening, diagnosis, and treatment had on an infant and their family. Whilst all participants alluded to guilt over late diagnoses, they continued to support and check on families and infants affected. One nurse spoke about the first time they saw an infant in a brace, and infants that were diagnosed later in childhood:

> *'So, the other baby that was a late pick up, she was put into a rhino harness at six months and she's coming up to two and she's still in the harness. And for that family unfortunately this little one had other cardiac complications and so on. So, for them it's just been a really long journey and the wear and tear that is had on, on them as new parents and a new family has just been enormous.'*

There was general agreement that the long term implications of missing a diagnosis was a motivator to ensuring all infants were checked routinely. Long term implications for the child including the need surgery, uneven gait, delayed gross motor skills and problems as an adult were discussed:

> *'You know it doesn't seem to be as bigger issue as other, you know other things that you can just as easily miss. But it just seems to have this real stigma about hips and that you're going to miss them. And it's all going to be tragic and they're not going to be found until they're one year old and treatments going to be quite excessive and long and all of this.'*

DISCUSSION

Screening infants for DDH is an important component of infant assessment for CHNs and other health professionals that routinely see infants in clinical practice.[17] A 2015 study highlighted the need for continued education, competency and specialist knowledge for CHNs.[1] Our study also found that to confidently assess infants, CHNs and other health professionals should receive formal, ongoing training and education from leading experts in the field. Bailey and Emory (2022) demonstrated that simulation increases clinician confidence and transfers to improved patient care and clinical performance.[18] The 'hippy dolls' simulation training while seen as a 'better than nothing resource' by the participants in this study, may become a valuable training and assessment tool if the ability to consistently manoeuvre the hips and not permanently dislocate them is improved. The 'hippy dolls' are only suitable when used for training or assessing clinicians in performing the Barlow or Ortolani manoeuvres.[19]

Our study indicated that participants perceived DDH screening to be an important component of infant assessment for both themselves, and other health professionals. CHNs working in this area have an advanced scope of practice.[1] International studies have found that collaborative relationships with other health care professionals is essential to a cohesive healthcare team and establishing models of care.[1,20]

Education and training to support clinical knowledge and skills in the area was identified as being inconsistent and a barrier to clinicians confidently assessing all infants. International studies have determined the accuracy of different professions when screening for DDH, in one study physiotherapists were more effective at screening for DDH than junior paediatric doctors.[21] While a 2021 study found that positive predictive value of DDH screening when performed by general practitioners is low and continuing to decline.[22] CHNs reported much of their knowledge and practice was learnt on the job and refined over many years of practice. The findings of Krikler and Dwyer would support that experience is valuable, however education and training should also be provided to increase overall screening accuracy.[21] In this study while learning from each other was important, there was a real desire to receive formal, consistent education and simulated practice from leading experts in the field. Thus, understanding how experience, education and training influence screening accuracy are key factors in the development and delivery of education and training to provide safe and effective nursing care that is underpinned by evidence.[18,23]

IMPLICATIONS FOR PRACTICE

This study suggests that child health nurses require ongoing training and education to confidently screen infants for DDH. This training should be evidence based which will require further research into the current education available. There is currently no research into the accuracy of child health nurses screening for DDH. Studies that report on accuracy of screening assessments for DDH are predominantly conducted in tertiary settings and determine accuracy of practice for medical practitioners.

To support an evidence-based approach to screening a study of accuracy when child health nurses screen for DDH in the community should be explored. The results of a child health nurse-based accuracy study would provide an evidence base to determine an Australia wide approach to child health nurse education and training when screening for DDH.

LIMITATIONS

There were limitations to this study, particularly it is recognised that these are the experiences and views of more experienced clinicians. Clinicians with less experience did not respond to ongoing requests to participate in the focus groups. The views of less experienced clinicians were therefore not included, and it is acknowledged by the authors that they may vary from these findings. Our results should inform further research and are not necessarily intended to be generalisable. Arguably, the sample size was small, however data saturation was reached.

CONCLUSION

This study identified screening for DDH is an important role for clinicians. Barriers to confidently screening for DDH are many, with continuing and specialist education seen as the most important. The role of the hippy doll was seen as an important training tool, that could be improved to enhance clinical performance and confidence.

Clinicians highlighted the important role they had in not just screening but continued support and advocacy for the family if DDH was diagnosed in the infant.

All clinicians interviewed expressed a desire for ongoing training and professional development. The need for high quality resources not just for clinicians but for families, and consistent national, evidence based, approaches to competencies related to DDH screening for all health professionals.

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