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ORIGINAL RESEARCH: CLINICAL

Perinatal e-screening and clinical decision support: the Maternity Case-finding Help Assessment Tool (MatCHAT)

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ABSTRACT

INTRODUCTION: Screening tools assist primary care clinicians to identify mental health, addiction and family violence problems. Electronic tools have many advantages, but there are none yet available in the perinatal context.

AIM: To assess the acceptability and feasibility of the Maternity Case-finding Help Assessment Tool (MatCHAT), a tool designed to provide e-screening and clinical decision support for depression, anxiety, cigarette smoking, use of alcohol or illicit substances, and family violence among pre- and post-partum women under the care of midwives.

METHODS: A co-design approach and an extensive consultation process was used to tailor a pre-existing electronic case-finding help assessment tool (eCHAT) to a maternity context. Quantitative MatCHAT data and qualitative data from interviews with midwives were analysed following implementation.

RESULTS: Five midwives participated in the study. They reported that MatCHAT was useful and acceptable and among the 20 mothers screened, eight reported substance use, one depression and five anxiety. Interviews highlighted extensive contextual barriers of importance to the implementation of maternity-specific screening.

DISCUSSION: MatCHAT has potential to optimise e-screening and decision support in maternity settings, but in this study, use was impeded by multiple contextual barriers. The information from this study is relevant to policymakers and future researchers when considering how to improve early identification of common mental health, substance use and family violence problems.

KEYWORDS: e-screening; perinatal; mental health; substance use; family; violence; midwifery

Introduction

Improving perinatal mental health has become an international public health issue as the effect of untreated mental illness on women, children and society has become better understood.[1] Mental illness, exposure to alcohol, cigarette use, illicit substances use and intimate partner violence in the perinatal period have wide-ranging and lifelong physical and mental health consequences for offspring.[2] Poorer birth outcomes, worse emotional, behavioural, social, and cognitive development,[3] and increased rates of infant hospitalisation and mortality[4] are well demonstrated. Routine screening is widely recommended to facilitate early identification and access to care.[5] In New Zealand, screening for mental health problems, use of

WHAT GAP THIS FILLS

What is already known: Midwives recognise the importance of mental health, addiction and family violence in the perinatal period, but routine screening is controversial internationally. Electronic screening and technology-based decision support systems show benefit in overcoming barriers to care for these same problems in other age groups and contexts, particularly improving disclosure and detection rates.

What this study adds: Electronic screening for problems in multiple health domains has not previously been studied in the New Zealand perinatal context. Despite adaptation of a well-regarded screening tool with supported decision-making through co-design, as well as provision of stepped-care resources and accessible professional advice, the multiple practical constraints to screening in a community midwifery clinic were not overcome.

cigarettes, alcohol and illicit substances, and family violence is recommended as part of standard maternity care,[6] yet problem identification continues to be *ad hoc* and reliant on the clinical judgement of midwives.[7] Without improved screening tools, increased clinical decision support and mental health training for midwives, current practice will continue to lag behind best practice recommendations.[7]

Routine screening for mental health and psychosocial difficulties is improved by using computerised systems that reduce staff burden, increase time-efficiency and increase participation rates.[8,9] In youth populations, computer-based screening assists in overcoming privacy concerns,[10] but there has been little research into whether an electronic screening approach might be useful in the perinatal period.

This study investigated the implementation of MatCHAT, a maternity version of eCHAT, the electronic Case-finding and Help Assessment Tool,[11] to screen for antenatal and postnatal depression as well as anxiety, substance use and partner violence. The aim of the research was to investigate whether MatCHAT, which also includes decision support and a stepped-care management plan for midwives, might support early detection and appropriate management for the problems identified. We also assess feasibility, utility and acceptability of the intervention.

Methods

Ethical approval was granted by the Northern B Health and Disability Ethics Committee (16/NTB/175). All MatCHAT screening data were stored securely and encryption of the National Health Index unique identifier ensured patient confidentiality.

Study design and development of MatCHAT

The study used co-design and a qualitative approach that included extensive consultation with midwives, physicians and hospital administration to develop MatCHAT and to ensure that appropriate resources, pathways and services were available when problems were identified. Following this process, all stakeholders agreed on items to be included in the MatCHAT package and the MatCHAT piloting procedure. The midwives agreed that screening was important, but supported having fewer modules and truncated versions for some screening items. The finalised MatCHAT included: brief smoking, drinking and other drug use questions; the Patient Health Questionaire-2 (PHQ-2) for depression,[12] with the full Patient Health Questionaire-9 (PHQ-9) triggered when PHQ-2 positive; an anxiety question triggering the General Anxiety Disorder-7 (GAD-7)[13] when positive; and four questions regarding family violence. All questions were mandated by the local District Health Board. Women were asked if they wanted help with any issues identified by a positive response.

Development of resources

A Stepped Care Resource Booklet was developed that included referral instructions and support resources, categorised according to the severity of the symptoms identified for each module. There was advice on how to respond to positive screens, information on psychosocial supports, self-management resources (such as patient handouts, helpline numbers and URLs to self-help sites) and pre-written referral letters for primary and secondary health services and community-based agencies. Midwives were also provided with a brief MatCHAT Users' Guide and advised of contact details for the psychiatrist member of the research

team, to provide phone coaching if additional issues were identified.

Participants and procedures

Participants were community midwives at an Auckland hospital and antenatal and postnatal women in their care. Following the initial MatCHAT consultation processes, midwives were provided with study information and invited to participate. Technical and clinical training in using MatCHAT was provided, as well as a participant information sheet. Midwives ensured that women undertaking an MatCHAT guided interview received an abbreviated participant information sheet with their standard appointment reminder. Prior to using MatCHAT, midwives also viewed an embedded explanatory video in which a young Māori woman explained the tool. Consent by ante- and post-natal women to participate in the study was implicit by proceeding to the MatCHAT screening questions. Midwives invited women to complete MatCHAT and then reviewed the results with them for shared decision-making. Following screening, midwives offered women an opportunity to participate in a follow-up survey regarding their experience using MatCHAT.

Data and analysis

Data collected from the MatCHAT program via a web link included numbers of screens completed, positive cases, participants who wanted help and the level of care recommended, and ratings of acceptability, feasibility and utility from online surveys. Descriptive statistics were calculated for survey data using Microsoft Excel (Microsoft Corporation, Redmond, WA, USA). Semi-structured interviews were conducted face-to-face with participating midwives, recorded and transcribed verbatim. Qualitative data analysis used the general inductive approach by Thomas (2006), in which transcripts are read repeatedly to generate themes based on prevalence and saliency.[14]

Results

Of the 25 eligible midwives approached between July 2017 and February 2018, 10 expressed an initial interest, six agreed to participate and three used MatCHAT. Midwife A completed 14 screens, Midwife B completed two, and Midwife C completed four. Five midwives completed an interview 4 months after completing of the MatCHAT trial period.

All 20 of the women screened were antenatal, and positive screening identified one woman who smoked cigarettes, seven drinking alcohol, one with depression and wanting help, and five with anxiety, two of whom wanted help. None indicated drug use or exposure to family violence. No participants completed the online survey.

Three main themes emerged from qualitative analysis of the midwife interviews, relating to the MatCHAT prototype, midwives' knowledge and barriers to implementation.

The MatCHAT prototype

Midwives spoke in depth about the physical qualities of the MatCHAT tool, specifically its aesthetics, composite design, technology and the language that facilitates its functioning. Participating midwives, including midwives who did not use MatCHAT, were largely positive about the tool's aesthetics and found it easy to navigate, well laid out and visually pleasing. There were minimal suggestions about how these aspects of MatCHAT could be improved. One midwife expressed a preference for a bigger font and stated that she found it difficult to click on certain functionalities within the tool.

Midwives liked the composite design of MatCHAT. Both Midwives A and B repeatedly acknowledged that this design feature supported them to capture detailed information in a more organised fashion. They likened it to a 'one stop shop' that enabled them to ask all mandatory questions in a way they felt was more 'streamlined'.

> '…when they were answering the questions through the MatCHAT app that was a lot easier and…it's more detailed, I think, than what we could screen…' [Midwife B]

Midwives told researchers of being expected to ask an extensive number of questions during their appointments and often finding it difficult to ensure that each area of potential concern has been appropriately investigated.

> 'But the beauty of MatCHAT is that, you know, you can just open it up and see what you need to do.' [Midwife E]

Although the electronic delivery of MatCHAT was not the midwives' explicit preference, they acknowledged this to be relevant and in keeping with the direction of maternity services towards increased digitalisation. Their narratives indicated an acceptance rather than a preference for technology.

> 'I think it's… where it's all heading now…' [Midwife E]

Most expressed some apprehension regarding a complete departure from a manual, paper-based system towards the sole use of technology; however, they continually reiterated that more technology was inevitable.

> '…there is no way that technology and electronic records can go away.' [Midwife F]

One midwife who did not use MatCHAT was firmly against the electronic format. She expressed a preference for a face-to-face screening and believed an electronic mechanism would hinder the rate of disclosure in her clinic. Her narrative suggests that, for some, the electronic delivery of MatCHAT may have been a barrier to participation and implementation.

> 'The process of screening feels like it should be first and foremost a conversation. I do respect that an online test is a good idea, but I can't take away the conversation.' [Midwife C]

Midwives who implemented the tool and became familiar with its functionalities indicated the need for MatCHAT to be translated into a variety of languages. They stressed that they frequently care for women of diverse backgrounds, who often speak very minimal English. In the absence of translations, the midwives feel a time pressure imposed through the use of an interpreter.

> 'I haven't administered it to people that don't have good English. I've just decided that it's just too hard.' [Midwife A]

However, the midwives were aware that the limited availability of other languages was a function of the research context, and that translation into other languages was a viable option going forward, so they were minimally concerned about the ongoing implications of the research prototype being English-only.

Midwives' knowledge

All midwives agreed that they have a role in mental health assessment, and that midwives are in a unique position to evaluate the mental health of their patients.

> 'I think it is essential. It's as much a part as asking if you've had previous operations.' [Midwife E]

They were particularly aware of the implications associated with perinatal depression and were able to recount stories about their own experiences in caring for women with depression. They described these interactions as the reason behind their desire for a routine mental health screening tool.

> '…we need a system that's going to make it simple and quicker and effective and that follows on if you want services to actually act on what you found…' [Midwife F]

The midwives expressed that, before MatCHAT, they were limited in their awareness of the appropriate referral pathways or the available supports, and the tool enabled them to ensure patient-specific and patient-centred referrals. They expressed feelings of support by this functionality.

> '…previous to MatCHAT, if they'd answered, um, positively to it, it was where do you go from here? There was one time I used it in regard to someone who screened in anxiety and just being able to give her some resources to go and look at which was all she wanted at the time but, um, was helpful…' [Midwife A]

Barriers to implementation

The final theme describes interaction between the physical and non-physical contextual environment and accompanying resources that influenced whether MatCHAT was perceived as an acceptable, feasible or useful tool.

The midwives were unanimous that they were very busy during the study period. MatCHAT was 'one more thing' in their hectic work schedule, and this influenced the low uptake.

> 'I think there weren't so many midwives who were positive about it just purely because it was one more thing on top of a caseload that was already completely, completely overflowing.' [Midwife F]

They indicated their use might have been different if the study had taken place at a different time.

> '…I do wonder whether if it were a quieter time of the year, like now, … I wonder whether that would be easier.' [Midwife E]

However, although the study period was particularly busy, the midwives experience year-round pressure from their heavy workload and limited time. In their view, their working demands and subsequent time constraints prevented them from using MatCHAT regularly (or at all).

> 'This is what my diary looks like. … Yep, they are full clinics. And quite often they are starting at 7:30am in the morning or 8:00am in the morning. And they [clinics] are very, very busy and very full. So, I think I prioritise what I need to do first and when there isn't time to do those extra things, that's why it's gone by the by.' [Midwife D]

They explained that their time constraints are caused both by a perceived excessive workload and by an ever-growing number of required tasks, with inappropriate funding and insufficient resourcing.

> 'We also have other things that are cropping up all the time... So, it's, um, it's just trying to find the time to do everything and do it well.' [Midwife B]
>
> 'The problem is the resources…' [Midwife E]

The midwives who did not use MatCHAT thought that it would increase the length of appointments. MatCHAT, a tool intended to aid and support them, was viewed as burdensome.

> 'I was in conflict because I know I needed to ask those questions … and MatCHAT would have been useful for that, but in another way, it was going to take up a large chunk of time.' [Midwife D]

However, Midwife A, who successfully implemented MatCHAT into her regular practice, found it feasible to implement and an aid to her efficiency. The potential for MatCHAT to be time-consuming could be avoided by completing other necessary work while the patient was answering the screening questions.

> 'I suppose doing the MatCHAT can take a little longer, but ... I found if they were doing screening and I was doing notes or something like that then it kind of worked well together. Although it was time taken within the appointment, I think overall it cut down time in regard to what screening I would normally do anyway.' [Midwife A]

The midwives who did not use MatCHAT were also worried that screening might 'open a can of worms'. Despite the provision of the stepped-care resource package and reassurance from a maternal psychiatrist that they could refer to her whenever needed, they described past experiences where services were not immediately available.

> 'Once we've identified somebody you want to know that we can refer them on to get that care and actually provide her with what she needs. Um, it's very frustrating when that doesn't happen.' [Midwife F]
>
> 'It worries me that we could, we could actually be opening a can of worms that we can't actually deal with… I feel exasperated… maternal mental health can't actually cope with the numbers of women who need their services.' [Midwife D]

Although Midwife F did not use the tool, she still identified a potential benefit of MatCHAT in encouraging an increase in the support resources available.

> '…The more improved screening is, the more numbers we can say, well look this is the number of women that we've got, now you need to give us more resources. We can actually use this as a tool for getting those resources.' [Midwife F]

Physical barriers to MatCHAT implementation included limited Wi-Fi reach and the inconstant location of the midwives' clinical appointments. The tablets provided had 4G capability, but the midwives were not able to effectively use the tablet at their external clinics or in patients' homes.

> 'We never overcame the fact that I had to use it here and not in my community clinic. I couldn't use it at home, if I visited a woman at home. And I, and I do visit women at home regularly so that

eliminated a lot of opportunity to use MatCHAT.' [Midwife D]

Even within the hospital, midwives worked in several different places.

'I also had to carry a tablet, and I am currently carrying three mobile phones (laughs) already, and I think that, that the, just a tablet on top of everything else made that also another obstacle.' [Midwife D]

'It was in my drawer…I forgot to take it over with me.' [Midwife E]

Discussion

Midwives articulated a need for a tool to assist screening with clarity and enthusiasm, and MatCHAT was positively regarded as appropriate to this need. The composite design and patient-centred approach were recognised strengths, and midwives who overcame the initial challenge of a change in practice found MatCHAT easy to use, time-efficient and simplified the screening process.

Midwife narratives, particularly within the sub-theme 'opening a can of worms', give voice to fundamental issues in the continuing debate about the potential harms associated with screening. First, undertaking screening is ethical only when there are resources available for diagnosis and treatment, and second, the acceptability of asking sensitive questions is predicated on the ability to give helpful feedback.[15] The inbuilt provision of decision support and a book of responses and tailored resources were designed to support midwives in managing problems that were identified and the consequences of disclosure. However, in this study, midwives viewed identified problems as binary – as requiring either no action from them or referral to secondary services. Midwives who did not implement MatCHAT were particularly concerned that it would uncover an unsurmountable number of patients requiring referral. This dichotomised perspective of mental health, addiction and family violence referrals permeated the uptake of MatCHAT, and as a result, there was limited exploration of the resources provided. This suggests that a culture shift is required for midwives to view themselves as able to direct women to educational and self-management resources, as well as to view general practice and community agencies as part of the team. However, and importantly, this may reflect a limitation of the generalisability of this study, as community midwives in tertiary centres have high caseloads, less opportunity for continuity of care and more services available to refer to, whereas the service context is considerably different for midwives who are self-employed, or less urban.

Midwife participants were enthusiastic to contribute to the co-design of a tool that would explore multiple psychosocial issues simultaneously. They were knowledgeable about what was required of them, and requested that substance use was included, to ensure professional and institutional requirements were addressed methodically. Yet, MatCHAT uptake was low and it was described as an additional burden. Extensive operational barriers – particularly heavy workload, wifi limitations and workplace mobility – need to be addressed before universal screening will be possible, and then MatCHAT may be a support for screening in the maternal care setting.

The lack of response from women who used this tool warrants consideration. Twenty women agreed to use MatCHAT, and a high number of positive screens were identified; however, none responded to requests for feedback on the tool. This is surprising given that electronic screening facilitates disclosure in perinatal settings and in one study, 69% reported they were glad to be asked and 87% took it as evidence their provider cared about them.[16] Other perinatal studies in New Zealand with participants with higher burdens of psychopathology have had considerably higher participation,[17] suggesting that MatCHAT may not have been a sufficiently relational approach to facilitate participation. Alternatively, the timing (over the holiday period, which is renowned for lower staffing) and short duration of this study likely contributed to poor uptake by both midwife and perinatal participants.

Internationally, successful perinatal screening has been demonstrated and stepped-care implemented.[9,18] This has required time, integration of services and enhanced interdisciplinary collaboration on many levels.[19] This has been recommended in New Zealand,[20] but there has been limited progress in implementing these recommendations.[21] MatCHAT has potential to support screening if attitude and operational barriers can be overcome.

Competing interests

The authors declare no competing interests.

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References

1. Bauer A, Parsonage M, Knapp M, et al. The costs of perinatal mental health problems. London, UK: London School of Economics and Political Science; 2014.
2. Shonkoff JP, Garner AS, Committee on Psychosocial Aspects of Child and Family Health, Committee on Early Childhood, Adoption, and Dependent Care, Section on Developmental and Behavioral Pediatrics. The lifelong effects of early childhood adversity and toxic stress. Pediatrics. 2012;129(1): e232–46. doi:10.1542/peds.2011-2663
3. Jacques N, de Mola CL, Joseph G, et al. Prenatal and postnatal maternal depression and infant hospitalization and mortality in the first year of life: a systematic review and meta-analysis. J Affect Disord. 2019;243:201–8. doi:10.1016/j.jad.2018.09.055
4. Stein A, Pearson RM, Goodman SH, et al. Effects of perinatal mental disorders on the fetus and child. Lancet. 2014; 384(9956):1800–19. doi:10.1016/S0140-6736(14)61277-0
5. National Collaborating Centre for Mental Health UK. Antenatal and postnatal mental health: clinical management and service guidance: Updated edition. Leicester, UK: British Psychological Society; 2014.
6. New Zealand Ministry of Health. Healthy beginnings: developing perinatal and infant mental health services in New Zealand. Wellington: Ministry of Health; 2012.
7. Holden G, Corter AL, Hatters-Friedman S, Soosay I. Brief report. A qualitative study of maternal mental health services in New Zealand: perspectives of Māori and Pacific mothers and midwives. Asia Pac Psychiatr. 2020;e12369.
8. Shah K, Corter A, Bird A, Goodyear-Smith F. A primary care programme to improve identification and stepped-care support of Asians with mental health and lifestyle issues. J Prim Health Care. 2019;11(1):39–46. doi:10.1071/HC18043
9. Highet N, Gamble J, Creedy D. Perinatal mental health and psychosocial risk screening in a community maternal and child health setting: evaluation of a digital platform. Prim Health Care Res Dev. 2019;20:e58. doi:10.1017/S1463423618000336
10. Bradford S, Rickwood D. Young people's views on electronic mental health assessment: prefer to type than talk? J Child Fam Stud. 2015;24(5):1213–21. doi:10.1007/s10826-014-9929-0
11. Goodyear-Smith F, Warren J, Bojic M, Chong A. eCHAT for lifestyle and mental health screening in primary care. Ann Fam Med. 2013;11(5):460–6. doi:10.1370/afm.1512
12. Gjerdingen D, Crow S, McGovern P, et al. Postpartum depression screening at well-child visits: validity of a 2-question screen and the PHQ-9. Ann Fam Med. 2009;7(1):63–70. doi:10.1370/afm.933
13. Spitzer RL, Kroenke K, Williams JB, Löwe B. A brief measure for assessing generalized anxiety disorder: the GAD-7. Arch Intern Med. 2006;166(10):1092–7. doi:10.1001/archinte.166.10.1092
14. Thomas DR. A general inductive approach for analyzing qualitative evaluation data. Am J Eval. 2006;27(2):237–46. doi:10.1177/1098214005283748
15. Reilly N, Kingston D, Loxton D, et al. A narrative review of studies addressing the clinical effectiveness of perinatal depression screening programs. Women Birth. 2020;33(1):51–9. doi:10.1016/j.wombi.2019.03.004
16. Kingston D, Austin M, McDonald SW, et al. Pregnant women's perceptions of harms and benefits of mental health screening. PLoS One. 2015;10(12):e0145189. doi:10.1371/journal.pone.0145189
17. Wright T, Stevens S, Wouldes TA. Mothers and their infants co-admitted to a newly developed mother–baby unit: characteristics and outcomes. Infant Ment Health J. 2018; 39(6):707–17. doi:10.1002/imhj.21742
18. Honikman S, Van Heyningen T, Field S, et al. Stepped care for maternal mental health: a case study of the perinatal mental health project in South Africa. PLoS Med. 2012;9(5): e1001222. doi:10.1371/journal.pmed.1001222
19. Warmelink JC, Wiegers TA, de Cock TP, et al. Collaboration of midwives in primary care midwifery practices with other maternity care providers. Midwifery. 2017;55:45–52. doi:10.1016/j.midw.2017.08.010
20. Farquhar CM. Seventh annual report of the Perinatal and Maternal Mortality Review Committee: reporting mortality 2011. Wellington: New Zealand Ministry of Health; 2013.
21. Perinatal and Maternal Mortality Review Committee. Eleventh annual report of the Perinatal and Maternal Mortality Review Committee. Wellington, New Zealand: Health, Quality and Safety Commission; 2017. [cited 2019 September 19]. Available from: http://www.hqsc.govt.nz/our-programmes/mrc/pmmrc