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7 **Title**

8 Irish and New Zealand Midwives' expertise at preserving the perineum intact (the MEPPI
9 study): perspectives on preparations for birth.

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29 **Abstract**

30 **Objectives:** Perineal trauma during birth can result in short or long term morbidity for
31 women. Internationally, rates of episiotomy and severe perineal tears vary considerably. In
32 New Zealand, in 2011, and in a trial of midwife-led care in Ireland, episiotomy rates were
33 found to be considerably lower than those in many other countries. A qualitative
34 exploratory study was undertaken to ascertain how midwives achieve these low rates, in
35 these countries and settings.

36 **Design and participants:** A qualitative exploratory study was conducted. Midwives expert in
37 preserving the perineum intact (PPI) from two maternity units in the Republic of Ireland and
38 from varied birth settings in New Zealand, were eligible to participate. Twenty-one
39 consenting midwives took part, seven from Ireland and 14 from New Zealand.

40 **Methods:** University ethical approval was granted. Face-to-face, semi-structured interviews
41 were used to collect the data. Interviews were recorded and transcribed verbatim. The data
42 were analysed using *Ethnograph* software and were organised into prominent themes.

43 **Findings:** Four themes were identified; '*Sources of knowledge for PPI*', '*Associated factors*',
44 '*Decision-making on episiotomy*', and '*Preparations for PPI*'. Participants drew heavily on
45 multiple sources of knowledge in building their own expertise for PPI. Physical
46 characteristics of the perineum featured prominently as factors leading to PPI. Episiotomy
47 was, in the main, only performed when there were signs of fetal distress. Antenatal perineal
48 massage was supported.

49 **Conclusion:** This study provides valuable insight into the views and skills of midwives, with
50 expertise in PPI at birth, adding to the body of evidence on this topic.

51 **Keywords:** *'Midwives' expertise*, *'intact perineum'*, *'perineal care'*, *'perineal trauma'* and
52 *'episiotomy'*

53

54 **Highlights**

- Valuable insight into the views and skills of midwives who have expertise in preserving the perineum intact are provided.
- The expert midwives demonstrated an up to date knowledge of research evidence and have applied it in their practice.
- The study contributes to the evidence base and has identified ways of minimising perineal trauma at birth
- The study provides a precedent for other similar qualitative studies on this topic

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64 **Introduction**

65 Perineal trauma at birth is distressing for women and can cause short or long term
66 morbidity. Perineal pain, postpartum dyspareunia and symptoms of depression and stress,
67 for example, are more commonly increased in women with perineal trauma (Andrews et al.
68 2008; Laws and Sullivan, 2009; Dunn et al. 2015). Recognising that a perineal 'no trauma'
69 rate for all women is not likely achievable, identifying ways to minimise even some instances
70 of perineal trauma would be beneficial (Albers et al. 2005). The individual midwife has been
71 identified as having an impact on overall perineal health (Ott et al. 2015).

72 Historically, in an attempt to protect the perineum from severe trauma, routine
73 episiotomies were often performed during childbirth. A systematic review of eight
74 randomised trials, involving 5541 women, however, showed that restrictive episiotomy,
75 compared with routine episiotomy, resulted in less severe perineal trauma, less suturing
76 and fewer healing complications. No differences were found, between the groups, in severe
77 vaginal/perineal trauma, dyspareunia, urinary incontinence or in measures of pain (Carroli
78 and Migini, 2009). Although episiotomy rates have fallen considerably in practice, large
79 variations in rates still exist between countries. In 2010, for example, episiotomy rates for
80 vaginal births for all women were 5-7% in Denmark, Sweden and Iceland; these countries,
81 however, had the highest rates of severe perineal tears in Europe (3-4%). Norway and the
82 United Kingdom (UK) had moderately low episiotomy rates (19-24%), with average severe
83 perineal tear rates (2-3%). Other countries, for example, Poland and Portugal, continue to
84 have exceptionally high episiotomy rates of 68-73% (EURO-PERISTAT, 2013).

85 New Zealand (NZ) is one country where episiotomy rates are considerably lower than in
86 many others. In 2011, 866 midwives were registered with the Midwifery and Maternity

87 Providers Organisation (MMPO) in NZ and returned statistics on all births under their care.
88 Of the 9673 nulliparous women who had a vaginal birth (including instrumental birth), 2157
89 women (16.7%) received an episiotomy (MMPO, 2011). Similar findings were obtained in a
90 recent Irish trial of midwife-led care (the MidU study) where the episiotomy rate for all
91 vaginal births in the midwife-led care arm, for all parities, was 14% and 8% (n=293/758) in
92 nulliparous women (Begley et al. 2011). As these perineal outcome results from NZ and
93 Ireland are unusually good, and differ from the findings of many other studies across the
94 world, an exploratory study was designed to ascertain how these midwives achieve such
95 good rates.

96 **Aim**

97 To explore Irish and New Zealand expert midwives' views of the skills that they employ in
98 preserving the perineum intact (PPI) during spontaneous vaginal birth, with a focus on
99 preparation for birth (due to the wealth of data in this study, the study's findings are
100 presented across two study reports; this is the first of these).

101 **Methods**

102 *Design*

103 To gain deeper insight into the nature and meaning of experiences, an exploratory,
104 descriptive approach was used in the study. Using exploratory description is advantageous
105 as it allows for a rich narrative of experiences and is considered ideal when there is limited
106 information on a topic (Burns and Grove 2011). As qualitative descriptive studies present
107 the facts of the case, drawn from naturalistic enquiry, events are not described in terms of a
108 conceptual or theoretical framework (Sandelowski 2000); we do, however, use some of the
109 tenets of grounded theory, such as the constant comparative method of analysis, as we

110 believe it adds rigour (Sandelowski 2000). Ethical approval was granted by the University's
111 Faculty of Health Sciences Research Ethics Committee, the New Zealand College of
112 Midwives (NZCM) and the Irish Health Service Executive (Dublin North-East). Participation in
113 the study was completely voluntary, with written consent obtained before each interview.
114 Participant anonymity was maintained by assigning interview codes (NZ 1-14 and IE 1-7). All
115 data (interview tapes and transcripts) were securely stored in a locked filing cabinet in a
116 locked office in accordance with the Irish Data Protection (Amended) Act 2003
117 (<https://www.dataprotection.ie>).

118 *Setting*

119 The study settings included hospital, home and community birth settings in NZ and two
120 hospital birth settings, with alongside midwife-led units (MLUs), in the Republic of Ireland.

121 *Sampling and Recruitment*

122 Sampling was purposive and based on the following inclusion criteria; participants had to be
123 employed in either one of the two hospital units in the Republic of Ireland, or practising as a
124 Lead Maternity Carer (case-loading) in NZ with data available in the MMPO database, and
125 be classified as an 'expert' in PPI. To be an 'expert', midwives had to have a no suture rate
126 (intact perineum or first degree tears not requiring sutures) for nulliparous women, for the
127 three and a half years before the study (2010-2013), of greater than 40%, episiotomy rate of
128 less than 11.8% (the average taken from all NZ and Irish MLU data), and serious perineal
129 tear rate of less than 3.2%. The midwifery managers in Ireland and the Chief Executive
130 Officer (CEO) of the NZCM acted as gatekeepers for identifying eligible participants and for
131 distributing the study information. Midwives who were willing to take part indicated their
132 intention by contacting directly one of the research team. This ensured that the gatekeepers
133 in each country were not informed as to who had chosen to take part in the study. A blanket

134 reminder was sent to all eligible midwives, by the CEO and midwifery managers, 14 days
135 after the first circulation.

136 *Data Collection*

137 Data collection involved face-to-face, semi-structured interviews, conducted by the lead and
138 last authors, who are both experienced in qualitative interview techniques. The interviewer
139 in NZ was not known by most participants but, by chance, three of them had also been
140 interviewed by her for the MEET study (Begley et al. 2012). The interviewer in Ireland was
141 probably known by reputation to all Irish participants and had worked with four of them
142 previously. Interviews took place at a venue and time suitable to the participants, in early
143 2014 and 2015. An interview schedule (Box. 1) was used to guide the interviews to ensure
144 consistency across interviews. A short demographic questionnaire was also completed by
145 participants at the start of the interview and labelled with the participant's code number. All
146 interviews were digitally recorded and subsequently transcribed verbatim. The average
147 length of interviews was 40.4 minutes (standard deviation (SD) 5.10), ranging from 34 to 48
148 minutes.

149 **Box 1: Interview schedule**

- To start with, can you remember, when did you first start trying to preserve the perineum intact (PPI)?

Was there a particular reason why you chose to do this?

- Are there any particular circumstances when you would definitely perform an episiotomy?
- How do you know that a woman's perineum is going to stretch and not tear?
- Try to imagine you are caring for a primigravid woman now, who is in the second stage of labour and the head is visible. Please tell me exactly what you do, in order, for the next half hour.

Prompts: position, encourage pushing or not, touching perineum or not, flexing head or not, signs of potential tearing or stretching, any special techniques (digital stretching, support with heel of hand, etc). Also, how exactly any practical manoeuvres are achieved

- Are there any other factors that you think help to prevent a woman's perineum tearing (or make it more likely to tear)?

Prompts: general health, nutrition, exercise, race, age, preparation in pregnancy

- Is there any advice you provide to minimise perineal trauma during labour and birth?

Prompts: Birth position? Use of perineal massage or warm pads during birth, etc?

- How do you know whether or not a woman requires sutures in her perineum?
- What advice do you give to women around perineal care following birth?
- Is there anything else you would like to add?

Thank you for your help

150

151 *Data Analysis*

152 Thematic analysis was used to analyse the data. The computer software package,
153 *Ethnograph* version 6.0 (<http://www.qualisresearch.com/>), assisted with this. Initial findings
154 were shared between researchers and were tested in successive interviews, using the
155 constant comparative method; evidence of contradictory views was looked for by
156 questioning subsequent participants (Mays and Pope 2000). Theoretical saturation occurred
157 at approximately interview 15, with following interviews serving to test emergent themes.

158 *Rigour*

159 To improve credibility, prolonged engagement with the data was undertaken and
160 participant's own words were used in presenting the findings. Stepwise replication was used
161 to enhance dependability, whereby two of the researchers analysing the data swapped a
162 number of transcripts, allowing for independent interpretations of the data which could be
163 compared and contrasted subsequently (Cronin et al. 2015). Their analysis was checked by
164 'peer debriefing' (Kitto et al. 2008), where all other authors were sent two transcripts from
165 participants not in their country, to read in conjunction with the draft findings and comment
166 on any aspects that were unclear or missing. An 'audit trail' was maintained to ensure

167 confirmability (Streubert and Carpenter, 2011). This was achieved through a detailed
 168 account of the conduct of fieldwork and through providing examples of raw, coded,
 169 categorised and thematic data. A draft of the findings was sent to all participants with a
 170 request for any comments. All feedback received was incorporated into the final draft.

171 **Findings**

172 *Participant characteristics*

173 Twenty-one midwives consented and took part in the study. Seven midwives were from
 174 Ireland and 14 from NZ. Participants’ overall episiotomy rate, for the previous three and a
 175 half years, was 3.91%, ‘no suture’ rate (intact perineum and first degree tears) was 59.24%,
 176 and third and fourth degree laceration rate was 1.08% (Table 1), confirming these
 177 participants’ status as ‘expert’ in PPI.

178 **Table 1: Participant characteristics and outcome**

| Characteristic or outcome | Ireland | New Zealand | Total |
|--|---|---|---|
| Number of participating midwives | 7 Midwife-led unit (4) Hospital labour ward (3) | 14 All Lead Maternity Carers | 21 |
| Mean length of time working as a registered midwife | 15.9 years (SD 11.8) (range: 5-36 years) | 16.7 years (SD 10.6) (range: 5-36 years) | 16.6 years (SD 10.6) (range: 5-36 years) |
| Mean length of time consciously trying to preserve the perineum intact | 14.9 years (SD 10.3) (range: 5-30 years) | 14.2 years (SD 7.4) (range: 5-30 years) | 14.5 years (SD 8.2) (range: 5-30 years) |
| Never taught techniques of preserving the perineum | 2 (29%) | 2 (14%) | 4 (19%) |
| Taught techniques in both classroom and in practice | 5 (71%) | 12 (86%) | 17 (81%) |
| Episiotomy rate | 12/157 7.64% | 17/584 2.91% | 29/741 3.91% |
| ‘No suture’ rate* | 80/157 50.96% | 359/584 61.47% | 439/741 59.24% |
| 3 rd /4 th degree tear rate | 3/157 1.91% | 5/584 0.86% | 8/741 1.08% |

179 * Intact perineum plus first degree tears not sutured

180 **Thematic analysis**

181 Four core themes on midwives' expertise emerged from the data. These were '*Sources of*
 182 *knowledge for PPI*', '*Associated factors*', '*Decision-making on episiotomy*', and '*Preparations*
 183 *for PPI*'. Table 2 presents the codes, including extent of use, categories and themes that
 184 emerged from the data.

185 **Table 2: Codes, categories and themes**

| <i>Code</i> | <i>No. using</i> * | <i>No. times used</i> § | <i>Categories</i> | <i>Theme</i> |
|------------------------------|--------------------|-------------------------|--|-------------------------------|
| Taught wrongly in practice | 11 | 14 | 1. Practice-based teaching 2. Practice-based learning | Sources of knowledge for PPI |
| Taught correctly in practice | 4 | 5 | | |
| Taught by experts | 6 | 10 | | |
| Learn from feedback | 8 | 20 | | |
| Trial and error | 5 | 7 | | |
| Other midwives' practice | 11 | 22 | | |
| Factors leading to tears | 14 | 54 | 1. Factors leading to tears 2. Factors leading to PPI | Associated factors |
| Factors leading to PPI | 4 | 8 | | |
| Nutrition | 7 | 10 | | |
| Baby's hand up | 8 | 16 | | |
| Water helps | 8 | 11 | | |
| Reasons for trying to PPI | 13 | 31 | 1. Reasons for not doing an episiotomy 2. Reasons for doing an episiotomy | Decision-making on episiotomy |
| Reasons for doing episiotomy | 20 | 64 | | |
| Preparation in pregnancy | 14 | 33 | 1. Preparation in pregnancy 2. Aids for PPI | Preparations for PPI |
| Antenatal massage | 19 | 40 | | |

186 * Indicates the number of individuals using that code in their interview

187 § Indicates the number of times that code was used throughout all of the interviews

188

189 *Theme 1: Sources of knowledge for PPI*

190 This theme explains how the midwives developed their knowledge base and abilities as they
191 determined a need to preserve the perineum, including actions which shaped their own
192 practices and expertise. The theme incorporates two categories; *'practice-based teaching'*
193 and *'practice-based learning'*.

194 Practice-based teaching

195 Eleven participants (52%) discussed how they were taught to care for the perineum in
196 practice, teaching that had often incorporated the use of episiotomy to "reduce the risk of
197 third/fourth degree tears." The participants were able to identify what they believed were
198 incorrect or correct practices for PPI.

199 *"She'd done a prophylactic episiotomy and I, I sort of, say to her, how can you justify*
200 *damaging in order to prevent damage."* (NZ-10)

201 They further identified how they then developed or adapted their own practice accordingly,

202 *"But I stopped doing that because I noticed ...they'd often have bruised perineums*
203 *where the finger tips, you could see where the fingers had been, you know. So I*
204 *thought 'I'm not going to do that'."* (NZ-4)

205 and moved towards an overall philosophy of PPI.

206 *"I trained in the U.K. and the hospital I actually trained in would have had a high rate of*
207 *episiotomies, and then I moved to a London hospital, a very very low rate of episiotomies...So*
208 *I suppose really my aim would have been to make sure that as a midwife, you know, that I*
209 *would try and protect the perineum. To me that was always very important"* (EI-7)

210 Practice-based learning

211 Feedback from women provided an important source of information and practice-based
212 learning for participants. Listening to women, being sensitive to their cues and discussing

213 with them their birth wishes played an important role in how midwives cared for the
214 perineum during birth.

215 *“...you’ll get reports back for some women that find the perineal repairs was as*
216 *traumatic as the labour... You know, it’s almost like, they’re done and dusted at that*
217 *stage and then to end up have to have stitches, is another hurdle for them. And they*
218 *don’t have the energy to, to cross that.” (EI-5)*

219 The midwives recognised that different women had different expectations, preferences and
220 desires but that most women wanted to avoid perineal trauma. Working with and observing
221 other experienced midwives also provided a source of practice-based learning. In these
222 scenarios, participants watched and learned from other skilled, experienced midwives, and,
223 subsequently, assimilated these skills and techniques in their own practice.

224 *“....maybe just taking note of what other midwives maybe with more*
225 *experience...what they were doing... just kind of building up, you know, my own*
226 *experience and my own techniques as time went on.” (EI-3)*

227 One technique, which a number of participants referred to, was other midwives’ practice of
228 placing their fingers on the perineum, or just inside the vagina, and applying downward
229 pressure, or stretching, to the area as a woman was pushing. The notion here was to assist
230 the perineum to stretch or widen the vaginal outlet for the baby’s head to pass through.

231 *“.... another thing that people used to do is put their fingers in and stretch kind of as*
232 *the head was coming. They’d maybe put pressure on the posterior vaginal wall*
233 *downwards with their fingers.....and I remember midwives telling me to do that and I*
234 *was like ‘ah, I don’t want to do that’ and I knew the women didn’t like it” (EI-1).*

235 *“Although I have seen in my training I had seen midwives doing it so just putting their*
236 *hand, their forefinger in there and thumb around the perineum and putting pressure*

237 *on it. But that's never been part of my practice.” (NZ-7)*

238 Overwhelmingly, all of the participants who mentioned this practice expressed that they did
239 not agree with it, nor was it a technique that they, personally, would use.

240

241 *Theme 2: Associated factors*

242 Two categories dominated this theme. These were ‘*factors leading to PPI*’ and ‘*factors*
243 *leading to tears.*’

244 Factors leading to PPI

245 Although many of the midwives discussed specific factors, overall these varied, and the
246 expert midwives were of the main view that a combination of factors led to PPI.

247 *“I think it's a mixture of things....a number of different kind of factors in preserving it*
248 *so the upright position or all fours, whichever, non-coached pushing, getting or*
249 *asking the mum to go very slowly at the end, as the baby is crowning.” (EI-1)*

250 Position was discussed by the majority of participants, with ‘all fours’ popular,

251 *“It's very easy to see the perineum on all fours, it's much easier I find....” (EI-2)*

252 but, interestingly, birth in water was not favoured particularly for PPI.

253 *“I think I get less tears on the bed than I do in the water....well it may be similar but I*
254 *don't find that the water saves the perineum as well as the warm saline [pads on the*
255 *perineum] really....” (NZ-9)*

256 *“But in those situations [previous 3rd degree tears]...it's quite important I will say to a*
257 *woman it would be really useful, perhaps not to birth in the pool.” (NZ-11)*

258 Eight midwives believed, however, that labouring in water, as distinct from birthing there,

259 helped as it softened the perineal tissue,

260 *“If they have been in the bath....often their tissues are softer and stretchier.” (NZ-6)*

261 Factors leading to tears

262 The participants’ spoke of a variety of factors that they believed led to tearing. One factor,
263 in particular, was speed and woman’s control during the second stage. Participants were in
264 agreement that more extreme expulsive pushing, or no control over the force of the push,
265 increased tears.

266 *“...any bad tears that I've had, I would've found the mums would have been*
267 *extremely expulsive with their pushing.... And I would've found that the mum had no*
268 *control over her pushing and was just bearing down consistently.” [EI-5]*

269 The baby’s position and the baby’s hands or shoulders as they pass over the perineum, also
270 played a role in causing tears.

271 *“I suppose it’s all to do with like the position of baby as well, you know if you have a*
272 *direct OP or something like that the whole way through, maybe delivering OP as well,*
273 *you know that's obviously going to impact on the perineum as well.” (EI-3)*

274 The physical appearance of their perineum also featured prominently; for example, one
275 midwife perceived the physicality and tissue type of the perineum as more influential than
276 baby size.

277 *“Nothing to do with baby size I don't think. I think it’s purely been their tissue type...*
278 *it’s like stretching any fabric and it’s just got a certain breaking point and it just*
279 *goes.” (NZ-6)*

280

281 *Theme 3: Decision-making on episiotomy*

282 Decision-making on performing an episiotomy incorporated two categories; *'reasons for not*
283 *doing episiotomy'* and *'reasons for doing episiotomy'*.

284 Reasons for not doing episiotomy

285 Participants felt a responsibility and a duty of care to women in reducing perineal trauma
286 and PPI. The participants understood that perineal trauma extended beyond having an
287 immediate impact at the time of birth; rather could have an effect on a woman's ability to
288 care for and bond with her baby in the postpartum period. For this reason, PPI was
289 important to them as midwives.

290 *"I just feel that it's, as a midwife it's our duty of care to be there for the woman and*
291 *to reduce perineal trauma for her because I think if we can, it can have a huge impact*
292 *afterwards on her bonding with her baby, you know and really reducing the amount*
293 *of discomfort and that all helps with the bonding and with breast feeding and all*
294 *that. And I do think it's a duty of care we have for the women."* (EI-2)

295 Participants also expressed personal and clinical practice reasons for consciously trying to
296 preserve the perineum at childbirth. These included personal past birth experiences and
297 past clinical experiences.

298 *"I think maybe from my own experience it's sort of having my own babies that it*
299 *started to kind of come into my head for other women."*(EI-1)

300 Reasons for doing an episiotomy

301 Midwife experts in PPI rarely performed episiotomy and were very considerate when
302 deciding on whether, or not, one was required.

303 *"I definitely would think a lot about it before doing an episiotomy so I would, it*
304 *wouldn't be something that I would, like obviously, routinely do or, like, do lightly or*
305 *not think about"* (EI-3)

306 Primarily, episiotomy was performed only in circumstances or signs of fetal compromise,
307 such as bradycardia or decelerations in the fetal heart rate.

308 *"If it [fetal heart] sustained at eighty, I wouldn't be happy obviously because it's very*
309 *slow to recover. But then I'd be thinking okay, we need some help, we need maybe to*
310 *think about an episiotomy."* (NZ-12)

311 A tight, non-stretching perineum, was also considerably influential in deciding to perform
312 episiotomy.

313 *"...the head was really, really tight coming up.....it just felt really, really tight, I had*
314 *given it time to crown, for the head to come up but it just wasn't coming up and just*
315 *taking into consideration everything.....I just had no other option but to do an*
316 *episiotomy."* (EI-3)

317 Lastly, previous perineal trauma, such as 3rd or 4th degree tears, also emerged as influential
318 in making decisions to perform, or not, an episiotomy. In the main, participants did not feel
319 that previous trauma was a clinical indicator for performing an episiotomy.

320 *"I mean I've looked after women with previous third degree tears; that to me*
321 *wouldn't be an indication to do an episiotomy."* (EI-2)

322 However, participants indicated that they might be directed to, or may experience pressure
323 from others, to do so.

324 *"....sometimes in the case of a woman with a previous third degree tear or somebody*
325 *who has had a previous episiotomy.....It might actually be documented that the*

326 *woman is for an episiotomy this time.” (E1-3)*

327 Even when pressure or directions to perform an episiotomy were present, this did not
328 lessen participants’ consideration of performing one, and did not indicate that they would
329 automatically perform one either.

330 *“That you know, someone is coming in with a third degree tear. And you know,
331 maybe at report, you'd be like ‘obviously, you will be giving an elective epis with
332 that.’ And then you're, sort of, at delivery, like, ‘I don't know, will I?’ ” (E1-4)*

333

334 *Theme 4: Preparation in pregnancy*

335 There were two prominent categories in this theme. These were *‘relaying information in
336 pregnancy’* and *‘aids for PPI’*.

337 Relaying information in pregnancy

338 The midwife experts spoke about the importance of preparing women during pregnancy for
339 PPI at birth, including discussing perineal preparation during the antenatal period.

340 *“And what I do is I give them a package and it’s everything about birth, so it’s all
341 about preparing for birth...and preparing your perineum.” (NZ-5)*

342 Prior to the birth the midwives would also discuss with the woman how to slow down their
343 pushing efforts as the baby’s head is being born (a prominent theme that is explored fully in
344 the second publication). The participants indicated how they informed women of this during
345 pregnancy and often reminded them again during labour, emphasising, perhaps, how
346 important this preparation was, for them, for PPI.

347 *“...when we do a birth plan I talk to them [women] about second stage....and I
348 always remind them that I'm going to, you know, be telling them to stop pushing*

349 *when the head's coming out...I just give that reminder because I think with what*
350 *they've been through....I think they've forgotten what I've told them four weeks ago."*

351 (NZ-9)

352 *"I think it is so important to tell her earlier, you know, not just wait till the second*
353 *stage to tell her to stop pushing... I remind her a couple of times during labour."* (EI-7)

354 Aids for PPI

355 Antenatal perineal massage and the 'Pink Kit', recently reviewed in the midwifery press
356 (Buckley, 2004), emerged as two aids that might assist with PPI at birth. The participants
357 were divided as to whether antenatal perineal massage was helpful for PPI, although more
358 thought it was than not (seven versus three participants, respectively). Of those who
359 favoured perineal massage for PPI, they mainly did so for nulliparas or for women who had
360 scarring from previous tears.

361 *"I do think perineum massage is certainly of value. And....for older primigravida or*
362 *for a woman that's suffered a previous nasty laceration, you know, it is really worth*
363 *doing."* (NZ-6)

364 Of the participants who described the technique of perineal massage, all encouraged
365 women to commence massage at 36 weeks' gestation, using oil, and to massage the
366 perineum externally, and internally, if able.

367 *"I try and get them to do perineal massage, at thirty-six weeks, daily, if they can. And*
368 *I really encourage that, if they can't do the internal that they at least get oil onto the*
369 *outside and lots of massage there."* (NZ-12)

370 Of the midwives who mentioned the 'Pink Kit' during conversations, all were from NZ,
371 suggesting that this is something familiar to NZ midwives, but not, perhaps, Irish maternity

372 care. The 'Pink Kit' is a birth preparation package that uses a video, a tape and a book to
373 deliver eight lessons on aspects of birthing; for example, breathing techniques, movement
374 during labour and exploring the anatomy of the pelvis and of the soft tissues, including the
375 perineum and vagina. Mixed views were reported.

376 **Discussion**

377 The expert midwives in this study, drew on a variety of sources of knowledge and developed
378 their practice through an integration of observation, careful consideration, evidence-
379 informed practice and working with women. This included, in some instances, avoiding
380 particular techniques that other midwives were observed using, or that they had previously
381 been taught, in particular, manual stretching the perineum and/or vagina as a woman
382 pushes during contractions during the second stage of labour. While research evaluating the
383 'hands on/hands poised' techniques exists (McCandish et al. 1998; Aasheim et al. 2011), no
384 research that specifically evaluates the practice of 'digitally stretching' the perineum or
385 vagina at birth was found. It is therefore reasonable to suggest, based on the testimony of
386 the expert midwives in this study, that the practice of digitally stretching the
387 vagina/perineum during childbirth should be avoided.

388 Although women are encouraged to adopt positions that are most comfortable for them
389 during labour and birth, some positions have been associated with increased rates of
390 perineal tears, for example, the supine position (Gupta et al. 2007), and are not
391 recommended (NICE, 2014). In this study, the expert midwives favoured the 'all-fours'
392 position for PPI at birth, for both greater visualisation of the perineum and for reducing
393 pressure on the perineum. Clinically and physiologically, this makes sense, as both the
394 pressure from the surface underneath a woman (usually a bed) combined with the

395 gravitational weight of the baby and uterine forces acting in a downward direction, is bound
396 to cause intense pressure on the perineal region, and even more so, if a woman is in this
397 position for a length of time. Previous research studies support the use of all-fours for PPI
398 and a reduced need for suturing (Cluett and Burns, 2009; Royal College of Midwives, 2010),
399 yet a UK survey found 49% (of 929 women) using the semi-recumbent position for birth and
400 only 10% using all-fours (Komorowski et al. 2014). This study adds to the evidence that
401 positioning is important in reducing perineal trauma.

402 Evidence surrounding waterbirth and perineal trauma rates is both conflicting and
403 controversial. Cluett and Burns (2009) suggest that immersion in water during the first and
404 second stages of labour, compared with no immersion in water, neither increases nor
405 decreases rates of episiotomy nor all other tears during childbirth. Soong and Barnes (2005),
406 conversely, reported increased perineal trauma with waterbirth compared to landbirth. At
407 present, national guidelines recommend informing women that there is insufficient high
408 quality evidence to either support or discourage giving birth in water (Lodge and Haith-
409 Cooper, 2016). In this study, the expert midwives did not overly favour birth in water for PPI,
410 but a sizeable group did suggest that labouring in water helped as it softened the perineal
411 tissue and facilitated stretching, supporting perhaps, the recommendation that further
412 research on birth in water or labour in water for PPI, is needed.

413 A number of the midwives commented on the physicality of the perineum in the context of
414 perineal tears. A short, non-stretchy perineum was considered to be associated with an
415 increased risk of tearing, and many of the midwives voiced the latter as a (rare) clinical
416 reason for performing an episiotomy. Perineal length, however, or genital hiatus length, was
417 not found to be associated with increased perineal trauma in one study that specifically

418 explored this phenomenon (Komorowski et al. 2014), although the width of the baby's head
419 circumference was. The notion that larger babies increase the risk of perineal trauma is
420 repeatedly supported in the literature (Smith et al. 2013; Perigialotis et al. 2014), yet this
421 was not considered to be a major influence by the midwives in this study. This might well be
422 one of those instances where experiential evidence conflicts directly with objective
423 statistical findings. Further qualitative enquiry, of other midwives, in other countries, who
424 are expert in PPI, is required to substantiate, or otherwise, these findings.

425 A duty of care in reducing postpartum morbidity had an important place for midwives in
426 trying to maintain the integrity of the perineum at birth. For this reason, the expert
427 midwives deliberated very carefully on their decisions and the clinical indicators, for
428 performing an episiotomy. Overwhelmingly, the majority of midwives reported that they
429 would perform an episiotomy only in circumstances where there are signs of
430 fetal/suspected fetal compromise. This is in line with evidence-based practice (Carroli and
431 Migini, 2009) and national guidelines (NICE, 2014), highlighting how these midwives have
432 competently assimilated research evidence into their practice.

433 *Strengths and limitations*

434 The study provides in-depth information, from midwives, on the skills they employ for PPI.
435 The results of the study contribute to the body of evidence for minimising perineal trauma
436 and increasing PPI at birth. The study is limited by the inclusion of midwives from two
437 countries only and the findings might not necessarily be transferable to midwives working in
438 other countries or in alternative birth settings.

439 *Implications for Practice*

440 This study has identified how this group of expert midwives work towards PPI for women
441 under their care. Aspects of this care can be considered by other midwives as they
442 themselves consider what they can do when working with women. A clear issue identified
443 by these midwives is avoidance of manual stretching of the perineum or vagina when a
444 woman is pushing during uterine contractions. The expert midwives considered this practice
445 to be distressing for women and of little value in preserving the integrity of the perineum.
446 The experts also identified that episiotomy should be avoided and only performed when
447 there is a clear clinical need. Positioning for birth is important and midwives should
448 encourage women to adopt non-supine positions. Lastly, midwives need to prepare women
449 for PPI during pregnancy and should encourage and support women to use antenatal
450 perineal massage.

451 **Conclusion**

452 This study provides valuable insight into the views and skills of midwives who have expertise
453 in PPI at birth. The expert midwives have demonstrated an up to date knowledge of
454 research evidence and have applied it in their practice. This study contributes to the
455 evidence base, has identified ways of minimising perineal trauma at birth, and provides a
456 precedent for other similar qualitative studies on this topic.

457

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460

461

462 **Abbreviations**

463 CEO: Chief Executive Officer

464 IE: Ireland

465 MEET: Midwives' Expertise in Expectant Management

466 MLU: Midwifery-Led Unit

467 MNPO: Midwifery and Maternity Providers Organisation

468 NICE: National Institute of Health and Care Excellence

469 NZ: New Zealand

470 NZCM: New Zealand College of Midwives

471 OP: Occiput-Posterior

472 PPI: Preserving the Perineum Intact

473 SD: Standard Deviation

474 UK: United Kingdom

475

476 **Ethical Statement**

477 *Conflict of Interest*

478 The authors declare they have no conflict of interest

479

480 *Ethical Approval*

481 Ethical approval was granted by the University’s Faculty of Health Sciences Research Ethics
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