

1 **Knowledge and use of sterile water injections amongst midwives in the United Kingdom: A cross-**
2 **sectional study**

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4

5 Abstract

6 Background: The use of sterile water injections (SWI) for the relief of pain in labour is popular
7 amongst midwives in countries such as Sweden and Australia. Anecdotal reports suggest the
8 procedure is used less commonly in the United Kingdom (UK) and that a number of barriers to
9 introducing the practice may exist.

10 Objective: The objective of this study was to explore the awareness and use of SWI amongst
11 midwives in the UK.

12 Design: A cross sectional study using an internet-based questionnaire.

13 Participants: Midwives with Nursing and Midwifery Council Registration and currently practicing.

14 Setting: The questionnaire was distributed via the Royal College of Midwives Facebook page and
15 Twitter account. Invitations to participate were also sent to Heads of Midwifery to distribute to staff.

16 Findings: Three hundred and ninety eight midwives completed the survey. Eighty-two percent of
17 midwives did not use SWI in practice although 69% would consider learning the procedure. There
18 was considerable variation in techniques amongst midwives that did provide SWI. The lack of
19 available practice guidelines and the advice from the National Institute for Health and Care
20 Excellence to not use SWI were cited as the main barriers.

21 Key Conclusions: SWI use is uncommon in the UK although midwives are interested in incorporating
22 the procedure into practice.

23 Implications for practice: National guidance on SWI and the lack of information and training is
24 restricting the use of the procedure in practice, despite SWI being widely used in other countries and
25 being effective in the treatment of pain in labour.

26 Key words: Sterile water injections; Labour; Pain relief; Midwifery practice

27 **Background**

28 Up to 75% of women may experience back pain during labour with 30-45% reporting the pain as
29 both continuous and severe (Melzack & Schaffenberg, 1987; Tzeng & Su, 2008). In a qualitative study
30 of labouring women's experiences of back pain, participants described the sensation as crushing and
31 stated the level of intensity limited their mobility and altered their plans for pain relief (Lee et al.,
32 2015). Back pain is more common in nulliparous women and associated with the latent phase of first
33 stage labour (prior to four centimetres of cervical dilation) (Lee et al., 2013). The intensity of the pain
34 may increase as the labour progresses and early intervention is recommended (Tzeng & Su, 2008).

35 **Managing back pain in labour and the administration of SWI**

36 The literature identifies three non-pharmacological strategies that may be used specifically for the
37 treatment of back pain in labour: acupuncture, transcutaneous nerve stimulation (TENS) and sterile
38 water injections (SWI) (Labrecque et al., 1999; Martensson et al., 2008). Of the three, SWI has been
39 demonstrated to be more effective than either acupuncture (Martensson & Wallin, 1999), TENS or
40 more general non-pharmacological approaches such as massage or water immersion (Labrecque et
41 al., 1999). SWI involves the injection of between 0.1 and 0.5 millilitres (mls) of sterile water into the
42 intradermal or subcutaneous layers of the skin surrounding the lumbar region (Michaelis Rhomboid)
43 of the lower back (Mårtensson et al., 2017). The injections results in a brief but intensely painful
44 sensation followed rapidly by the onset of analgesia which can last for up to two hours; it may be
45 repeated as many times as required (Martensson & Wallin, 2008b). It is theorised that the brief
46 episode of noxious stimulus triggers the body's own pain modulating systems such as the gate
47 control theory, where intense stimulations of competing nerve fibres result in a diminished
48 perception of pain from the slower visceral fibres associated with back pain (Melzack & Wall, 1965).
49 The release of endorphins similar to those demonstrated in Diffuse Noxious Inhibitory Controls may
50 also contribute to the analgesia experienced (Le Bars et al., 1992).

51 Whilst previous systematic reviews and meta-analysis have highlighted the potential of SWI to
52 provide a safe, effective and low technology analgesic option that is suitable for all maternity care
53 settings and models of care (Hutton et al., 2009; Martensson & Wallin, 2008b), the 2012 Cochrane
54 review identified potential issues with the existing evidence and recommends further research to
55 report more clinically relevant outcomes (Derry, Straube, Moore, Hancock & Collins). SWI is
56 frequently used in Scandinavian countries such as Sweden (Martensson & Wallin, 2006) and is
57 becoming increasingly popular amongst midwives in Australia (Lee et al., 2012). However, there is no
58 data regarding the utilisation of SWI by midwives in the United Kingdom (UK), the extent of
59 awareness of the procedure, availability, clinical application or techniques used. The first author has
60 provided assistance to a number of maternity units in the UK in the form of information, training
61 materials and support for clinical governance processes. Some of these maternity units have
62 reported difficulties in introducing SWI due to the very limited availability of information within NHS
63 Maternity Units and resistance from clinical leaders unfamiliar with the procedure. A contributing
64 factor may also be the lack of support for SWI in the National Institute for Health and Care
65 Excellence (NICE): Intrapartum Care guidelines (2014). However, there is no specific data available
66 on the challenges and barriers encountered by practitioners within the UK wanting to introduce SWI.

67 **Methods**

68 **Study Aim and Design**

69 The aim of this study was to describe the knowledge and practice of SWI by UK midwives. The study
70 employed a cross-sectional design via an electronic, internet based survey, adapted from similar
71 surveys conducted in Australia (Lee et al., 2012), Sweden (Martensson & Wallin, 2006) and the USA
72 (Martensson et al., 2008a). The survey was organised into three distinct parts. The first section
73 contained 10 questions collecting demographic data such as age, original midwifery qualification,
74 main area of clinical practice and geographic location. This part was to be completed by all
75 respondents. Then respondents were directed to one of two sections of the survey depending on

76 their response (yes or no) to a question regarding their current use of SWI in practice. Those
77 answering 'No' then completed 11 questions regarding their level of knowledge of SWI, whether
78 they would consider its use in practice, preferences for training and information, what barriers they
79 may or had encountered regarding the introduction of SWI to their workplace and their current
80 management strategies for back pain in labour. Those respondents that indicate current use of SWI
81 were directed to 15 questions regarding use in practice, effectiveness, variations in injection
82 techniques and information supplied to women. Both the latter two sections contained free text
83 areas in some questions for participants to respond with their own experiences and opinions.

84 **Survey Distribution and Participants**

85 We were aiming to reach practicing midwives in the UK (England, Wales, Scotland and Northern
86 Ireland) with current Nursing and Midwifery Council Registration. As the largest professional
87 representative organisation for midwifery in the UK the researchers negotiated with the Royal
88 College of Midwives (RCM) to distribute an electronic link for the survey to the membership. The
89 usual approach by the RCM was to offer research surveys to a random sample of 1000 midwives on
90 the RCM membership email list, however this was not available due to a change in RCM policy
91 governing distribution of external surveys, so an invitation to participate in the survey including the
92 survey internet address was published in the Letters page of the RCM Midwifery Magazine. This
93 approach resulted in only six completed surveys. An invitation to participate and an electronic link to
94 the survey was then posted on the RCM Facebook page (approximately 41,000 followers) and
95 distributed via the RCM Twitter account approx. 29,700 followers). The tweet included a request to
96 retweet (RT) to assist in distribution. Two reminder tweets were sent during the following seven
97 days. At the same time an email containing a link to the survey and an invitation to participate was
98 sent to a number of maternity units (n=156) via the Heads of Midwifery network with a request to
99 distribute to midwifery staff. We have no way of knowing how many people received this invitation
100 or viewed the Facebook and twitter posts.

101 **Ethical and Governance issues**

102 The introductory page of the survey detailed the purpose of the study, the inclusion criteria, and the
103 voluntary nature of participation. However, there was no process for confirming if respondents met
104 the inclusion criteria. There was no formal consent process required, it was considered that if
105 potential respondents followed the link from the introduction to the commencement of the survey
106 this implied an acceptance of the invitation to participate. Ethics approval for the survey was
107 provided by the University of Hull; Faculty of Health and Social Care Research Ethics Committee (Ref.
108 192) and the University of Queensland Human Research Ethics Committee (2015001182). As this
109 low-risk study was a collaboration between researchers at the University of Hull, University of
110 Queensland and Mater Research Institute a three party collaborative research contract with
111 agreement on study indemnity was required, this process took over 12 months to complete.

112 **Sample size and Data analysis**

113 At the time the survey was undertaken the number of midwives registered with the NMC was
114 estimated to be 43,168 including those with both Midwifery and Nursing and/or Specialist
115 Community Public Health Nurses registration. For a representative sample with 95% confidence level
116 and 5% margin of error a total of 381 surveys would be required. Data were analysed using Stata
117 statistical software (StataCorp. 2015. Stata Statistical Software: Release 14. College Station, TX:
118 StataCorp LP). Descriptive statistics were calculated for all variables including percentages, mean,
119 standard deviation, median and range as appropriate. Where missing data occurred due to
120 participants not responding to all questions in the survey, percentages for the actual number of
121 respondents are given. A simple content analysis categorised responses to the open-ended
122 questions.

123 **Findings**

124 Three hundred and ninety eight midwives undertook the survey. A further 23 supplied only
125 demographic data, not responding to the question regarding SWI use, their data were not included

126 in the analysis. Demographic data is presented in Table 1. The majority of respondents were
127 Bachelor of Midwifery graduates (66.2%) and 245 (61.5%) indicated they provided care to women
128 during labour and birth as a regular part of their practice (Table 2).

129 Midwives who use SWI

130 Seventy two (18.0%) midwives responding to the survey used SWI in practice whilst 327 (82.0%) did
131 not. Midwives using SWI tended to be younger, aged between 20 and 50 years compared to those
132 51 years and over. By far England had the most number of midwives using SWI (91.4%), with no
133 midwives in Wales reporting use of the procedure (Table 2). The Southeast of England reported the
134 most midwives using SWI (43.0%) with the East Midlands reporting the least (1.6%). Almost the
135 same number of midwives from tertiary maternity units used SWI (n=34) as those working in district
136 towns (n=37) (Table 2)

137

138 Not unsurprisingly most midwives using SWI worked in a birth setting such as a labour ward (n=42)
139 or Birth Centre (n=12), although midwives working in antenatal / postnatal settings also reported
140 use (n=11) However 29.8% (23/78) also reported encountering resistance to using SWI from
141 midwifery or medical colleagues. Just over half (27/51, 52.9%) indicated they administered SWI
142 frequently or very frequently. All midwives used SWI to relieve back pain, whilst 10% (6/60) also
143 used the procedure for abdominal pain. Participants were asked about the effectiveness of SWI as
144 an analgesic with most (85.9%) indicating they considered SWI to be 'very effective or moderately
145 effective, and 14% as not very or rarely effective. Although fewer midwives (79.2%) considered SWI
146 to be very reliable or moderately reliable and 20.7% as not very or unreliable (Table 3). Midwives
147 also ranked in order of preference the non-pharmacological methods to relieve back pain offered to
148 women. SWI was ranked fourth behind water immersion, massage and transcutaneous nerve
149 stimulation (TENS), but ahead of hot packs, aromatherapy, showers and acupuncture.

150 The survey contained a number of questions regarding techniques used to administer SWI.
151 Respondents were evenly divided (50%/50%, n=52) between the use of either the intradermal or
152 subcutaneous route. However the amount of sterile water used for each individual injection varied
153 between 0.1 – 0.5 ml regardless of the preferred technique. Midwives using the intradermal
154 technique, compared to the subcutaneous administration, were more likely to rate SWI as very
155 effective (21/47, 44.6% vs 14/47, 29.7%) and very reliable (21/47, 44.6% vs 12/47, 25.5%). Four
156 injections were most commonly provided (40/46, 86.9%), four) midwives (4/46, 8.7%) indicated they
157 gave two injections and a single injection was used by only two (2/46, 4.3%).) respondents. Fifty-
158 three percent (25/47) of midwives gave the injections during a contraction with the remainder
159 (22/47, 46.8%) administering the injections between contractions.

160 **Midwives who do not use SWI.**

161 Almost half (49.6% 149/300) of the midwives who indicated that they do not use SWI were also
162 unaware of the procedure as a means of pain relief in labour, this was also reflected in the free text
163 responses (7/16). Of the 151 midwives who had knowledge of SWI 33.8% (51/151) learnt about it
164 from reading a journal article, 27.2% (41/151) from a colleague whereas 11.9% (18/151) had
165 received the information at a conference or study day. Eighteen respondents (11.9%) had learnt
166 about SWI during their midwifery training, seven (4.6%) whilst employed at another hospital, seven
167 (4.6%) from an online source such as a midwifery forum, five (3.3%) from other sources such as own
168 dissertation studies, three respondents did not provide a source. Of the 20 midwives responding to
169 the free text option in this section, four (20%) midwives did indicate that the procedure had been
170 withdrawn from practice at their hospitals:

171 *“Used to use them in practice. Head of midwifery stopped us.”*

172 *“We were taken over by a different trust who did not use SWI and even though we had been supplied
173 with all the research they stopped us from using it until further research was carried out”.*

174 Whilst 69.3% (205/296) of midwives would consider using SWI in practice the remaining 30.7%
175 (91/296) would not. The most common reasons for not using SWI in practice was a lack of support
176 from institution (18.9% 17/90) and the absence of a protocol or guideline (17.8% 16/90). A lack of
177 confidence using the procedure was cited by 14.4% (13/90), and 13.3% (12/90) due to a perceived
178 lack of supporting evidence. In the free text responses 31% (5/16) of participants questioned if the
179 procedure had a placebo effect and was therefore unethical:

180 *“It would be wrong to pretend to give pain relief but only give water”*

181 Whilst others were not supportive of the use of the procedure:

182 *“Barbaric! It might work, but at what cost. Horrendous practice - where is the push for one to one*
183 *care, education and kindness towards women which could help them cope better? Let's just stab*
184 *them ANOTHER needle. Abhorrent practice”.*

185 Of the midwives who would consider using SWI 74% (151/203) indicated that a lack of supporting
186 policy and guidelines was the main barrier to implementation, with a number citing the advice
187 provided by the National Institute for Health and Care excellence (NICE) to not offer women SWI as a
188 significant contributing factor. Not being able to access education materials and training was cited
189 by 10.9% (22/203) and only 1.9% (4/203) stated that resistance from midwifery or medical
190 colleagues contributed to preventing the implementation of SWI. However only nine midwives (3%)
191 reported that their place of work was in the process of introducing SWI with only two respondents
192 indicating this was at the inservice training stage.

193 The majority of midwives not currently using SWI indicated they would like more information about
194 the procedure (86%, 258/300). Information presented in an online resource was ranked as the
195 preferred option followed by workshops, printed resources and a smartphone application.

196 From a practice perspective, midwives not using SWI also ranked water immersion, massage and
197 TENS as preferred options for treating back pain in labour, followed by showers, hotpacks,
198 aromatherapy and acupuncture.

199 **Discussion**

200 To our knowledge this is the first UK wide survey of midwives use of SWI. The results do suggest that
201 the use of SWI in the UK (18%) is far less than that reported in similar surveys from Sweden (91%)
202 (Martensson & Wallin, 2006), the USA (32%) (Martensson et al., 2008a) or Australia (42%) (Lee et al.,
203 2012). This may be the consequence of a lack of support for SWI in the NICE: Intrapartum Care
204 guidelines (2014) as suggested by a number of the respondents. The UK NICE guidelines on
205 Intrapartum Care: care of healthy women and their babies during childbirth, is a prominent source of
206 evidenced based recommendations for clinical practice. The section of the guidelines concerning
207 SWI has not been updated since 2007 when it included two systematic reviews (Huntley et al., 2004;
208 Simkin & Bolding, 2004) to inform their recommendations. Both systematic reviews included the
209 same four trials involving 451 women and both reviews concluded that SWI significantly reduced
210 back pain for 60 to 90 minutes in up to 90% of the women receiving the treatment. Since 2007 two
211 systematic reviews (6 trials) (Fogarty, 2008; Martensson & Wallin, 2008b) and a meta-analysis (8
212 trials n=828) (Hutton et al., 2009) have been published that reported a significant reduction in
213 subjective pain measurements in all reviewed randomised controlled trials. A Cochrane review by
214 Derry et al (2012) (7 trials, n=766) cited previous work by Moore et al (2005) to use a percentage
215 reduction (50% and 30%) in post treatment pain scores as a more clinically relevant benchmark to
216 conduct the review. However as no previous trials had reported in this criteria they concluded that
217 further research was required. A RCT comparing a single to four injections of sterile water in labour
218 (Lee et al., 2013) did report using the criteria recommended by Derry et al (2012) and found that at
219 30 minutes post treatment 87% of participants receiving four injections reported at least a 30%
220 reduction in pain, and 72.8% reported at least a 50% reduction.

221 In 2007 the NICE guidelines on Intrapartum Care (. National Institute for Health and Care Excellence,
222 2007) advised that “The use of injected water papules is not recommended” (Section 5.3.5, p97). In
223 the 2014 edition (. National Institute for Health and Care Excellence) it was stated that the section
224 on SWI, referred to as ‘injected water papules’ had not been reviewed and therefore, in terms of
225 evidence, remained unchanged from 2007, however the recommendation had been changed from
226 ‘not recommended’ to “Do not use injected water papules” (section 8.3.6.4, p333). The 2014
227 guideline states that when the term “must not be used” is provided in relation to a procedure then
228 “the consequences of not following the recommendation could be extremely serious or potentially
229 life threatening” (p106). The guide goes on to say that; “We use similar forms of words (for example,
230 'Do not offer...') when we are confident that an intervention will not be of benefit for most patients”
231 (p106). The use of the term “do not use” would seem to place the advice on SWI somewhere
232 between no benefit for most patients (do not offer) and extremely serious consequences (must not
233 be used). Whilst the NICE guidelines may not be absolute in terms of influencing practice they are
234 likely to have a significant impact on maternity care practice. The NHS Litigation Authority expects
235 health services to address practice standards and risk assessment to reduce insurance liabilities and
236 national clinical guidelines would figure prominently in these processes (Carthey et al., 2011). It is
237 quite plausible then that the language used in the NICE guidance impacts on the hospitals decision
238 to introduce SWI or not, as the survey suggested only a very small number of hospitals were in the
239 process of introducing SWI as a care option.

240 The lack of access to uniform evidence based guidelines was cited by midwives as a significant
241 barrier to the use of SWI in practice. The need for units who have implemented the procedure to
242 develop individual practice guidelines may have resulted in variations in techniques that impact
243 upon efficacy. For example, half of the midwives who use SWI did so using the subcutaneous layer
244 but many also stated they injected less (0.1 – 0.3 most commonly reported) than the 0.5 mls that is
245 usually advised when using this approach (Martensson & Wallin, 1999). The reduced volume of
246 sterile water per injection may decrease the analgesic effect of the subcutaneous route. Midwives in

247 this survey who used the subcutaneous route were less likely to report SWI as being very effective or
248 very reliable compared to those using the intradermal route which does employ volumes of 0.1 – 0.3
249 mls per injection. A randomised controlled trial by Martensson and Wallin (1999) compared the
250 intradermal to the subcutaneous technique and found no difference in analgesic effect measure by
251 visual analogue pain scales or midwives perception of effectiveness. Similarly 47% of respondents
252 reported that they administer the injections between contraction, whereas the Cochrane review
253 (Derry et al., 2012) suggests that administration during a contraction is most commonly used to
254 mitigate the brief but intense pain associated with the injections. A qualitative study of women's
255 experiences of SWI use in labour also reported that this was the preferred approach (Lee et al.,
256 2016).

257 A large proportion (86%) of midwives responding to the survey indicated that they were interested
258 in accessing more information about SWI and that online resources were the preferred format. This
259 is similar to the view expressed by Australian midwives in a 2011 survey of SWI use (Lee et al., 2012).
260 Providing education and training to a large workforce across a 24 hour service with clinical
261 responsibilities competing for time presents challenges for healthcare education (Atreja et al.,
262 2008). Online courses have been shown to be effective in providing continuing education to health
263 care professionals (Liyanagunawardena & Williams, 2014). Suitably tailored online resources have
264 also been demonstrated as acceptable to health care providers irrespective of age, gender or degree
265 of computer literacy (Atreja et al., 2008). This approach has been used successfully to provide SWI
266 training to midwives in the UK and Australia using a web based resource developed by the first
267 author.

268 A small number of midwives in the study expressed the view that the administration of SWI may be
269 unethical as it may only have a placebo effect. As a treatment, a placebo, derived from the Latin 'I
270 shall please', may produce an analgesic effect through altering expectations and conditioning. The
271 placebo effect involves a complex process of interactions between the participant and the clinician

272 which typically begins with a mutual desire for symptom change, perhaps influenced by varying
273 degrees of empathy and reassurance (Finniss et al., 2010). Placebos may produce not only a
274 neurobiological response through the release of endogenous opioids, but have also been
275 demonstrated to reduce neurological activity in pain-sensitive areas of the brain, thereby altering
276 the experience of pain at a physiological level (Wager et al., 2004). The effectiveness of a placebo
277 would, to some extent, rely upon the expectation of the recipient to an effect. In a qualitative study
278 of experiences of using SWI in labour women often reported no real expectation of effect from the
279 procedure as it was 'just water' then expressed surprise when their back pain was relieved (Lee et
280 al., 2016). This would suggest an analgesic effect from SWI that was not reliant upon any
281 preconceived expectations.

282 The study has a number of limitations. The sample is not random and cannot be considered
283 representative of all UK midwives. Also we cannot accurately estimate the proportion of UK
284 midwives who had the opportunity to, and actually did respond. The use of social media for the
285 distribution of the survey may also influence the demographics of the respondents. For example in
286 2016 32% of midwives in England (where 86% of participants reside) were over the age of 50 (Royal
287 College of Midwives, 2016), whereas in this age bracket accounted for 18.1% of respondents. Both
288 Facebook and Twitter usage is much more common in the under 50's age bracket (Duggan &
289 Brenner, 2013). Hence the overrepresentation of the under 50s age group in the sample may
290 overestimate the overall use of SWI amongst UK midwives. It may also be that midwives using SWI
291 were more likely to respond to the survey based on familiarity with the topic.

292

293 **Conclusion**

294 The main findings of the study were that the use of sterile water injections is not common in the UK
295 but there is a desire amongst midwives to learn more about the procedure. The advice provided by
296 the NICE guidelines to 'not use SWI' has limited the availability of the procedure as an analgesic

297 option, however this review is not based on current evidence. The absence of evidence informed
298 practice guidelines in the UK may also have resulted in variations to accepted techniques that could
299 impact on the effectiveness of SWI where it is being offered. Access to online training materials
300 would assist in disseminating a consistent technique that maximise the analgesic effect. The issues
301 encountered in distributing the survey effectively on a national basis highlight the need for support
302 for professional representative organisations to participate in research.

303

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Table 1. Demographic characteristics of midwives participating in the study

Participants	n (%)
<i>Age, years, (n=398)</i>	
20 – 30	113 (28.4)
31 – 40	110 (27.6)
41 – 50	103 (25.9)
51 – 60	65 (16.3)
Over 60	7 (1.8)
<i>Original Midwifery Qualification (n=397)</i>	
Hospital certificate	19 (4.8)
Bachelor of Midwifery	263 (66.2)
Post Nursing registration Midwifery course	109 (27.4)
Masters of Midwifery	6 (1.6)
<i>Employment (n=398)</i>	
Part time	136 (34.2)
Full time	262 (65.8)
<i>Model of care / workplace setting (n=396)</i>	
Alongside midwifery unit	76 (19.4)
Free standing midwifery unit	14 (3.5)
Homebirth	37 (9.3)

Private group practice	2 (0.5)
Private practitioner	5 (1.2)
Obstetric Unit	261 (65.9)
Agency/Contract	1 (0.2)

Years of experience as a midwife (n=397) 12.2 (17.9)

(Mean (SD))

Table 2 Characteristics of midwives using and not using SWI in practice

Participants (n=398)	Midwives using SWI in practice (n=72, 18%)	Midwives not using SWI in practice (n=326, 82.2%)
<i>Main Clinical area</i>	<i>n (%)</i>	<i>n (%)</i>
Antenatal/Postnatal	11 (2.7)	50 (12.6)
Birth Centre	12 (3.0)	33 (8.3)
Community	5 (1.2)	67 (17.0)
Group practice	1 (0.2)	3 (0.8)
Homebirth	0 (0)	3 (0.8)
Independent midwife	0 (0)	4 (1.0)
Labour ward	42 (10.5)	147 (37.0)
Management	1 (0.2)	9 (2.3)
Neonatal Intensive Care Unit	0 (0)	2 (0.5)
Research and Education	0 (0)	5 (1.2)
Specialist Areas		

Age

20-30 years	23 (5.7)	90 (22.6)
31 – 40	24 (6.0)	86 (21.6)
41 – 50	15 (3.7)	88 (22.1)
51 - 60	9 (2.2)	56 (14.0)
Over 60	1 (0.2)	6 (1.5)

Country of the UK

England	62 (15.6)	279 (70.1)
Northern Ireland	3 (0.7)	19 (4.7)
Scotland	3 (0.7)	17 (4.2)
Wales	0	13 (3.2)

Geographical type

City	34 (8.6)	182 (46.0)
Town	37 (9.3)	129 (32.6)
Rural community	1 (0.2)	12 (3.0)

Table 3 Midwives perceived effectiveness and reliability of sterile water injections.

<i>Effectiveness (n=57)</i>	<i>n (%)</i>
Very Effective	37 (64.9)
Moderately effective	12 (21.0)
Not very effective	3 (5.26)
Rarely effective	5 (8.77)
<i>Reliability (n=58)</i>	<i>n (%)</i>
Very reliable	36 (62.0)
Moderately reliable	10 (17.2)
Not very reliable	5 (8.6)
Unreliable	7 (12.0)