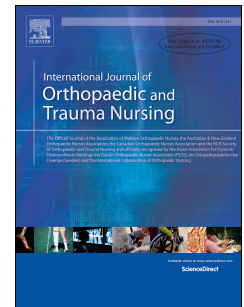# Accepted Manuscript

Orthopaedic nurses' engagement in clinical research; an exploration of ideas, facilitators and challenges

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TITLE PAGE

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1   ABSTRACT

2   Background: Previous international studies have identified individual and

3   organisational barriers to nurses' research utilisation, but there is little data reporting

4   on nurses' engagement in research design and/or delivery, particularly within the

5   orthopaedic speciality.

6   Aim: To explore orthopaedic nurses' views regarding the research priorities for

7   neuro-musculoskeletal care and the perceived barriers and facilitators associated

8   with their engagement in the research process.

9   Methods: A single centre mixed methods study (n=75) collected data via a survey

10   and 14 focus group discussions.

11   Findings: Our sample of clinical orthopaedic nurses showed little evidence of

12   research engagement. Research priorities focused on 1. Understanding and

13   improving patient and staff experiences 2. Improving processes, systems and

14   workload models 3. Interventions to improve clinical outcomes. Key themes arising

15   from the focus group discussion data were research activity, priorities and

16   motivation, culture and leadership, and resources.

17   Conclusion: Our findings suggest that significant work is still required to build

18   sufficient research capacity and capability within the nursing workforce. Key to

19   success will be developing effective leaders, who can create a positive and

20   supportive research culture across an organisation to strengthen the research voice

21   of nursing, which will drive improvements in future care.

22   Keywords: orthopaedic nursing, nursing research, clinical-academic, leadership,

23   barriers, facilitators

24

25 INTRODUCTION

26 Increasing evidence supports that research-active healthcare provider organisations

27 provide better quality care and improved clinical outcomes (Carrick-Sen et al., 2016).

28 Nursing staff, embedded in clinical practice, are in an excellent position to identify

29 questions and design research that matters to patients and families, to the National

30 Health Service (NHS), and to the profession (Carrick-Sen et al., 2016). This paper

31 reports the findings of a study exploring orthopaedic nurses' perspectives of

32 engaging in clinical research.

33 Previous international studies have identified individual and organisational barriers to

34 nurses' research utilisation, including a perceived lack of knowledge, skill,

35 awareness and confidence; support and autonomy; time and exposure (Athanasakis,

36 2013, Breimaier et al., 2011, Duncombe 2018, Kousar et al., 2017, Pericas-Beltran

37 et al., 2014, Sanjari et al., 2015). There is, however, little data reporting on nurses'

38 engagement in research design and/or delivery, particularly within the orthopaedic

39 speciality.

40 BACKGROUND

41 Nurses can engage in research in two key ways. Firstly, as a clinical research nurse,

42 who supports the delivery of high quality research. In England, this includes activities

43 such as recruitment, consent and data collection for large national or international

44 multi-site studies registered on the National Institute of Health Research (NIHR)

45 portfolio. The NIHR have set out a three-year strategy for developing clinical

46 research nursing (Hamer, 2017), focusing on three key areas (table I).

47 The second route is by becoming a clinical-academic. A clinical-academic nurse

48 simultaneously undertakes both clinical practice and research, designing and

49 delivering projects to improve local, national and international practice (Westwood et

50 al., 2018). Despite a published strategy and clinical-academic framework for nurses

51 and allied health care professionals in the United Kingdom (UK) (Carrick-Sen et al.,

52 2016, Department of Health, 2012), outside of a few well-established areas,

53 opportunities are limited and the recruitment and retention of experienced staff

54 remains a challenge (Strickland, 2017).

55 There is a national drive to increase the number of nurses and allied health staff in

56 clinical academic roles by 2030 (Carrick-Sen et al., 2016). Research engagement by

57 clinical nurses is an important precursor to this goal; this paper therefore focuses on

58 embedding research into nurses' everyday practice either as part of their current role

59 or more formally as a clinical academic.

60 Aims and objectives

61 The aim of this study was to explore nurses' views regarding the research priorities

62 for neuro-musculoskeletal care and the perceived barriers and facilitators associated

63 with orthopaedic nurses' engagement in the research process. Key objectives were

64 to:

65 • Identify the extent of nursing research activity

66 • Describe nurses' views of the research priorities for neuro-musculoskeletal

67 care

68 • Explore perceived facilitators and challenges related to orthopaedic nurses'

69 engagement in research

70 METHODS

71 We conducted a single centre mixed methods study at a national specialist

72 orthopaedic hospital NHS trust. Based in London, England, this is the largest

73 orthopaedic trust in the United Kingdom (UK) providing a comprehensive range of

74 neuro-musculoskeletal health care for both adults and children across two sites.

75 The study was exempt from NHS National Research Ethics approval, but approved

76 by a University ethics committee (HSCSEP17/17) and the NHS trust's research and

77 development department. All those who took part gave their written consent.

78 Sample and recruitment

79 We invited all qualified nurses (*n*=373) to complete a questionnaire and take part in a

80 focus group discussion between January-June 2018. Following formal approvals, we

81 sent an email containing a study information sheet to each ward/department head

82 (using the internal email system) to cascade to nurses within their department. We

83 also circulated study information electronically and via posters. Focus groups were

84 organised, either independently or as part of established ward/team meetings for

85 those who registered their interest in participating. All took place on hospital

86 premises.

87 Data collection

88 We used paper-based questionnaires designed by the project team to collect

89 demographic data and to establish the extent of participants' research related

90 activity. Following four questions on demographics (age, gender, grade, job role), the

91 questionnaire consisted of a further five closed questions asking about their

92 academic qualifications, experience of research and future aspirations. A final free

93 text question provided an opportunity for free text comments. Participants completed

94 the anonymised questionnaire immediately prior to the start of the focus group

95 discussion.

96 To explore nurses' research experience, ideas and perceptions of the facilitators and

97 challenges related to research engagement, a single researcher conducted 14

98 audio-recorded focus group discussions lasting 30-60 minutes, each of which had 3-

99 11 participants. We chose to use focus groups as they can provide new insights

100 triggered by the interaction between participants (Krueger and Casey, 2015).

101 Separate focus groups were held for managers to avoid any potential power

102 differences affecting the discussion. A topic guide, focused on three key areas

103 (research experience, research ideas, barriers and facilitators) aided data collection;

104 however, participants were encouraged to explore issues they felt were of relevance.

105 To strengthen internal validity, the design of data collection tools was informed by a

106 review of the literature and the tools were piloted on two allied health professionals;

107 resulting in minor amendments to the wording of the questionnaire.

108   Data analysis

109   Using EXCEL, we performed descriptive statistical analysis (frequencies and

110   percentages) on the data from the 75 completed questionnaires. Qualitative data

111   from the 14 focus groups underwent a standard process of thematic analysis as

112   described by Burnard (2006). Following transcription and initial coding by a single

113   researcher, a second member of the team listened to a sample of the audio

114   recordings against the written notes. Minor differences of opinion in interpretation

115   were easily resolved using a consensus approach to agree final themes. Free text

116   comments from the questionnaire were combined with the focus group findings and

117   key themes from each dataset amalgamated to provide conclusions. Anonymised

118   quotes, highlighting key issues of significance are reported as part of the results.

119   QUESTIONNAIRE RESULTS

120   Seventy-five nurses (20% of population) agreed to participate, roughly half of whom

121   were over 40 (n=42, 56%). The majority were female (n=56, 75%) but there was a

122   good spread of staff from all clinical bands (5-8c) and departments (see table II).

123   Eleven (15%) participants reported no first-degree qualification and only five (7%)

124   declared a postgraduate (master's level) qualification. Respondents' most commonly

125   reported academic aspiration was to study at masters level (n=37, 49%), but some

126   also stated an interest in doctoral level study (n=7, 9%) and/or other academic

127   related activities such as writing for publication (n=12, 16%) and attending (n=23,

128   31%) or presenting at conference (n=13, 17%). However, 11(15%) people also

129   stated that they had no academic aspirations.

130   Twenty (27%) respondents reported a desire to be involved in research and some

131   declared involvement in project work of some kind (n=19, 25%). However, there was

132   little evidence of this work being shared externally, with 65 (87%) reporting never

133   having published in a journal and 46 (61%) never having presented at conference.

134   Free text comments focused on the need to provide adequate resources and funding

135   (n=13, 17%); to have dedicated and backfilled time (n=21, 28%); support and

136 encouragement, (*n*=22, 29%); and the provision of relevant training and education

137 (*n*= 13, 17%).

138 FOCUS GROUP FINDINGS

139 Four key themes arose from the focus group (FG) data. These were research

140 activity, priorities and motivation, culture and leadership, and resources (table III).

141 Research activity

142 Few participants described exposure to research activity. Participants perceived that

143 there was "*lots of surgical research happening*" (FG1), but commented that "*you*

144 *don't hear about it-happens behind closed doors*" (FG1). Instead, they described

145 nurses being more commonly involved in literature reviews and audits, which

146 sometimes led to "*small things…not like research…improvement work*" (FG7).

147 However, few had shared their work externally, as illustrated by one participant who

148 said, "*10,000 words and it's just in the wardrobe and I gave a copy to my mum!*"

149 (FG9).

150 Participants struggled to articulate their research ideas, but suggestions fell into

151 three key areas, detailed in table IV: 1. Understanding and improving patient and

152 staff experiences 2. Improving processes, systems and workload models and 3.

153 Interventions to improve clinical outcomes. Some of these, for example, exploring

154 the role of specialist staff, such as arthroplasty practitioners are specific to

155 orthopaedic practice, but many are applicable to nursing more widely.

156 Priorities and motivation

157 Participants did not consider research to be part of their role, pointing out that it is

158 "*more appropriate for medical staff to have the data-they make the decisions*" (FG3).

159 However, they deemed project work to be relevant to them as it was, "*more tangible-*

160 *better related to day to day nursing*" (FG4). Some participants suggested that it was

161 more important to follow the advice of specialist nurses and local guidelines than to

162 generate research evidence, with one saying: "*don't worry about what the research*

163 *says-just go and get the sister or the doctor*" (FG4). However, this was not a

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164 universally held view, as illustrated by one participant who said, we "*need nurses to*
165 *believe that its not only doctors that do research*" (FG11). Others had just never
166 considered how research might fit with the role of a bedside nurse, but suggested
167 that it should be a mandatory part of revalidation saying, "*I think we should be doing*
168 *it-it is part of our code of conduct*" (FG13).

169 Clinical priorities and the pressure nurses face on a daily basis were described as
170 significant factors affecting their motivation to engage in research. As one participant
171 explained, "*it's something else to do when we are already stretched…We are*
172 *struggling to get the basics done at times…feels like we are being asked to do our*
173 *ordinary care and this and this and this and this… it's never ending*" (FG9).
174 Participants considered shift patterns as part of the problem, stating that long days
175 do not allow for overlap time for discussion or project work: "*Come to work, do your*
176 *job that's it-the idea of doing something on top is too much…Long days take up*
177 *everything...close together-so burnt out and too many personal things to sort. Short*
178 *shifts… I found them beneficial, there was overlap time*" (FG5).

179 Discussions emphasised the importance of personal motivation, with participants
180 stating that you "*need to find people who are really interested in research-not us…it*
181 *doesn't bring me any joy… I'm a nurse not a researcher*" (FG7). Participants also
182 described the need to recognise and reward peoples' efforts, because you "*need*
183 *something to drive them…you need a reward*" (FG6). Previous experience also
184 influenced peoples' motivations toward research. For example, one participant
185 explained that it "*wasn't really sold to me in my nurse training, it was just really dull,*
186 *you had to just grit your teeth and do it*" (FG7). These experiences had a long-term
187 effect on some to the point where, "*when you hear the word research everyone's*
188 *heckles go up*" (FG7).

189 Participants discussed the need to engage nurses at the early stage of their career,
190 saying it "*needs to be part of your working life from the beginning*" (FG12). A
191 perceived lack of confidence and competence were key barriers to participants'
192 desire to engage in research, often underpinned by a lack of knowledge. Participants
193 described research as "*like tasting a nasty medicine-you know it will do you good*
194 *but…*" (FG4). They expressed fears around the language used, with some put off

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195 because "*research sounds scary and words are scary*" (FG5). Some participants had

196 never received any research training, particularly if they qualified some time ago and

197 academic ability was seen as a particular barrier for international nurses, one of

198 whom said, "*I can't do research, I didn't do my studies here, I don't feel confident,*

199 *English is my second language. I can help but…*" (FG7).

200 Culture and leadership

201 The importance of effective clinical and research leadership, and the need to make

202 research part of the normal work culture was emphasised throughout the

203 discussions. Participants described feelings of disempowerment and a lack of

204 support; factors which inhibited their desire to engage. One participant pointed out

205 that it is "*hard for nurses to come up with something as ideas get carpeted. You are*

206 *too junior, you are a student, what do you know?*" (FG6). Participants also described

207 wanting to decide themselves what to implement rather than it coming from top

208 down, wanting to feel listened to, and valued.

209 Discussions highlighted the need for "*buy in from the senior team…*" (FG8). One

210 participant pointed out that "*it's one thing to have these opportunities but it is another*

211 *to be proactively encouraged to do it*" (FG14). Others described how their appraisal

212 had helped them to think about how they might take research forward as part of their

213 career plans, although pointed out that the this depended on the appraiser stating*,*

214 *"appraisal could be an effective mechanism, if done the right way*" (FG8).

215 Participants highlighted the importance of developing a culture of encouraging

216 curiosity. They acknowledged the value of, for example research champions and

217 newsletters to raise awareness of opportunities, and of forums such as journal clubs

218 and local project groups, where ideas can be shared and supported. The need for

219 research staff to have a visible presence and for role modelling and shadowing

220 opportunities was also described as important because, "*just for us to observe,*

221 *shadowing how others do it enhances the knowledge and confidence*" (FG10).

222 Participants also wanted opportunities to share and learn from each other, for

223 example at internal and external conferences.

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224 Resources

225 The need for designated protected and backfilled time for research and innovation
226 activity was strongly supported in all discussions. Participants perceived that "*other*
227 *disciplines have protected time and nurses don't-so nursing research falls*
228 *down…You have to go through millions of hoops to get anything-medics have time,*
229 *money and support-nurses have nothing*" (FG14).

230 Participants highlighted the importance of a flexible approach, using resources to
231 demystify research and to help people turn ideas into projects. They wanted 'user
232 friendly' workshops and action learning sets, which led to some form of output, such
233 as a presentation or publication. Participants also described not knowing where to
234 start saying, "*I don't know who to approach…we don't know who are the research*
235 *team*" (FG8) and wanted processes to be "*as simple and practical as*
236 *possible…simple ABCD…that's what I would need*" (FG9). Signposting and buddy
237 systems were also identified as important as it would be "*nice to know there is*
238 *someone to go to for help and advice*" (FG6).

239 Finally, participants stressed that financial resources need to be committed to
240 support research engagement, for funding to undertake academic study, to support
241 staff release and for the provision of facilities to support research activity, such as
242 employing research advisors and statisticians.

243 DISCUSSION

244 The aim of this study was to explore nurses' views regarding the research priorities
245 for neuro-musculoskeletal care and the perceived barriers and facilitators associated
246 with orthopaedic nurses' engagement in the research process. Overall findings
247 suggest that, despite some acknowledgement of its importance for improving health
248 outcomes and patient experience, there remain significant barriers to achieving
249 effective engagement and to changing nurses' attitudes towards clinical academia.

250 Positive attitudes are associated with increased overall research utilisation (Squires
251 et al., 2017). The nurses we studied generally reported poor motivation towards
252 research engagement and there was little evidence of research activity. The only

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253 other published study conducted in an orthopaedic setting, reported that their

254 participants (*n*=43) were motivated towards both conducting and using research

255 (Berthelsen and Hølge-Hazelton 2015). Studies conducted with nurses working in a

256 range of other clinical settings have also reported increasingly positive attitudes

257 towards research (Akerjordet et al. 2012a). However, all these studies were

258 conducted in Scandinavia using descriptive cross-sectional surveys. In contrast, our

259 mixed methods approach provided opportunity for participants to discuss and explain

260 their views and experiences related to research engagement specifically within the

261 NHS.

262 Our findings emphasise the importance of effective, visible leadership to create a

263 positive and supportive research culture, supporting the view of NHS improvement

264 (2017). It is important to recognise the contribution line managers play in embedding

265 research into someone's career aspirations via appraisal and promotion

266 mechanisms, and through supporting opportunities for involvement. As identified by

267 some of our participants, however, the effectiveness of this process depends on the

268 skills and motivation of those in leadership and management positions. Providing

269 opportunities to learn how best to support and develop the research capability and

270 capacity of others should be included in every leadership programme. This is

271 particularly important considering that many senior staff may themselves not have

272 been exposed to research during their training and clinical practice, and thus can feel

273 unsure about how best to support the development of others. In our study, specialist

274 nurses were identified as key sources of practice guidance, suggesting that they may

275 have an important role in helping to develop a research culture.

276 Fifteen percent of our sample did not have a first degree and few reported

277 postgraduate qualifications. Furthermore, our qualitative data support that nurses

278 often lack the required theoretical and/or practical research knowledge. Berthelsen

279 and Hølge-Hazelton (2015) also noted a lack of confidence from their participants

280 around how to conduct research, supported by older qualitative data published by

281 Roxburgh (2006), which also suggest that nurses have limited knowledge and skills

282 related to the research process.

283   Our findings are congruent with the views of other authors (Masterson and Rob,

284   2016, Westwood et al., 2018) highlighting the importance of formal academic

285   pathways and effective collaborations with higher education institutions. However,

286   despite 44% of the nurses surveyed by Akerjordet et al. (2012a) holding a bachelor's

287   degree, they still reported a low degree of theoretical and practical research

288   knowledge. This highlights the need for nurses to obtain postgraduate qualifications,

289   which provide more opportunities to explore and engage in research activities. Our

290   findings further highlight the necessity for flexible and practical training and

291   education and, similarly to Akerjordet et al. (2012a), the value of small group

292   workshops to support skill development.

293   Our findings suggest that exposing nurses to research may help them to develop a

294   more curious approach to their own practice, increasing their motivation towards

295   research engagement. Team working, as opposed to working in isolation and

296   developing effective partnerships across all level of the organisation and professional

297   groups is important for success, as noted in the case study paper published by

298   Westwood et al. (2018). Our local organisational structure consists of four deputy

299   directors of research (representing nursing, therapies and medicine) working

300   together to provide strategic research leadership. However, this model of

301   collaborative working needs to be replicated in clinical teams across the wider

302   organisation.

303   Time was a key barrier to research engagement identified from our study. As

304   reported by others (Akerjordet et al., 2012a, Roxburgh, 2006), the lack of time

305   available to be creative and the need to address other clinical priorities negatively

306   affects peoples' desire and ability to engage in research. We also found that shift

307   patterns can be a hindering factor, a finding supported by Roxburgh (2006),

308   highlighting the pressures of working full time and the impact that this can have on

309   work-life balance. This is an important consideration given the concern around

310   resilience and burnout in nurses working in today's resource constrained healthcare

311   system. Statistics suggest that there are currently over 40,000 nursing vacancies in

312   England (NHSI, 2018). If handled correctly, offering wider opportunities and a

313   broader scope of practice could act as both a recruitment and retention tool.

314 Many of the research challenges we identified in our study are not unique to

315 orthopaedic nursing (Carrick-Sen et al., 2016), suggesting that a strategy for

316 engaging nurses working in neuro-musculoskeletal settings can be informed by data

317 from other practice areas and vice versa. Importantly, however, our study has

318 identified orthopaedic nurses' views about research priorities to improve neuro-

319 musculoskeletal health outcomes and patient and staff experience.

320 STUDY LIMITATIONS

321 This small single centre exploratory study was designed primarily to inform a local

322 nursing research strategy, thus inferential statistics were not utilised. A single

323 researcher conducted all focus group discussions, however, other members of the

324 research team checked final codes and themes and findings have resonance with

325 those of other authors, adding to their credibility.

326 CONCLUSIONS

327 The aim of this study was to explore orthopaedic nurses' views regarding the

328 research priorities for neuro-musculoskeletal care and the perceived barriers and

329 facilitators associated with nurses' engagement in the research process. Our findings

330 contribute to the limited body of evidence in the field. They will support the clinical-

331 academic development of orthopaedic nurses and promote research, which

332 addresses nursing sensitive outcomes for people with neuro-musculoskeletal

333 disorders.

334 There is still significant work to do to build sufficient research capability and capacity

335 within the nursing workforce. It is not easy to change the traditional culture, in which

336 research is not viewed as part of nursing; by nurses or the rest of the multi-

337 disciplinary team. Key to our success will be developing effective leaders, who can

338 create a positive and supportive research culture across the organisation. These

339 leaders must work collaboratively to address the research resource and education

340 needs of nursing staff and to strengthen the research voice of nursing, which will

341 drive improvements in future care.

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Table III: Research priorities

Key area	Research areas	Example questions
Understanding and improving patient and staff experiences	- Staff recruitment and retention - Staff wellbeing - Training and education - Patient and family engagement	- What makes nurses stay or leave the world of orthopaedic nursing? - How can we engage older people in rehabilitation innovations?
Improving processes, systems and workload models	- Leadership - Multidisciplinary communication - Culture and behaviour change; admission, discharge and length of stay - Role and impact of specialist nurses, length of stay	- Information giving to families whose children undergoing amputation- where are the gaps and how can they be filled? - What is the future role of the Arthroplasty Practitioner?
Interventions to improve clinical outcomes	- End of life - Pain and anxiety - Infection control - Tissue viability - Use of technology - Evaluating tools adapted for specialist practice	- Pre-operative anxiety; evaluating the impact of the COPE tool - What non-pharmacological approaches might reduce chronic pain in patients with neuro-musculoskeletal disorders?

Table II: Themes and subthemes

Research activity	Priorities and motivation	Culture and Leadership	Resources
Not part of the job	Perceptions	Role modelling	Competence and confidence
Other people do it	Unpleasant and scary	Career development	Time and resources
Research ideas	Previous experience	Support, value and empowerment	Knowledge and understanding
Personal interests	Where to start	Curiosity	Training
	Professional responsibility	Opportunities and exposure	Flexibility

Table I: Demographic details of participants

Domain	Category	*n* (%)
Age	< 25 years	2 (3)
	26- 40 years	28 (37)
	> 40 years	42 (56)
	Missing data	3 (4)
Gender	Female	56 (75)
	Male	15 (20)
	Missing data	4 (5)
Level of experience (Band 5: Junior- Band 8-Senior)	Band 5 (Staff nurse)	25 (34)
	Band 6 (Sister/charge nurse)	19 (25)
	Band 7 (Senior sister/ward manager/ specialist nurse)	16 (21)
	Band 8 or above (Consultant nurse/Head of nursing)	10 (13)
	Other/Missing data	5 (7)
Role	Bedside/theatre nurse	34 (45)
	Ward/department manager	8 (11)
	Clinical nurse specialist/lead nurse	15 (20)
	Divisional head of nursing	4 (5)
	Other/missing data	14 (19)

Ethical statement/financial disclosure

The study was exempt from NHS National Research Ethics approval, but approved by a University ethics committee (HSCSEP17/17) and the NHS trust's research and development department. All those who took part gave their written consent.

We received no financial support for this study

Box I: Clinical research nursing: strategic aims (Hamer, 2017)

- Creating a clinical research culture that is patient and public focused
- Promoting innovation in research delivery practice to include the use of digital technologies
- Improving awareness and understanding of the specialty of clinical research nursing and its contribution and impact
- Developing leaders to share best clinical research nursing practice locally, nationally and internationally