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**Article:**

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1 Title page:

2 Title: Systematic mixed studies review and thematic synthesis of Emergency Department staff'  
3 perceptions of enablers and barriers to pain management.

4 Short running title: ED pain management review

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18

19 Abstract and keywords:

20 Introduction

21 Pain is the most common presenting feature within the Emergency Department (ED), yet under-  
22 treatment of pain in the ED is a well-documented problem worldwide. Despite the development of  
23 interventions to address this problem, there is still limited understanding of how pain management  
24 can be improved within the ED. This systematic mixed studies review aims to identify and critically  
25 synthesise research exploring staff views of barriers and enablers to pain management to  
26 understand why pain continues to be under-treated in the ED.

27 Methods

28 We systematically searched five databases for qualitative, quantitative and mixed methods studies  
29 reporting ED staff views of barriers and enablers to pain management in the ED. Studies were quality  
30 assessed using the Mixed Methods Appraisal Tool. Data were extracted and qualitative themes were  
31 generated by deconstructing data then developing interpretative themes. Data was analysed using  
32 convergent qualitative synthesis design.

33 Results

34 We identified 15,297 articles for title/abstract review, reviewed 138 and included 24 in the results.  
35 Studies were not excluded due to low quality, although lower scoring studies contributed less data  
36 to the analysis. Quantitative surveys focused more on environmental factors (e.g. high workload and  
37 bureaucratic restrictions) while qualitative studies revealed more insight about attitudes. We  
38 developed five interpretative themes from the thematic synthesis: 1) Pain management is seen as  
39 important but not a clinical priority 2) Staff do not recognise the need to improve pain management  
40 3) The ED environment makes it difficult to improve pain management 4) Pain management is based  
41 upon experience, not knowledge 5) Staff lack trust in the patient's ability to judge pain or manage it  
42 appropriately.

43

44 Conclusions

45 Overly focussing on environmental barriers as principal barriers to pain management may mask  
46 underlying beliefs that hinder improvements. Improving feedback on performance and addressing  
47 these beliefs may enable staff to understand how to prioritise pain management.

48 Keywords: pain management, systematic mixed studies review, qualitative synthesis

49

50

51 **What is already known on this subject**

- 52 • Pain management within the ED is poorly managed. Reasons for this are complex and under-  
53 researched.
- 54 • Studies of staff views of barriers to pain management suggest a wide range of factors that  
55 influence how pain is managed, with quantitative surveys focusing on pre-conceived, non-  
56 modifiable barriers such as time and workload pressures.

57

58 **What this study adds**

- 59 • This synthesis of quantitative and qualitative studies found that whilst quantitative studies  
60 focus on non-modifiable barriers to pain management (e.g. organisational barriers) ,  
61 qualitative studies indicated other modifiable barriers to pain management such as  
62 motivation to change, prioritization and knowledge and training.

63

64 **How this study might affect research, practice or policy**

- 65 • A clearer understanding of the range of barriers to pain management may help EDs address  
66 barriers to inadequate pain management by focusing on modifiable factors.
- 67 • Research exploring staff views needs to incorporate qualitative measures in order not to  
68 limit understanding of issues explored.

69

70 Why is pain management so difficult in the Emergency Department? A systematic mixed studies  
71 review and thematic synthesis of staff perceptions of enablers and barriers to pain management  
72 within the Emergency Department.

### 73 Introduction

74 Pain is the most common presenting feature within the Emergency Department (ED) yet under-  
75 treatment of pain is a well-documented problem worldwide (1-5). Comprehensive guidelines to  
76 assist with the management of acute pain in the ED exist, along with various effective  
77 pharmacological and non-pharmacological treatment to reduce pain that can be administered within  
78 EDs (6-10). However, evidence continues to show under-prescribing and delays to analgesia for  
79 patients with painful conditions. Recent empirical research, editorials and opinion pieces have  
80 suggested various underlying reasons for poor pain management, including poor alignment of pain  
81 management with ED processes and structures, high workload, difficulties in assessing and  
82 reassessing pain, reluctance to prescribe opioids, poor staff knowledge and unrealistic patient  
83 expectations (11-17). Pain management guidelines reference a need for further research in this area  
84 (6).

85 Whilst barriers to pain management are well known within other settings, the ED setting has a  
86 unique combination of organisational characteristics, which means that context-specific research  
87 into this area is essential (18). Understanding staff perceptions can reveal why interventions aimed  
88 at improving pain management appear to have limited success (19) and enable more effective  
89 interventions to pain management to be developed.

90 This systematic review aims to identify literature reporting staff perceptions of barriers and enablers  
91 to pain management in the ED and to synthesize the evidence to improve our understanding of  
92 modifiable and non-modifiable barriers and enablers to pain management.

### 93 **Methods**

94 We undertook a systematic mixed studies review and thematic synthesis of the published literature  
95 to identify staff perceptions of barriers and enablers to pain management in the ED. We followed  
96 the PRISMA checklist where applicable.

#### 97 Search strategy.

98 We carried out a comprehensive two-stage literature search. Firstly, a broad and sensitive literature  
99 search was conducted with one reviewer (FS) initially screening articles by title and abstract to  
100 identify articles that potentially related to barriers or enablers to pain management in the ED. The  
101 broad search strategy was developed from a previous systematic review (19). Both authors reviewed  
102 this list against the selection criteria to select relevant articles and resolved disagreements about  
103 inclusion by discussion. (See appendix).

104 We searched the following databases in May 2016 (updated in October 2022): Medline (via Ovid),  
105 Embase (via Ovid), Cinahl (EBSCO), Web of Science, Cochrane central register of controlled trials. We  
106 also searched Opengrey (previously SIGLE) and Health Management Information Consortium for  
107 grey literature to identify peer-reviewed articles by authors of MSc or PhD dissertations that may  
108 have been missed within the database searches. No limits were placed on year of publication or

109 language. We also searched reference lists of reviews of pain management in EDs and reference lists  
110 of all included studies.

#### 111 Study selection and inclusion criteria

112 We included any original research that reported data on staff perceptions of enablers or barriers to  
113 pain management within the ED. Studies were categorized as those that used naturalistic methods  
114 (qualitative studies using observation or open or semi-structured questions to elicit opinions from  
115 staff) and those that used a pre-defined set of questions to obtain staff or patient opinions about  
116 enablers and barriers to pain management in the ED (quantitative studies). Studies were excluded if  
117 they were based solely outside the ED (e.g. prehospital only, post-discharge) or if they related solely  
118 to procedural pain. We included research from any country and also included any ED pain  
119 population (e.g. paediatric, trauma etc.).

#### 120 Quality assessment.

121 Assessment of risk of bias and quality of studies was undertaken by both authors using the 2011  
122 McGill Mixed Methods Appraisal Tool (MMAT), which allows for critical appraisal of qualitative,  
123 quantitative and mixed methods studies (20).

#### 124 Data extraction

125 Data from the results and discussion sections of qualitative studies were extracted independently by  
126 both authors and charted in MS Excel. Whilst all data (original participants' quotes and author's  
127 analysis) was used in the analysis, we report only original quotations to illustrate our findings. Data  
128 from qualitative studies were deconstructed into descriptive themes and reconstructed into  
129 interpretative themes, as described by Harden et al. (21).

130 Quantitative data came exclusively from observational data (surveys). Studies reporting Tanabe &  
131 Buschmann's questions (22) were tabulated. For other studies, the top 5 barriers and enablers were  
132 documented and the researcher's interpretations and conclusions about the results were  
133 summarised.

134 (See table 1 in supplementary material)

#### 135 Research team and reflexivity

136 FS is a Health Services Researcher, with 20 years' experience of pragmatic health services research.  
137 MJ is a qualified Oncology nurse and was working in Public Health research at the time of the review.  
138 Neither have worked in the ED, so preconceptions around barriers and enablers were minimised,  
139 although FS was undertaking fieldwork into barriers and enablers to pain management concurrently  
140 in three UK EDs concurrently when undertaking the review. Articles written by either author were  
141 excluded from the evidence synthesis.

#### 142 Patient and Public Involvement (PPI)

143 We did not consult with our PPI group due to this being a secondary review.

#### 144 Data synthesis

145 Data was analysed using a convergent qualitative synthesis design described by Pluye et al (23). As  
146 there were no a priori theories of barriers and enablers developed, inductive coding was developed  
147 and thematic synthesis was used. FS and MJ read and re-read the qualitative data to understand the  
148 analytic meanings behind the data and developed themes which were then discussed and refined.  
149 Due to significant heterogeneity in the questions asked, narrative summaries of data from cross-  
150 sectional studies were developed (qualitizing the data), and the narratives were used to develop the  
151 themes. Qualitizing data involves finding an underlying qualitative representation of the quantitative  
152 data items. In this instance, the results of the different questions were interpreted and mapped  
153 alongside the qualitative findings. For example, high levels of agreement that 'lack of time to  
154 adequately assess and control pain' was a barrier was mapped onto the theme 'culture/context',  
155 subtheme 'Busy, noisy, pressurised environment with heavy workload, surges in demand and wide  
156 range of tasks that take up staff time'). The descriptive themes were analysed and discussed and the  
157 authors developed analytic themes, or inferred barriers which emerged as important in considering  
158 future intervention development (24, 25).

## 159 Results

160 The broad literature search identified 15,297 articles, once duplicates were removed. From these,  
161 151 articles were identified as potentially including data on ED staff views regarding pain  
162 management and double-screened (by FS and MJ). Literature results are detailed in the Prisma flow  
163 diagram (Figure 1).

164

165 One study was available in abstract only and excluded due to limited results (26). We also excluded  
166 two articles published by one author of this current review prior to assessment for eligibility (one of  
167 which would have been eligible) due to concerns that the analysis may be influenced by that  
168 author's in-depth understanding of the data within that study and privilege the results of that study  
169 (16, 17). A total of 24 articles were analysed. Twelve studies used qualitative methods (14, 15, 27-36)  
170 Twelve articles reported quantitative surveys of barriers to pain management, four of which used  
171 the same survey questions of ED nurses, or a modified version of the survey questions reported by  
172 Tanabe & Buschmann 2000 (22, 37-47). The remaining four articles reported physician responses to  
173 a predefined list of potential barriers to pain management. The grey literature search identified 2  
174 dissertations (48, 49) which we did not include within our analysis, although we searched for  
175 published articles by the authors.

176 Due to differences in outcome measures reported (see supplementary table 2) we did not combine  
177 responses across surveys. The surveys are discussed narratively, in relation to the themes identified  
178 within the qualitative surveys.

179 Study characteristics and summary of relevant findings are reported in the supplementary material  
180 (supplementary table 1). Only 4 of the qualitative studies specifically addressed enablers and  
181 barriers to pain management as the primary research question (2 from Australia, 1 Netherlands, 1  
182 USA) with other included studies reporting barriers and enablers as part of broader studies (e.g.  
183 nurse perceptions of assessing pain). Qualitative studies incorporated focus groups and interviews  
184 (or a mixture), with one including documentary analysis and another including participant  
185 observation. Included articles were from North America (8), Australasia (6), Europe (5), Africa (3),  
186 Asia (2).

187 Quality assessment.

188 Results of the MMAT assessment are shown in Table 1. Quality of studies was lower for the  
189 quantitative descriptive studies than the qualitative studies. The lower scoring studies provided  
190 fewer details about the study methods and generally provided less data to contribute to the analysis.  
191 However, they were not excluded based upon their quality score as they offered some insight into  
192 the barriers and enablers to pain management. Study weaknesses are instead discussed within the  
193 narrative.

194 Themes

195 Data were organised into descriptive themes (table 2) and developed into five interpretive themes.

196

197 1) Pain management is seen as important but not a clinical priority.

198 Staff described an ED culture which prioritises dealing with 'sick' (27) people, with pain management  
199 portrayed as a non-essential task that may be more likely to be prioritised if useful in expediting  
200 diagnosis, particularly when diagnosis was seen as key to management (14, 15, 35). Staff asserted  
201 the need to prioritise 'what kills' first (14), with pain management not defined as a clinical priority,  
202 particularly chronic or other non-acute pain (27, 30, 36).

203 *"I don't necessarily see back pain as a priority compared to [...] other things that come in."*  
204 *(Emergency Nurse, 36).*

205 Pain management was described as something that can be achieved only when other 'essential'  
206 tasks have been performed. Given the focus on moving patients quickly out of the department, the  
207 time required to adequately assess patients (particularly those with chronic pain), obtain analgesia  
208 and reassess pain was seen as prohibitive (32, 33)

209 The ED was described as 'saturated' (32) with patients in pain, leading to staff becoming desensitised  
210 to pain and normalising rather than prioritising pain, (27) which was seen as 'part of the deal' (14) .

211 *"One of our main barriers has been burnt out staff with lack of empathy for patients, and I think*  
212 *that's universal among both medical and nursing staff, who've seen a lot of it and are working under*  
213 *big pressures, and pain management is just one too many things for them and they don't have*  
214 *enough empathy to see the pain and address it quickly."* *(Role not reported, 32)*

215 At an organisational level, the ED is driven by targets on waiting times and other key performance  
216 indicators that are prioritised over quality indicators such as pain management (15).

217 *"You just have to prioritize. I mean a cardiac red [arrest] comes before pain medication"* *(Role not*  
218 *reported, 27)*

219 *"We are here to find a diagnosis and move them on"* *(Emergency doctor, 15)*

220 Quantitative survey themes of 'responsibility of caring for other acutely ill patients in addition to a  
221 patient with pain' and 'lack of time to adequately assess and control pain' support this theme and  
222 were in the top 4 barriers within each study reporting these themes.

223 2) Staff do not believe there is a need to improve pain management.

224 Although there was some awareness that patients were not receiving optimal pain management (15,  
225 28, 35) there did not appear to be a strong belief in the need for change. Some interviewees  
226 reported that staff, particularly doctors, have a high level of confidence in their own abilities and  
227 assumed that current practice was appropriate. Alongside this self-confidence was a lack of  
228 protocols and guidance, (or a lack of awareness of existing protocols and guidance) so staff were not  
229 aware of the level of best practice that they should be achieving. A need to recognise deficiencies in  
230 existing practice through feedback (e.g. audit) was seen as an enabler to change in practice.

231 *“Everyone thought they were doing a good job. And they were very, very surprised to see that they*  
232 *were actually doing so badly.” (Role not reported, 32).*

233 This lack of conviction of a need to change appears to be confounded by a lack of shared aim or  
234 ‘ownership’ of pain management between different staff groups and confusion over key roles (34),  
235 with a suggestion that doctors pass the responsibility on to nurses, whilst nurses have to rely on  
236 doctors to prescribe (27, 28).

237 *“We [the nurses] are really at the mercy of what the physician wants to do. Sometimes it’s easy to*  
238 *get orders and sometimes you can’t get orders from them. The nurse is really powerless.” (Nurse, 27)*

239 The presence of a champion within the ED to own and drive forward improvement in pain  
240 management was seen as an enabler, along with buy-in for change from the whole team (14, 15, 27,  
241 32).

242 3) The chaotic ED environment and staff role limitations makes it difficult to  
243 improve pain management

244 Staff described a working environment in which change or improvement was difficult, with policies  
245 and procedures that ran counter to providing good pain management (27, 35). Staff across all  
246 studies reported the ED environment and surges in demand as a significant barrier, with staff  
247 working in a busy, noisy pressurised environment with heavy workload, and a wide range of tasks  
248 that take up staff time (14, 15, 27, 28, 31, 35).

249 *“Don’t have time to get pain scores or analgesia” (Role not reported, 32)*

250 *ED overcrowding...it’s a problem to do reassessments in triage; the waiting room area is also a*  
251 *challenge because there’s usually such a large volume of people you can’t reassess as properly as*  
252 *you’d like to (Nurse, 31)*

253 Cross-sectional quantitative studies in particular focussed largely on barriers that were inherently  
254 outside the control of staff, such as ‘lack of time to adequately assess and control pain’ and  
255 ‘responsibility of caring for other acutely ill patients in addition to a patient with pain’ (22, 37-39).  
256 Departments were described as working at above capacity and bed-blocking led to nurses having to  
257 deal with higher number of patients than they could realistically deal with, leaving them feeling  
258 overwhelmed (27). One study highlighted how violent and abusive patients in particular detract from  
259 good pain management (34). Respondents describe the environment as prohibitive to achieving  
260 ‘best practice’ and the lack of time available to deal with patients as counter to effecting change.

261 *“When you are battling to keep your head above water it’s very hard to aim for excellence”*  
262 *(Emergency Doctor, 15)*

263 Other organisational factors such as opiate protocols requiring physician sign-off and high junior  
264 doctor turnaround were seen as barriers to sustaining any attempts to change. A need for improved

265 teamwork, communication and collaboration between team members (particularly between staff  
266 working within the ED and management) emerged as a barrier particularly within the qualitative  
267 studies (14, 27, 32, 35). In particular, nurse-initiated analgesia was seen as an enabler to improving  
268 pain management as it removed the need to await physician prescription. An increase in nursing  
269 responsibilities was seen as beneficial, although this was not always recognised by patients (28, 35).

270 *I know that nurses are now much [more] respected than before but physician dominance of [pain*  
271 *management] is common and [appreciated] by patients! [Smiling]...when the ED patient [steps in]*  
272 *he/she asks for only a physician to assess his/her pain. It is like we know nothing in [pain*  
273 *management]. (Nurse, 34)*

274 *“the vast majority of patients that we’d have come through could have the pain treated effectively*  
275 *with the nurse” (Role not reported, 28)*

276

277 4) Pain management is based upon experience, not knowledge

278 Pain management in practice was reported to be based more on expert opinion rather than pain  
279 protocols, with knowledge and practices passed on from senior to junior staff (14, 15, 32). Despite  
280 reporting high levels of confidence in their own pain management practice, knowledge deficits about  
281 pain management principles were reported as a barrier (14). Staff revealed a desire for specific  
282 knowledge around various aspects of pain management (e.g. physiology of pain, knowledge about  
283 consequences of inadequate pain management, knowledge of side-effects and use of pain scales)  
284 that would enable them to counter unfounded myths (14, 32).

285 *“The old surgical myth of don’t give pain relief to a surgical patient awaiting surgical review in case*  
286 *you hide the symptoms... and also the myth about worrying about whether or not patients will*  
287 *become dependent on opioids” (Role not reported, 32)*

288 Education and training was highlighted as an enabler along with knowledge of research and evidence  
289 (11, 32, 38) particularly given the high turnover of staff within the ED. Staff experience was also felt  
290 to be an enabler (14, 29), giving staff confidence, but may be a barrier when nursing staff rely on  
291 medical staff due to the high turnover of lower grade medical staff.

292 *“I feel fairly confident, but I have been doing this for a while, you can kind of understand. But I feel*  
293 *confident to go up to the doctor and say this isn’t working, we need to give some more pain killers –*  
294 *what do you suggest or here are my suggestions. So I feel confident in doing that and treating the*  
295 *patient with pain. Maybe 9/10 but we are all senior nurses and have been on the floor for a while”*  
296 *(Nurse, 29)*

297 *All of our medical staff have got such a high rotation we have internal residents they’re really in the*  
298 *department for 10 weeks all we can really try and do is make them competent (Emergency Doctor,*  
299 *15)*

300 The lack of clear protocols and guidelines was also felt to reinforce the culture of learning through  
301 peer experience rather than evidence-based learning (14). A need to demonstrate ‘proof of  
302 effectiveness’ (26) for interventions was seen as an enabler to changing attitudes towards pain  
303 management (15).

304 Quantitative studies reported inadequate staff knowledge of pain management principles within the  
305 top half of the rankings with one exception (37). The need for education about pain management  
306 principles and training on use of guidelines were highlighted as potential enablers (38).

307 5) Staff lack trust in the patient's ability to judge pain or manage it appropriately

308 Staff revealed they had more confidence in their own ability to estimate patient pain levels than the  
309 patient (14, 28, 31, 32). Staff expressed doubt about the utility of pain scores, undertaking scoring  
310 because it was mandated rather than because they believed they were useful (27). Staff reported  
311 that patients' pain scores cannot be believed, partly due to a lack of patient understanding of how  
312 scoring works, communication difficulties or dementia (31), but also due to a feeling that patients  
313 manipulate the scores due to expectations of pain relief or drug seeking behaviour (14, 27).

314

315 *A patient with a broken wrist gives a pain score of ten. All right, you should not generalise but a pain*  
316 *score of ten gets triage code orange [very urgent]. Naturally that never happens. These patients*  
317 *mostly get the yellow code [urgent]. (Triage nurse, 14)*

318 *The more you're there, the more they are being like, what we call dramatic. But when you walk away*  
319 *and no-one's around, they're fine. (Role not reported, 30)*

320 Staff appeared to rely on their own judgement and 'visible signs' of pain (31) than patient reported  
321 scores, particularly where the pain score would increase the urgency of the triage category (14).  
322 There was a perception that relying on their own nursing or medical experience was a more accurate  
323 measure of pain levels than the use of validated patient reported pain scores (28).

324 *...if there's any wincing or they're quiet or they just don't want to move. You can tell when someone*  
325 *is in pain and when someone isn't. (Role not reported, 31)*

326 *Texting whilst you walk in! That's a good sign [group laughter] that they are not requiring of*  
327 *morphine (Role not reported, 30)*

328 Staff expressed frustration at patients for not taking analgesia when they considered it was required  
329 (14), or for expecting more analgesia than they were prepared or able to give. Patient responsibility  
330 for accepting reasonable analgesia was seen as an enabler (27).

331

### 332 **Concordance between qualitative and quantitative studies.**

333 All cross-sectional surveys were developed from a list of barriers to pain management developed  
334 from the general literature, (i.e. not specific to the ED) though the surveys were carried out in ED  
335 contexts. Qualitizing the quantitative data in order to undertake qualitative synthesis of the data  
336 was challenging, particularly due to the brief and unclear nature of some of the questions. Due to  
337 heterogeneity in the questions reported within the surveys, it was difficult to draw conclusions  
338 about the strength or prevalence of particular views, although certain themes were better  
339 represented within the different types of studies. The themes of time and workload pressures rated  
340 highly across all quantitative surveys. Quantitative surveys also raised questions that did not emerge  
341 from the qualitative studies. Interestingly, the barrier of 'inability to medicate unless diagnosis is  
342 made' was the top ranking barrier within the quantitative studies of Tanabe (22) and Duignan (37),  
343 yet was only mentioned briefly in one of the qualitative studies (28).

344 **Discussion**

345

346 **Statement of principal findings**

347 Despite the different scope, aim and settings of included studies, and considerable heterogeneity in  
348 the populations studied, we identified key interpretative themes from the data. The thematic  
349 synthesis suggested that staff feel that the environment and context of the ED is a major barrier to  
350 pain management with too many 'other priorities' to deal with and high workloads and surges in  
351 demand making it difficult to cope and find time for pain management. Barriers around lack of time  
352 and the responsibility of caring for other patients ranked highest amongst the surveys overall.  
353 However, the qualitative data revealed limited motivation to change, with staff not perceiving that  
354 their own pain management practices required improvement and expressing frustration at the  
355 patients whose expectations for pain management differ from their own. Pain was not seen as a  
356 'clinical priority' or organisational priority; rather the focus was on diagnosing and moving patients  
357 appropriately, while meeting organisational targets. Staff relied on expert opinion and experience  
358 rather than knowledge gained from education, training or protocols.

359 The generation of interpretative themes from the evidence synthesis enabled deeper insight into the  
360 barriers and enablers to pain management than those provided by the individual studies themselves.  
361 Previous editorials and opinion pieces that reflected upon the barriers to pain management focussed  
362 largely on difficulties involved in assessing pain, reassessing pain and a reluctance to prescribe  
363 opioids due to fear of drug-seeking behaviour, as well as factors associated with patient expectations  
364 and poor staff knowledge. Whilst some of the articles included within this review also reported  
365 these factors, the overall analysis suggested that barriers are broader and involve beliefs and  
366 motivation regarding pain management. Findings also align with those themes identified by  
367 Sampson et al who found that pain management was not perceived to be an organisational priority,  
368 education and training on pain management was poor and that staff beliefs limited their capacity to  
369 improve pain management (17).

370

371 **Strengths and limitations:**

372 This mixed methods review synthesizes findings from both quantitative and qualitative studies on  
373 staff views of barriers and enablers to pain management in the ED and draws together perspectives  
374 of nurses, physicians, paramedics and other members of staff who have a role in pain management  
375 in the ED. Quantitative studies provided limited response sets but were included to provide an  
376 estimate of how strongly staff felt particular factors acted as barriers or enablers. The inclusion of  
377 qualitative data allowed themes to be developed inductively (i.e. culture, lack of belief in change,  
378 over-reliance on experience) which were not reflected in the pre-defined (deductive) research  
379 questions in quantitative studies that focused on organisational and environmental barriers.

380 The inclusion criteria for this review were broad, leading to considerable heterogeneity in the  
381 populations studied and focus of the articles. Some studies were over 10 years old. Only two of the  
382 qualitative studies had the identification of barriers and enablers to pain management as their  
383 primary aim. The total number of studies was low and saturation of data was not reached across all  
384 themes. Data quality was variable and even where studies scored reasonably well on the MMAT

385 criteria, they often lacked important details about data collection and analysis. Studies relied on staff  
386 reports and did not use observation or review of documentation, which can provide data that are  
387 not subject to social response bias. In interviews or focus groups, staff are more likely to depict the  
388 environment (i.e. an external factor) as a barrier rather than shortcomings to their own practice.

389 Results from these studies may have limited transferability to settings outside the country in which  
390 they are based, due to different emergency care systems. Due to the small number of studies, it was  
391 not possible to characterize results by country, or healthcare setting, or even by population (e.g.  
392 chronic/acute pain, paediatric/adult pain). However, combining heterogeneous populations allowed  
393 cross-cutting themes to be developed, and demonstrated that the wider barriers to pain  
394 management that relate to ED culture and attitude are not restricted to management of specific  
395 populations.

396 Studies provided a limited amount of data differentiating the perspectives of different staff groups.  
397 Identifying differences in views of physicians and nurses would allow better understanding of  
398 perceived staff barriers.

399 The initial title and abstract screening was undertaken by only one author; as no additional articles  
400 were identified by reference list searching, we do not feel that this will have significantly affected  
401 the results. One author was undertaking qualitative data collection and analysis concurrently and  
402 this may have impacted on themes derived, although data was also analysed by a second,  
403 independent analyst. Excluding the author's study from the analysis also meant that all potential  
404 data was not included.

405

#### 406 **Implications: possible explanations and implications for clinicians and policymakers**

407 Despite a broad search strategy and inclusion criteria, this systematic review of the literature  
408 revealed limited research reporting barriers and enablers to pain management in the ED, with  
409 qualitative research emerging only within the past decade. This lack of evidence perhaps reflects the  
410 lower priority given to pain management in practice, the lack of belief in the need to change and the  
411 acceptance of the status quo we found in existing studies. Whilst research is being undertaken into  
412 improved methods of analgesia, there is little attention to how the processes of pain management  
413 can be improved in practice.

414 The rhetoric of time and environment as a barrier suggests that ED staff feel unable to break down  
415 or circumvent these barriers to change their practice. The lack of awareness of the need to change  
416 results in little impetus to change. However, we found a number of barriers that might be more  
417 open to change. Knowledge deficits and a desire for education and training suggest that there is  
418 potential to empower staff to understand pain management principles better and remove barriers  
419 due to lack of knowledge. Similarly, providing feedback (perhaps by pain champions) on  
420 performance may convey the importance of improving pain management. Organisational  
421 interventions such as nurse-initiated analgesia, management plans for regular attenders and clear  
422 protocols, as well as clarification of roles and responsibilities for who provides pain management,  
423 may also help improve practice whilst not increasing workload significantly.

424

425 **Conclusions**

426 ED staff perceptions of the environment and context of the ED as principal barriers to pain  
427 management may mask underlying beliefs that hinder but are amenable to improvements.  
428 Addressing these beliefs and providing clearer goals and expectations may enable staff to prioritise  
429 pain management.

430

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- 583

584 Table 1: Results of the Mixed Methods Appraisal Tool assessment.

	1.1	1.2	1.3	1.4	4.1	4.2	4.3	4.4	Score
Berben	Y	Y	Y	N					3
Bergman	Y	Y	Y	N					3
Bennetts	Y	Y	Y	N					3
Chafe	Y	Y	Y	N					3
Davidson	Y	Y	Y	N					3
Donnelly	Y	Y	N	N					2
Fry	Y	Y	Y	N					3
Gauntlett-Gilbert	Y	Y	Y	N					3
Gorowara-Bhat	Y	Y	Y	Y					4
Shaban	Y	Y	Y	N					3
Shoqirat	Y	Y	Y	Y					4
Wilsey (b)	Y	Y	N	N					2
Admassie					Y	DK	N	Y	2
Ali					DK	DK	N	Y	1
Duignan					Y	Y	Y	Y	4
Hamalainen					Y	DK	N	N	1
Lea Mortensen					Y	Y	Y	Y	4
Louriz					Y	N	DK	Y	2
Pretorius					Y	DK	Y	Y	3
Rampanjato					Y	Y	N	Y	3
Tanabe					Y	Y	Y	N	3
Thomas					Y	Y	N	Y	3
Tsai					Y	Y	Y	Y	4
Wilsey (a)					DK	DK	Y	Y	2

585 DK = don't know / unable to tell.

586 1.1 Are the sources of qualitative data (archives, documents, informants, observations) relevant to  
587 address the research question (objective)?

588 1.2 Is the process for analyzing qualitative data relevant to address the research question  
589 (objective)?

590 1.3 Is appropriate consideration given to how findings relate to the context, e.g., the setting in which  
591 the data were collected?

592 1.4 Is appropriate consideration given to how findings relate to researchers' influence, e.g., through  
593 their interactions with participants?

594 4.1 Is the sampling strategy relevant to address the quantitative research question (quantitative  
595 aspect of the mixed methods question)?

596 4.2 Is the sample representative of the population understudy?

597 4.3 Are measurements appropriate (clear origin, or validity known, or standard instrument)?

598 4.4 Is there an acceptable response rate (60% or above)?

599 Table 2: Overview of descriptive themes and barriers and enablers within each theme.

	Barriers	Source	Enablers
Culture/context	ED is for 'sick' people and pain is not seen as a clinical priority – it doesn't kill or affect treatment decisions. Focus on diagnosis. Chronic pain not seen as our job.	(14, 15, 27, 30, 35, 36, 47)	Presence of pain champion (15)
	Busy, noisy, pressurised environment with heavy workload, surges in demand and wide range of tasks that take up staff time.	(14, 15, 27, 28, 30, 32, 36, 45, 46)	Improved resources
	Pain is a common presentation, potentially leading to a level of desensitisation from staff.	(14, 27, 32)	
	Lack of teamwork and communication about pain management between members of the team	(14, 27, 29, 31, 32)	High quality communication and interprofessional practice (35)
Attitude/Belief	Staff have limited motivation to change due to confidence in own ability and reliance on own judgement. Entrenched practices are passed down from senior to junior staff	(14, 15, 28, 29, 32)	Openness and motivation to change (15)
	Lack of belief in patient level of pain or pain scores. Feeling that patients manipulate score due to expectations of pain relief, drug seeking behaviour or to increase urgency of triage category.	(14, 27, 28, 31,32)	Evidence of effectiveness of interventions / audit to improve practice (15, 32)
	Frustration at patients who won't self-care and don't use the system appropriately, have too high expectations or refuse analgesia.	(14, 15, 27, 34, 36, 46)	
	Belief that need known painful condition prior to giving analgesia / fear that medication may hamper diagnosis	(28)	
Knowledge and confidence	A lack of education, clear protocols and shared aim as to what pain management should be leads to resistance to over-prescribe for fear of adverse events.	(14, 15, 28, 31, 32, 45)	Education, clear protocols and guidelines. (14, 15, 28, 31, 32, 47)
	Reluctance to over-prescribe analgesia for fear of adverse events	(14, 15, 29, 31, 47)	

	Knowledge of how to use pain scores and interpret patient-reported scores.	(14, 27, 28, 32)	
	Inadequate awareness of non-pharmacological methods.	(28)	
Organisational	Legislation and protocols around opioid administration lead to delays in awaiting physician prescription.	(15, 28)	Nurse-initiated analgesia (28, 35)
	ED driven by organisational focus on waiting times and other key performance indicators rather than pain.	(14, 15)	Use of management plans for regulars (30)
	Rapid staff turnover, staff shortages and inappropriate staff skillmix	(14, 15, 34)	

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