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## Abstract

This systematic literature review surveyed the evidence for the acceptability and effectiveness of CBT and psychologically based interventions for emergency department (ED) attenders with physical health complaints as their primary concern, in light of overburdened EDs and the existing evidence base for psychological interventions in other medical settings. The review protocol was registered with the International Prospective Register of Systematic Reviews (PROSPERO; CRD42018087860). A systematic search of three databases (APA PsychNet, Cochrane and PubMed) was performed to identify psychological treatment studies targeting physical health problems presenting in the ED, with broad inclusion criteria to capture a coherent understanding of the current knowledge base. 2606 potential studies for inclusion were identified, forty-five proceeded to full review. Twenty papers met the full inclusion. Included studies covered four clinical areas: trauma/PTSD-prevention, panic attacks, non-cardiac chest-pain and miscellaneous. A narrative description of findings reflected positive outcomes across all groups, however this was not consistent across any group. Few studies, measured ED attendance (20%) or satisfaction/acceptability (10%). The majority of studies (90%) were underpinned by a cognitive behavioural framework, consistent with the current evidence base as applied to the management of medical conditions. Findings suggest there is some evidence that interventions in the ED are effective and acceptable to patients, however interpretation of findings is limited by the mixed quality of designs and risk of bias.

*Keywords:* CBT, emergency department, accident & emergency, psychological interventions, systematic review

23 **Key Learning Aims**

- 24       • To understand the current body of evidence for the feasibility and effectiveness of  
25       psychological interventions in the emergency department.
- 26       • To gain a clear understanding of the models and format of the delivery of CBT and  
27       psychological interventions in an acute setting.
- 28       • To identify gaps in the evidence to inform future development of CBT-based  
29       interventions to improve outcomes and clinical care.

30 **Acceptability and effectiveness of CBT and psychologically based interventions for**  
31 **emergency department attenders with physical health complaints as their primary**  
32 **concern: a systematic literature review**

33 Crowding in emergency departments (ED) is a long-standing international issue (Di  
34 Somma et al., 2015) and demand continues to rise (Coster et al., 2017). While most research  
35 conducted in this field derives from the UK and US, the problem is global in scale (Savioli et  
36 al., 2022). A key factor in the overburden of EDs is the resource implications associated with  
37 repeat attenders with common clinical presentations such as chronic physical health problems  
38 (Pines et al., 2011), poor mental health (Hunt et al., 2006), and alcohol and substance misuse  
39 problems (Lynch & Greaves, 2000). Best practice guidance on supporting *repeat* attenders in  
40 the ED states that psychological therapies should be provided (Royal College of Emergency  
41 Medicine, 2017). Existing research demonstrates that these aforementioned repeat  
42 presentations are amenable to commonly utilized and efficacious psychological interventions  
43 such as Cognitive Behavioural therapy (CBT), signalling that early intervention in the ED  
44 may offer opportunity to prevent repeat attendance for the same problem. However, despite  
45 extensive evidence supporting the utility of CBT in the most common ED presentations such  
46 as non-cardiac chest pain, panic and medically unexplained symptoms (MUS), and the  
47 proliferation of psychological therapists in the field of medical psychology (McAndrew et al.,  
48 2019) the efficacy of such interventions delivered in the ED has not been established.

49 Clinicians in the ED commonly refer patients to psychological therapy on discharge,  
50 however engagement with therapy post-discharge is often low. This is particularly the case in  
51 complex groups such as those with MUS (Balabanovic & Hayton, 2020), trauma symptoms  
52 (Kantor et al., 2017), and where attendance is precipitated by psychological distress  
53 associated with physical symptoms, rather than the physical symptoms per se. (Daniels et al.,  
54 2018). In these instances, early intervention is required, with a focus on targeting barriers to

55 engagement (e.g. treatment-related doubts, perceived stigma, misperceptions) which can be  
56 addressed collaboratively between medical staff and psychological therapists (Kantor et al.,  
57 2017). Previous research has established that engagement in psychological therapies in the  
58 ED has been directly associated with positive treatment outcomes and reduced attendance  
59 (Holdsworth et al., 2014), with cost savings of £1 to every £7 spent, in medical psychology-  
60 led ED interventions (Dr Foster, 2018) which supports the rationale for psychology in  
61 emergency care. Indeed, engaging patients within the ED may be more acceptable for those  
62 with pronounced physical symptoms and a psychological component (Marks & Hunter, 2014;  
63 Carroll et al., 2020).

64 Advances in our understanding of the utility of psychological interventions in the ED  
65 would inform future service planning and development which has the potential to improve  
66 patient outcomes and reduce strain on ED's. This is particularly relevant given the extensive  
67 evidence base for psychologically based interventions in medical conditions, primarily CBT,  
68 through the expansions of psychological therapy into long-term conditions (NHS England,  
69 2018) via Improving Access to Psychological Therapies services. Given the pressures on the  
70 ED, the amenability of many medical conditions to psychological therapy and the growth of  
71 the evidence-based psychological workforce, what works and for whom becomes an  
72 important question.

73 This review aims to address this knowledge gap by using a systematic approach to  
74 evaluate the literature to establish whether psychological interventions, particularly CBT, are  
75 feasible to deliver in the ED, acceptable and effective at improving pre-defined patient  
76 outcomes for adults who attend the ED with physical health complaints as their primary  
77 concern. We purposefully a) retain a broad view of psychological therapies to ensure a  
78 comprehensive view of the theoretical underpinning and modalities and b) include all study

79 designs, in order to gain a fuller picture of the state of the evidence, appropriate to the  
80 parameters of the first systematic review of its kind.

## 81 **Methods**

82 This systematic review protocol is registered with the International Prospective  
83 Register of Systematic Reviews (PROSPERO; CRD42018087860). The review follows the  
84 Preferred Reporting Items for Systematic Review and Meta-Analysis Protocols (PRISMA)  
85 guidelines (Moher et al., 2009).

### 86 **Search strategy**

87 Three electronic databases were used for this systematic literature review: Cochrane,  
88 PubMed and APAPsycNet. There were no restrictions on date, language, publication status or  
89 study design. Interrogation of the databases conducted 27th May 2020 used adapted terms  
90 following the PICO (Population, Intervention, Control, Outcome) elements of our research  
91 question (see supplementary material for full search string).

### 92 **Study selection**

93 All intervention study designs meeting criteria were included in this study; as the first review  
94 to explore this area, all studies were deemed relevant to the research question. Evidence from  
95 non-randomised controlled trials (RCT) were considered in context of the limitations in  
96 design and risk of bias; the broad and inclusive scope allows the optimal capture of the  
97 current state of knowledge in the field; see Table 1 for full inclusion and exclusion criteria.  
98 Data relating to the quality of psychotherapeutic interventions were also extracted, drawing  
99 from authoritative reviews of quality assessment criterias for psychotherapies (Liebherz,  
100 Schmidt, & Rabung, 2015; Chambless & Hollon, 1998). Specific references were made to the  
101 following: a theoretical framework, level of therapist training, number of dropouts reported,

102 identification of inclusion and exclusion criteria, and whether the integrity of the intervention  
103 was checked.

104 SMcG conducted database searches and screened abstracts and full texts in order to  
105 determine if they met the inclusion criteria. Following removal of duplicates, 20% of  
106 abstracts and full papers were reviewed by an independent analyst (SL) for quality assurance  
107 purposes.

108 *Insert Table 1 here*

### 109 **Quality assessment**

110 Cochrane risk of bias tool (Higgins & Green, 2011) was used to assess study level  
111 bias by two study authors independently (SMcG; MH). Studies were rated high, low or  
112 unclear on the following domains: selection which includes sequence generation; allocation  
113 concealment; blinding of participants and personnel; blinding of outcome; attrition; selective  
114 reporting; other bias and overall risk of bias. A Grading of Recommendations Assessment  
115 Development and Evaluation (GRADE) methodology and a GRADE summary of findings  
116 table was planned.

### 117 **Ethical statement**

118 As the study was a systematic literature review, no ethical approval was required. The study  
119 proposal was peer reviewed and registered on Prospero database. All authors have abided by  
120 the Ethical Principles of Psychologists and Code of Conduct as set out by the BABCP and  
121 BPS.

122

## 123 **Results**

### 124 **Search results**





148 studies were both initiated and completed within the ED, 7 were initiated in the ED and  
149 completed on site (observation units, cardiac clinics or wards, surgical wards, clinical  
150 psychology clinic). Most studies (65%, n=13) were delivered by a psychological therapist;  
151 other delivery personnel included social worker, nurse, researcher, clinician (not specified),  
152 psychiatric professional and health educator (n=7).

### 153 **Intervention characteristics**

154 Of the included studies, 90% (n=18) were underpinned by a cognitive and/or  
155 behavioural approach, 5% (n=1) a behaviour-change counselling approach, 5% (n=1) or  
156 psychodynamic in orientation. Studies were protocolised to either one (n=4), two (n=13), or  
157 three active treatment conditions (n=3). The number of sessions per therapist delivered  
158 intervention varied, with some (35%, n=7) studies delivering 1, 65% (n=13) delivering  $\geq 2$   
159 sessions (see Table 3). Session duration ranged from 10 to 120 minutes, with a modal  
160 duration of 1 hour.

### 161 **Quality of psychotherapeutic intervention**

162 Eighteen of the twenty studies (90%) refer to an underpinning theoretical framework, sixteen  
163 of which provide a rationale for the relevance of theoretical application to the intervention.  
164 The remaining two studies referred to brief psychiatric interventions focused on exposure  
165 treatment but in the absence of theoretical underpinning. All studies provided information  
166 about the procedure. Seven of the twenty studies (35%) reported checking for intervention  
167 integrity, using a structured therapeutic integrity instrument (n=1), and audiotaping treatment  
168 sessions to check for adherence to the planned intervention and by comprehensively  
169 manualising the sessions (n=6).

170

171 Sixteen studies (80%) reported the level of therapist training including information pertaining  
172 to their qualifications. Of the remaining studies, two studies referred to therapists delivering  
173 the intervention, but the level of training or qualifications were not reported, one study did  
174 not state the level of training or qualifications and one study referred to a technological  
175 intervention with no therapist required. The number of dropouts were reported by 60%  
176 (n=12) of the studies, six did not report dropouts, and for two studies the number of dropouts  
177 were not applicable given the studies single case study design. Finally, inclusion and  
178 exclusion criterion were reported by seventeen studies (85%), one study only reported the  
179 inclusion criteria and two studies reported neither (see table 4)

180 *Insert table 4*

### 181 **Study outcomes**

182 Outcomes varied according to presentation, which naturally emerged into four groups:  
183 trauma/PTSD-prevention (n=7); panic attacks (n=5) non-cardiac chest pain (NCCP; n=5) and  
184 miscellaneous (n=3).

185 For trauma related studies, the PTSD symptom scale interview (PSS-I) was most  
186 commonly used primary outcome measure (n=3). Other measures included the post-traumatic  
187 diagnostic scale (PDS; n=2), the Impact of Events Scale-Revised (IES-r; n=2) Post-trauma  
188 Checklist (PCL-5; n=1) and idiosyncratic measures (n=1).

189 In the panic-related studies, two used the Anxiety Disorder Interview schedule for  
190 DSM-IV (ADIS-IV) to assess severity of panic as the primary outcome measures, one study  
191 used the self-rating version of the panic disorder severity scale (PDSS-SR). Other measures  
192 included ED attendances (n=1), Fear Questionnaire (FQ; n=1), the Beck Depression  
193 Inventory (BDI; n=1), the mobility inventory (MI; n=1) and frequency of panic attacks (n=1).

194 NCCP primary outcome measures included chest pain frequency and severity (n=1),  
195 Anxiety Sensitivity Index (ASI; n=1), Cardiac Anxiety Questionnaire (CAQ; n=1), patient  
196 health questionnaire (PHQ-9; n=1), Generalized Anxiety Disorder (GAD-7; n=1), work and  
197 social adjustment scale (WSAS; n=1) and ED usage data (n=1) and the Short Health Anxiety  
198 Inventory (SHAI) (n=1).

199 Studies in the miscellaneous group reported a broad range of outcome measures (see  
200 Table 3) including the cardiovascular risks of the health motivation assessment inventory  
201 subscale (HMAI; n=1), adapted health belief scale (OHBS; n=1), SHAI (n=1), PHQ-9 (n=1),  
202 GAD-7 (n=1) and the cardiac diet self-efficacy index (CDSEI, n=1). Four of the 20 studies  
203 (20%) reported the impact of intervention on ED attendance.

204 *Insert Table 3 here*

205 As reflected in table 3, there was little consistency in relation to the choice of outcome  
206 measures or primary outcome measures in clinical groupings, with 11 of 20 studies (55%)  
207 reporting a clear primary outcome measure.

### 208 **Descriptive (narrative) analysis of findings**

209 Studies are discussed in relation to their clinical groupings in order to promote a  
210 coherent synthesis of findings.

### 211 **Trauma/post-traumatic stress disorder prevention (n=7)**

212 Two RCTs used a CBT approach to prevent PTSD, both interventions reported  
213 effectiveness. One study (Wu et al., 2014) offered brief CBT (B-CBT) to patients showing a  
214 moderate level of distress (measured by IES-R) following a motoring accident, with a  
215 comparison group receiving self-help guidance. B-CBT comprised four 1.5-hour weekly  
216 sessions with participants encouraged to produce written and verbal accounts of their

217 motoring accident, where cognitive distortions could be targeted (Wu et al., 2014). B-CBT  
218 reduced psychological distress at 3-months ( $p=.004$ ) HADS-A and HADS-D at 6-month  
219 follow-up (HADS-A:  $p=.044$ ; HADS-D:  $p=.013$ ) but there was no statistically significant  
220 difference in IES-R effect score, the primary outcome variable. The study was underpowered  
221 and lacked a no treatment control, undermining confidence in the findings. Brunet et al.  
222 (2013) described a 2-session CBT intervention which found a modest effect on the primary  
223 outcome ( $d=0.39$ ) when improvement in the control participants was controlled for. The 2-  
224 year follow-up study (Des Groseilliers et al., 2013) included 70% of the original sample and  
225 reported that the intervention was effective compared to controls ( $p=.008$ ), however findings  
226 are interpreted with caution due to a potential sampling bias.

227 Two RCTs described technology-enabled PTSD prevention. A proof-of-concept trial  
228 used a brief Tetris game to prevent intrusive images (Iyadurai et al., 2017). At 1-week follow-  
229 up, intervention participants reported less distress from intrusion symptoms (target symptom)  
230 than controls ( $d=0.54$ ). Another study used technology to enhance usual care over 6-months  
231 (Zatzick et al., 2015) which showed modest but non-significant symptom reductions ( $p=.055$ )  
232 with the greatest effect at 3-month ( $d= 0.35$ ,  $p=.044$ ) and 6-month ( $d= 0.38$ ,  $p=.044$ ) follow-  
233 up. This is an exploratory pilot study, and the results support further research in this area.

234 The three uncontrolled studies for trauma used exposure for PTSD-prevention. A one-  
235 session exposure intervention ( $n=1$ ) was described as effective as the participant did not  
236 report PTSD related symptoms despite risk factors (Post et al., 2017). However, case study  
237 results must be interpreted with caution and are not readily generalizable. A further pilot  
238 study used three 1-hour psychoeducation and exposure sessions (Rothbaum et al., 2008)  
239 reporting a positive but insignificant outcome, however this was limited by a small sample  
240 ( $n=10$ ). A larger follow-on study ( $n=137$ ) (Rothbaum et al., 2012) demonstrated effectiveness

241 in preventing PTSD at 1 and 3-month follow-up (1 month:  $p=.004$ ; 3-month:  $p=.05$ ).

242 However, the study was noted as underpowered, risking a type II error.

### 243 **Panic attacks (n=5)**

244 No studies met the criteria of RCTs for the treatment of panic attacks. Dyckman et al.  
245 (1999) (n=354) compared two intervention groups; both received treatment as usual (TAU), a  
246 psychiatric referral and a brochure. One of the two intervention groups also received a brief  
247 contact with an educator from the psychiatric department or ED personnel offering one 20-  
248 30-minute anxiety management intervention. This was then compared to a historical TAU  
249 control group. There was a statistically significant decrease in ED usage in the brief contact  
250 group ( $p=.0017$ ) in comparison to the brochure only condition, but not in comparison to the  
251 control group ( $p=.0672$ ). The study does not report on the intervention's effectiveness, only  
252 the impact on ED utilization; this reflects likely selective reporting and demonstrates high  
253 risk of bias. Conclusions are limited by this.

254 Nuthall and Townend (2007) offered a single 45-minute B-CBT intervention for panic  
255 or TAU/assessment only (n=27). Results indicated a non-significant difference in panic  
256 severity between groups at 1-month ( $p=.208$ ) and 3-months ( $p=.427$ ) follow-up, however the  
257 overall sample size was small, and participants were not randomized; hence results can only  
258 be considered preliminary.

259 The Swinson et al. (1992) study active treatment arm consisted of one 60-minute  
260 session of reassurance or reassurance plus exposure instruction (n=33), with the active  
261 treatment group benefiting for up to 6 months on all measures including Depression  
262 Inventory ( $F=7.78, df=1,31, p<0.002$ ) Mobility Inventory ( $F=8.56, df=1,31, p<0.002$ ), Fear  
263 Questionnaire agoraphobia subscale ( $F=6.65, df=1,30, p<0.003$ ) and panic frequency

264 (F=4.13,df=1,31,p<0.03). Due to unclear reporting, there was a high risk of bias in this study;  
265 while this study outlines an intervention study, it does not appear to be reported fully.

266 Two papers describe the same CBT intervention with different samples: Lessard et al.  
267 (2011) compared a one session panic management intervention, a seven-session bi-weekly  
268 CBT intervention, and usual care for panic disorder and NCCP; Pelland et al. (2011)  
269 compared a seven-session CBT intervention with medication and usual care. A one-year  
270 follow-up study (Marchand et al., 2012) reporting both the Pelland et al. (2011) and Lessard  
271 et al. (2011) studies found all interventions to be effective when compared with usual care but  
272 no significant difference between conditions (p=.095). These studies had high risk of bias  
273 across most domains therefore these results cannot be reliably interpreted.

#### 274 **Non cardiac chest pain (n=5)**

275 Three RCTs tested the efficacy of CBT to treat chest pain. Tyrer et al. (2017)  
276 compared a modified form of CBT for chest pain (CBT-CP) with standard care. CBT-CP is  
277 an adaptation of CBT for health anxiety, including 4 to 10 sessions over 3 to 6-months (Tyrer  
278 et al., 2017). No significant group differences on any measure were found at either 6-months  
279 or 12-months, however a reduction was seen in ED attendance; a cost analysis of this change  
280 found a non-significant reduction (p=.798) in total costs per patient (Tyrer et al., 2017). The  
281 study was reported to be under-powered (n=68) which indicates a possible type II error. van  
282 Beek et al. (2013) compared TAU to a B-CBT intervention for patients with NCCP who were  
283 also diagnosed with depression and panic. The B-CBT consisted of six 45-minute sessions  
284 and was based on Clark's cognitive therapy for panic disorder (Clark, 1986). Using an intent-  
285 to-treat analysis at 6-month follow-up, the results showed that CBT was superior to TAU in  
286 reducing disease severity on the clinical global impression severity scale (CGI-severity)

287 (p<0.001). The study has some methodological limitations including a high attrition of 34%  
288 after allocation.

289 Mulder et al. (2019) reported a well-controlled RCT of a brief intervention based on  
290 the biopsychosocial approach termed NCCP directed CBT (n=424). The intervention  
291 included 3-4 sessions consisting of education and self-management for chest pain and  
292 reducing cardiac risk factors, compared to TAU. No statistically significant differences were  
293 found at either 3-month or 12-month follow-up between groups. A statistically significant  
294 reduction in health anxiety as measured by the HAI was reported in the intervention group at  
295 the 3-month (p<.01) but not at the 12-month follow-up; participants who had previously  
296 presented with chest pain prior to intervention were significantly less likely to re-present to  
297 ED at the 3-month but not the 12-month follow-up, producing an overall temporary gain.

298 It is noted that while there is conceptual convergence of health anxiety and NCCP, the  
299 Health Anxiety Inventory (HAI), as used in both the Tyrer et al. (2017) and Mulder et al.  
300 (2019) studies, may only be sensitive to changes in the former. Neither paper explored the  
301 theoretical rationale or evidence to use the measure, or the potential overlap between health  
302 anxiety and NCCP, and may explain the lack of positive findings. The focus of the  
303 intervention was also different. Further research is needed to draw consensus of an  
304 appropriate measure for use with NCCP; Tyrer reported use of an unstandardized NCCP  
305 adapted measure, but reliability is not reported in the paper.

306 Two quasi-experimental studies used CBT for NCCP. Esler et al. (2003) compared B-  
307 CBT (n=29) with TAU (n=30) for NCCP. The B-CBT consisted of an adapted (Barlow et al.,  
308 1989) 60-minute intervention in the ED for chest pain symptoms (Esler et al., 2003).  
309 Statistically significant decreases were found in chest pain episodes, anxiety sensitivity and  
310 fear of cardiac symptoms in the CBT group at 1 and 3-month follow-ups (p=.02). However,

311 there were no significant differences in scores on measures of chest pain severity, cardiac-  
312 related avoidance or attention. Wilkinson et al. (2019) reported on an IAPT@Flinders NCCP  
313 care pathway for low-intensity CBT (LICBT) in the ED (n=35). Statistically significant  
314 reductions were found for participants who only completed 2 sessions, with a reduction in  
315 scores between the first and second LICBT session on the PHQ-9 ( $p = .004$ ), GAD-7  
316 ( $p = .002$ ), and WSAS ( $p = .004$ ). ED usage data 3-months prior and 3-months post-  
317 intervention represented a 59% reduction in ED presentation and a 69% reduction in costs.  
318 With a small sample size, convenience sampling, and no control, caution must be taken when  
319 interpreting and generalizing the results. NCCP was also not the focus of the intervention.  
320 Nonetheless, the reduced psychological distress, ED presentation, and economic costs  
321 reported by this pilot study supports further research in this area.

### 322 **Miscellaneous (N=3)**

323 One RCT (Katz et al., 2017) aimed to support cardiac patients to move towards a  
324 healthier lifestyle (rather than symptomatic relief of immediate cardiac symptoms) offering  
325 brief or extended behaviour-change counselling. Results did not demonstrate significant  
326 differences between treatment arms in longitudinal follow-up. When the results of both  
327 treatment arms were combined patients showed significant differences on cardiac risk factor  
328 behaviour-change at follow-up ( $p < 0.0001$ ), however absence of a control group and  
329 combination of two condition obscures a meaningful or reliable interpretation.

330 In a quasi-experimental study by Abbass et al. (2009), patients with ‘medically  
331 unexplained’ symptoms (n=50) including chest pain, headache, shortness of breath and  
332 abdominal pain received a short-term dynamic psychotherapy intervention with a minimum  
333 of 1 session (Abbass et al., 2009). Improvements were seen on the self-reported Brief  
334 Symptom Inventory (BSI) ( $p < 0.01$ ) and a statistically significant reduction in ED usage was



335 reported, with a 69% reduction in ED visits per patient ( $p < 0.001$ ). However, this study had a  
336 high risk of bias and limitations included a lack of a comparison or control group and  
337 participant selection bias.

338 Finally, a single case study using standard CBT to reduce health anxiety in Addison's  
339 disease (Daniels et al., 2017) demonstrated effective outcomes and complete amelioration of  
340 ED usage at 1 year follow up, however this was not substantiated with business data. The  
341 only pre-intervention baseline for comparison was ED attendance rather than distress or  
342 physical symptoms, and as this is a case study the results are not easily generalizable.

### 343 **Acceptability and satisfaction of interventions**

344 All studies were assessed for participant uptake rate, defined as the percentage of  
345 eligible patients who consented to participate (see table 3). Uptake ranged from 45.7-100%,  
346 with an average of 67.9%, higher uptake rates did not appear to relate to any particular study  
347 design or clinical group, however, generally speaking smaller studies reported higher end  
348 uptake rates which may be expected given the proportionate ratio.

349 . Two studies measured patient satisfaction ratings for their interventions: Abbass and  
350 colleagues report a 93% response rate ( $n=13$ ) with overall satisfaction of 7.4 out of 10 (SD  
351 2.1, range 4-10), indicating 'satisfied/very satisfied;' for Iyadurai and colleagues the median  
352 group values reflected that they found the Tetris intervention very easy (median=7), very  
353 helpful (median=7) and minimally distressing/burdensome (median=1), response rate was not  
354 reported.

## 355 **Discussion**

356 Overall, findings reflect that there is some evidence to suggest that psychological  
357 interventions, particularly CBT, are acceptable and effective at improving pre-defined patient  
358 outcomes for adults who attend the ED with physical health complaints as their primary

359 concern. Most studies adopted a broad CBT approach, which is unsurprising given CBT is  
360 the recommended treatment of choice for the common ED complaints included in this study,  
361 such as NCCP (Chambers et al., 2013), panic (NICE, 2011), post-traumatic stress disorder  
362 (NICE, 2005) and those in the miscellaneous category (health anxiety, medically unexplained  
363 symptoms, cardiac rehabilitation). Most of the interventions were brief in nature, and while  
364 many of the studies included a psychological therapist in intervention delivery, it was evident  
365 that CBT based interventions were also being delivered by personnel appropriately trained in  
366 the modality.

367         Given the NHS Long term plan (NHS England, 2019) outlining the projected  
368 proliferation of increased access to psychological therapies services, the UK is well equipped  
369 to offer psychological interventions within the ED, where we know that psychology can  
370 effectively reduce healthcare costs (Dr Foster, 2018; Holdsworth et al. 2014). These findings  
371 suggest acute medical settings may be receptive to brief evidence-based interventions such as  
372 CBT, offering a potential avenue for early intervention and prevention of chronicity.  
373 However, low-quality designs and high risk of bias within the studies limit the  
374 generalizability of much of the findings. Considerable heterogeneity within the studies make  
375 it difficult to definitively refute or confirm overall efficacy of interventions in this setting,  
376 particularly as a formal meta-analysis was not viable.

377         Of those included, 14 out of 20 studies (70%) were completed within the last 10  
378 years, but some (n=6) studies are more than 10 years old. This reflects a significant paucity of  
379 research when broad parameters were defined; as the pressure in the ED increases, with many  
380 repeat attenders presenting with psychologically amenable conditions, a call for further high-  
381 quality research is needed - services will not develop in its absence. It is important however  
382 that there is a call to action; even an ‘empty’ review can meaningfully reflect the state of the  
383 evidence.

384           The heterogeneity in study design, outcomes, clinical presentations, and format of  
385 intervention was consistent across the clinical groups. The most homogenous group was  
386 trauma/PTSD prevention, however the interventions offered were dissimilar yet appropriately  
387 reflective of a rapidly developing field (Iyadurai et al., 2017). These findings bear some  
388 relevance to the 2020 COVID-19 pandemic, which has seen emerging research reporting  
389 significant trauma responses in frontline staff and post ICU patients (Daniels et al., 2021;  
390 Roberts et al., 2021; Thornton, 2020). Guidelines have been developed to accommodate this  
391 surge in psychological need, therefore on-site embedded or accessible psychological care  
392 should be considered for both staff and patients (Daniels et al., 2021; Carroll et al. 2020).

393           Average rate of uptake (67.9%) was higher than those reported in IAPT services,  
394 (56%, Di Bona et al. 2014), however this ranged from 45.7-100% using a variety of designs.  
395 Recent research has indicated that those with long term conditions may be more receptive to  
396 psychological interventions offered within the medical setting (Carroll et al. 2020), which is  
397 consistent with the move towards integrated models of care (Damian & Gallo, 2018). While  
398 we cannot compare directly to rates of uptake of psychology following discharge in ED, these  
399 rates of uptake are promising and may offer higher rates of engagement to difficult to engage  
400 groups.

401           The key conclusion we draw is that findings are promising but further research is  
402 warranted; by generating further evidence we potentially offer an avenue of non-invasive  
403 intervention for those in distress in high pressure environments. Future research should seek  
404 to address not only the issue of scarcity of research in this area, but also the quality. While  
405 heterogeneity is common in areas which feature a paucity of research, there was a common  
406 pattern of problems in the study design, outcome measurement and quality of interventions  
407 included in this review. On this basis, we offer specific key recommendations which pertain  
408 to addressing these issues, in order to strengthen the future research base and allow for more

409 meaningful comparison of studies and outcomes. The use of relevant reporting checklist (e.g.  
410 see EQUATOR network) and study pre-registration are also recommended.

411 *-insert table 5-*

412 *Table 5. Recommendations for future research*

413

414 Efficacy of CBT for presentations seen in community and outpatient settings is  
415 unequivocal (Fordham et al., 2021; Hofmann et al., 2012) therefore it is plausible,  
416 particularly in light of current findings, to suggest that CBT and other psychological  
417 interventions in the ED could prove beneficial and cost-effective. Initiating psychological  
418 interventions while in the ED may provide opportunity to overcome post discharge  
419 disengagement, reduce attendances, improve outcomes and offer economic cost benefits (Dr  
420 Foster, 2018; Holdsworth 2014), however we must test this further, and do so robustly.

#### 421 **Limitations**

422 Key limitations of this study relate to the broad scope of the search: all study designs  
423 were included in order to assess the scope of what is possible in the ED, however, the  
424 heterogeneity and relatively small pool derived from the search restricted our understanding  
425 even with a broad scope. Evidence provided by case studies is limited, yet these were  
426 included as the review aim purposefully encompassed all evidence available in an emerging  
427 field. Much of the evidence was poor quality and some more than a decade aged - this is a  
428 finding in and of itself – the need for further, better quality research cannot be refuted. By  
429 establishing current knowledge our next steps are now with direction.

#### 430 **Conclusions**

431           This review provides preliminary evidence supporting the utility of psychological  
432 interventions, particularly CBT, within the emergency department. These are timely findings  
433 in the context of a global ED crisis. Given the rapidly expanding availability and strong  
434 evidence for psychological therapies in medical settings, provision of CBT based  
435 interventions could offer a feasible and effective alleviation of personal and economic  
436 burden. However, further high-quality trials are needed to determine true efficacy and cost-  
437 effectiveness of such interventions.

**438 Key Practice Points**

- 439 • Psychological therapy may be feasible and acceptable to patients presenting to the  
440 emergency department with physical health complaints amenable to psychological  
441 intervention.
- 442 • The use of psychological interventions in emergency care shows some preliminary  
443 evidence of improving outcomes for patients in the ED.

444 CBT is the most common intervention trialled within the ED, in line with current  
445 evidence and guidelines for the use of CBT and medical conditions

**446 Further Reading**

- 447 • **Assessment and management of recurrent abdominal pain in the emergency**  
448 **department**
- 449 Daniels, J., Griffiths, M., & Fisher, E. (2019b). Assessment and management of  
450 recurrent abdominal pain in the emergency department. *Emergency Medicine Journal*,  
451 emermed-2019. <https://doi.org/10.1136/emered-2019-209113>
- 452 • **Cognitive behavioural therapy: why primary care should have it all**
- 453 Blane, D., Williams, C., Morrison, J., Wilson, A., & Mercer, S. (2013). Cognitive  
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- 456 • **The use of emergency department-based psychological interventions to reduce**  
457 **repetition of self-harm behaviour**
- 458 Witt, K. (2017). The use of emergency department-based psychological interventions  
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678 Table 1 See separate uploaded document

679 Table 2 See separate uploaded document

680 Table 3 See separate uploaded document

681 Table 4 See separate uploaded document

682 Table 5 See separate uploaded document

683 Figure 1 See separate uploaded document