

We are IntechOpen, the world's leading publisher of Open Access books Built by scientists, for scientists

6,900

Open access books available

186,000

International authors and editors

200M

Downloads

Our authors are among the

154

Countries delivered to

TOP 1%

most cited scientists

12.2%

Contributors from top 500 universities



WEB OF SCIENCE™

Selection of our books indexed in the Book Citation Index
in Web of Science™ Core Collection (BKCI)

Interested in publishing with us?
Contact book.department@intechopen.com

Numbers displayed above are based on latest data collected.
For more information visit www.intechopen.com



Assessing the Effectiveness of Brief and Low Intensity Psychological Interventions for Medically Unexplained Symptoms and Health Anxiety: A Systematic Review of the Literature

Orla McDevitt-Petrovic and Karen Kirby

Abstract

This chapter presents a systematic review of the literature to assess the effectiveness of *brief* psychological interventions for medically unexplained symptoms (MUS)/somatic symptom disorder, non-cardiac chest pain, and illness anxiety disorder or health anxiety (HA). Google Scholar, PubMed, and Web of Science were searched as data sources. Reference lists were subsequently examined for other relevant articles. Studies were assessed according to specified inclusion criteria and extracted according to PRISMA guidelines. A total of 23 studies were included in the final synthesis. Significant effects for intervention groups relative to control groups were reported in 19 studies, whilst 4 studies did not determine any significant benefits of interventions compared with controls. All of the brief interventions (CBT, psychosocial, psychophysiological, psychosomatic, relaxation and group therapy), with the exception of metaphor therapy, showed significant effects relative to controls in at least one study. The evidence suggests that brief psychological interventions, more specifically time limited CBT based interventions may be effective in treating HA and MUS with psychological distress. Findings are comparable with other reviews. Future research may facilitate the piloting of an intervention, and there remains a need to provide more robust evidence of cost effectiveness.

Keywords: LICBT, MUS, HA, depression, anxiety

1. Introduction

1.1 Definitions, diagnostic criteria and comorbidities

There has been considerable dispute around the classification and terminologies used in relation to medically unexplained symptoms (MUS) and associated syndromes [1, 2]. MUS is a general term for syndromes without a known pathological cause. The use of the term itself is also often problematic given the negative connotations. Indeed, many patients prefer the use of alternative terms, for example ‘persistent physical

symptoms' [3]. The current review assesses the effectiveness of brief interventions for MUS, illness anxiety disorder, somatic symptom disorder, health anxiety (HA) and non-cardiac chest pain (NCCP). Although there may be a degree of overlap within these, it is important to outline what distinguishing features there may be.

Some of the most pronounced revisions within the latest version of the DSM-V relate to MUS [4]. A new category ('Somatic Symptom and Related Disorders') has been created, wherein MUS fits. The category includes diagnoses of Somatic Symptom Disorder (SSD) which replaces the term MUS, and Illness Anxiety Disorder (IAD) which replaces HA. The term hypochondriasis is no longer referred to. The key difference between MUS and SSD is that SSD accounts for cases where symptoms may have an underlying pathology, but there remains an exaggerated response. However, given that SSD also includes cases where there is an absence of pathological cause (i.e. MUS), the term has been included in the current review in addition to a specific SSD and NCCP. The terms IAD and HA are both used to refer to the preoccupation with having a serious illness; somatic symptoms may not be present, or may present in mild form. MUS and IAD may therefore present in isolation or comorbidly; this is determined by the presence (or not) of physical symptoms without pathological cause, and the subsequent response to these.

Up to one third of individuals with physical health presentations have MUS [5]. The prevalence of MUS within the general population, and more particularly within medical settings, is high [6, 7]. MUS and HA are both associated with increased costs accrued through frequent and inappropriate use of healthcare services, absenteeism and long-term unemployment [8, 9]. It has been estimated that annual healthcare service costs resulting from psychosomatic symptoms are approximately £3 billion in the UK [10].

1.2 The role of depression and anxiety

Pain is one of the most commonly presented MUS [11]. Physical symptoms are highly prevalent in depression and may result in chronic pain and impede treatment effectiveness. Depression and pain are influenced by the same neurochemical processes, therefore both must be treated simultaneously in order to achieve improvements. Previous research has demonstrated that improvements in depressive symptoms was correlated with the improvement of some physical symptoms [12]. The prevalence of depression and anxiety among MUS patients has been estimated at 70% [11]. The division between services for physical health problems and mental health disorders reinforces the notion of body and mind as entirely separate entities, consequently adding to the psychological distress associated with MUS [13]. In relation to NCCP specifically, higher levels of anxiety have been detected among individuals with NCCP compared with health individuals [14]. Given that MUS and pain have high levels of psychiatric comorbidity, it has been suggested that a multidisciplinary intervention strategy may be appropriate [15].

1.3 Psychological interventions: MUS/SSD

Qualitative research has reported that individuals with MUS have a tendency to reject psychological constructs of their problems [16], resulting in an unwillingness to engage in psychological treatments [8, 17, 18]. However other studies have suggested that a significant percentage of these patients would consent to undergo psychological or psychiatric interventions [19]. Evidence suggests that cognitive behaviour therapy (CBT) is beneficial in the treatment of MUS [20, 21]. A systematic review and meta-analysis of non-pharmacological interventions for somatoform disorders and MUS in adults determined that psychological therapies irrespective of modality

were more beneficial overall than standard care or waiting lists in relation to reducing symptoms severity [22]. Fourteen from twenty one studies included in the review and subsequent analysis focused on CBT based interventions. CBT was determined to be more effective in reducing the severity of MUS, but there was insufficient evidence to support the efficacy of other modalities. Furthermore, although there is a robust evidence base demonstrating the effectiveness of high intensity CBT for somatoform related disorders, there are limited reviews investigating the effectiveness of low intensity or brief psychological interventions.

A critical review of 31 controlled clinical trials including 1600 patients where CBT was employed as an intervention for somatization and symptoms syndromes, found that CBT contributed to the improvement of physical symptoms in 71% of studies, functional status in 47% and psychological distress in 38% [23]. Furthermore, group therapy and brief treatments of 5 sessions were also found to be effective, with benefits maintained for up to one year. The review concluded that CBT is an effective intervention for this patient population, and that benefits were achievable even if psychological distress was not entirely alleviated. Similarly, although the focus was not on brief or low intensity treatments, a randomised clinical trial comparing an intensive psychodynamic therapy and CBT for patients with medically unexplained pain indicated that both groups achieved reductions in psychological distress, catastrophic thinking and depression; and interventions were deemed to be equally effective at a three month follow up [24]. The CBT group however, demonstrated an improvement in self-efficacy that was not observed in the other group.

In relation to low intensity (brief) interventions, patients attending an IAPT pilot site specifically tailored for long term conditions (LTC)/MUS referrals were offered either a low intensity CBT (guided self-help delivered by a Psychological Wellbeing Practitioner) based intervention, or a mindfulness-based stress reduction treatment (brief, low intensity interventions). Subsequent thematic analysis of qualitative interviews indicated that patients typically reported a positive treatment experience, and felt better able to manage symptoms, even if this was not necessarily reflected by psychometric scores on the Patient Health Questionnaire-9 (PHQ9), Generalised Anxiety Disorder-7 (GAD7), and the WSAS. Although these interventions have been determined as appropriate for these patient groups, it has been suggested in terms of evaluation, that routine outcome measures may not entirely capture the true benefits of interventions [25]. It is also important to consider the clinical implications of these initial findings, namely that there were a higher number of LTC referrals compared with MUS. This may be partly explained by previous reports that GPs feel inadequate and discouraged when dealing with MUS cases [26]. Furthermore, as previously highlighted, research has indicated that MUS patients believe there is disparity between their physical symptoms and a psychological intervention [27]. The difference in referral rates between LTC and MUS patients suggest a need for separate dedicated services for each of these patient groups [28].

1.4 Psychological interventions: NCCP

Current reviews of clinical care have highlighted a failure to appropriately manage NCCP despite the substantial prevalence rates [29]. Studies to date have pointed to the efficacy of CBT [30, 31]. The efficacy of CBT as an intervention for NCCP has been evaluated in a number of randomised controlled trials [32]. A comparison of CBT and standard clinical advice among NCCP patients found major reductions in both the frequency and severity of symptoms in the CBT group, and only modest improvements within the control group [13].

Similarly, an RCT with UCP patients and found that those who had completed a course of CBT had a significantly higher treatment response when compared with placebo and medication groups [30]. A LICBT intervention, more specifically 'coping skills' resulted in significant improvement relating to the catastrophizing of pain symptoms and anxiety when compared to a placebo group [33].

Recent research has also emphasised the success of brief cognitive behavioural therapy, with a three session CBT intervention determined as effective for UCP patients in terms of illness perception [34]. A recent study concluded that a brief cognitive behavioural intervention significantly reduced levels of anxiety and depression in patients with NCCP, with a diagnosis of panic and/or a depressive disorder based on Hospital anxiety and depression scale (HADS) scores [35]. Based on these findings, it was recommended that individuals presenting with NCCP should be assessed for psychopathology, and a cognitive behavioural intervention offered in cases where psychological difficulties are detected. Cognitive behavioural interventions as brief as even a single session initiated within two weeks of an emergency attendance for the primary complaint of chest pain, have also been found to be effective for panic disorder [36]. Furthermore, it has been recommended that increased efforts should be employed to implement these interventions in the emergency department/primary care setting, considering the high prevalence of panic disorder there.

1.5 Psychological interventions: HA/IAD

A recent systemic review and meta-analysis evaluating CBT for health anxiety found a large effect size for CBT compared with several control conditions including standard care, waiting lists, medications and other psychological therapies [37]. In Van Gils et al. [38], another systematic review and met-analysis suggested self-help was associated with significant reduction in symptom severity and improvement in quality of life measures among individuals with MUS [38]. Low intensity interventions which are brief and facilitate flexible delivery have been determined as effective for identified health anxiety within medical settings [39].

1.6 Aims of the current review

A recent study determined that 58.7% of all chest pain presentations to an ED across a three year period resulted in a diagnosis of NCCP [40]. However, care pathways and guidance on the most appropriate interventions for this patient population are very unclear. To date a consolidated and systematic review has not been carried out. In light of these findings, and given the lack of reviews focused on *brief or low intensity* treatments, the purpose of the current review was to assess the effectiveness of brief interventions which may be suitable for these particular and similar patient populations. Given that there is a high prevalence of MUS within primary care with possible associated anxiety, this review sought to examine evidence for brief interventions which may in principle, improve ease of access to appropriate treatment within a stepped care approach, and be implemented at a reduced cost compared with higher intensity or longer term treatments in secondary care. To ensure a more robust assessment, conditions which may exist comorbidly with NCCP were included. Therefore the current review specifically aimed to assess the effectiveness of brief interventions for MUS, illness anxiety disorder,

SSD, HA and NCCP, accounting also for the recent changes in terminologies and diagnostic criteria within the DSM-V.

2. Method

2.1 Eligibility criteria

Studies were assessed for eligibility for inclusion as per the following criteria: (1) written in the English language; (2) published in a journal; (3) included a quantitative evaluation of a brief intervention, with brief defined as ten or fewer individual of group based treatment sessions; (4) interventions were aimed at reducing the frequency and/or impact of MUS, HA, SSD, illness anxiety disorder, or NCCP; (5) participants were over 18 years of age; (6) outcome measures indicated the degree of MUS, and/or psychological wellbeing pre and post intervention; and (7) randomised controlled trial, with control group(s).

2.2 Search strategy

Three databases, specifically Google Scholar, PubMed, and Web of Science were searched for full-text articles which were published in peer reviewed journals. Combinations of the following keywords were used: brief* and intervention*, treatment*, therapy*. The key search terms were (1) medically unexplained symptoms (2) health anxiety, (3) somatic symptom disorder, (4) illness anxiety disorder and (5) non-cardiac chest pain. **Table 1** indicates the complete search strategy employed in Google Scholar advanced searches, which was subsequently modified for the remaining searches. The reference lists of the articles selected from database searches were also examined.

2.3 Study selection and data extraction

Studies were selected by (1) screening the titles; (2) screening the abstracts and methodologies; (3) reviewing the complete paper if the title, abstract and methodologies did not present conclusive evidence that the inclusion criteria were achieved. Studies which did not meet inclusion criteria were subsequently disregarded. Data were extracted according to PRISMA guidelines, onto an Excel workbook which was

Searches
a. brief intervention*
b. brief treatment*
c. or brief therapy*
d. and exact phrase medically unexplained symptoms
e. or somatic symptom disorder (exact)
f. or illness anxiety disorder (exact)
g. or health anxiety (exact)
h. or non-cardiac chest pain (exact)

Table 1.
Search strategy.

used throughout the searches and the review. This was used specifically to record information about study and participant characteristics, details of interventions, outcome measures and analyses.

2.4 Risk of bias

The Cochrane Collaboration Risk of Bias Tool was used in order to assess the risk of bias in the studies selected for the review. This involved screening for bias risk in relation to sequence generation, allocation concealment, blinding of participants and assessors, incomplete data, selective reporting and any other relevant bias. Both authors independently reviewed the selected studies and subsequently agreed on the level of risk of bias as either low, unclear or high.

3. Results

3.1 Study selection

The literature search and search of references from fully screened articles yielded a total of 1674 studies. After removal of duplicates the total was 885. **Figure 1** indicates the process of exclusion and final selection.

3.2 Study characteristics

3.2.1 Location

A summary of the selected studies is presented in **Table 2**. Studies originated in the USA ($n = 6$), Spain ($n = 2$), Germany ($n = 2$), Netherlands ($n = 3$), UK ($n = 4$), Iran ($n = 2$), Norway ($n = 1$), Sweden ($n = 1$) and Canada ($n = 2$). In seven of the studies, the purpose was to evaluate the effect of interventions on medically unexplained symptoms. The remaining studies investigated intervention effects on somatisation ($n = 3$), health anxiety ($n = 2$), hypochondriasis ($n = 2$) and non-cardiac chest pain [10]. All studies considered effectiveness in terms of physical symptoms and psychological wellbeing.

3.3 Participants

All of the included studies involved both male and female participants, and ages ranged from 16 to 81. The total number of participants varied in each of the studies. Eleven of the studies included less than 60 participants, 4 studies included between 61 and 100 participants, 3 studies included between 101 and 150 participants, 4 studies included between 151 and 200 participants and one study involved 444 participants.

3.3.1 Sample size

All studies employed selective sampling methods (purposive), whereby potential participants were initially identified by health professionals prior to subsequent additional eligibility screening using diagnostic interview and psychometric questionnaires. Five studies concurrently used opportunistic sampling methods (through public advertising) prior to the additional screening. Six studies provided some details of power calculations made in order to determine optimum sample sizes. The remaining studies did not describe how sample size was calculated.

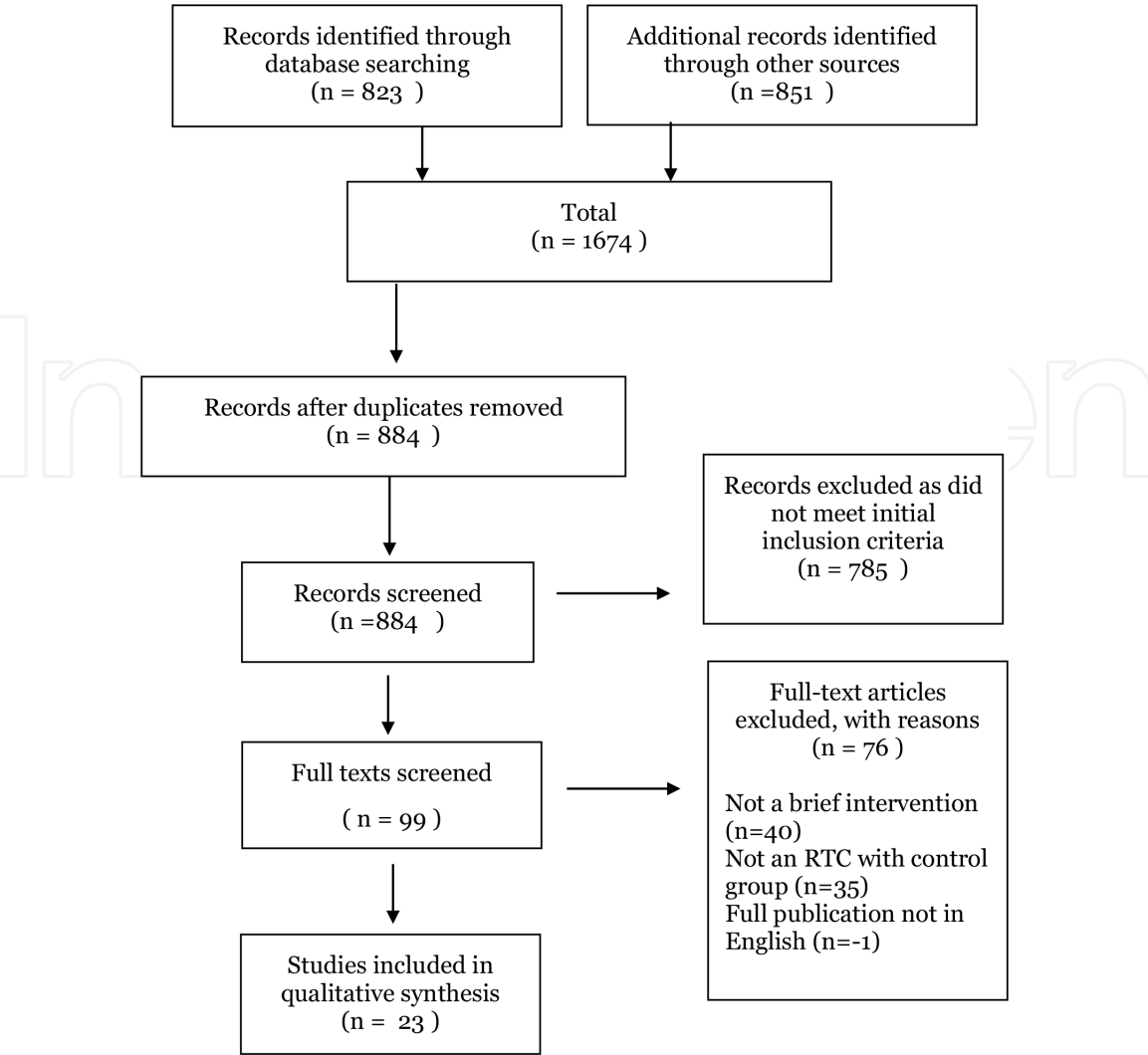


Figure 1.
Prisma flow diagram of search results and selected studies.

3.3.2 Unit of allocation and risk of bias

All of the included studies used random allocation to intervention or control groups. However, one of these studies [41] did not allocate participants in a conventional way, given that they were not actually randomly assigned to conditions, but rather the decision was taken by the authors (for ethical reasons) that the order of the three condition cohorts should be randomly predetermined.

3.3.3 Theoretical basis of the interventions

All of the interventions had a psychological basis. Cognitive behavioural therapy formed the theoretical basis of the interventions in 17 of the studies. Two studies described the intervention as psychosocial and communicative. One study described the intervention as psychophysiological, and one study used a brief psychosomatic intervention. Two studies used relaxation and metaphor therapies. Interventions were delivered as individual sessions in the majority of studies (n = 20), and interventions were delivered in a group basis in the remaining studies (see **Table 2**).

3.3.4 Duration

The studies selected for the current review varied in their duration from six months to four years.

Study	Type of intervention	Duration of session	Duration of treatment	Measures
[45]	Time limited CBT-type	45–60 minutes	Maximum of 10 sessions	CGI-S, CGI-I, VAS, MOS-10, HAM-D, HAM-A
[50]	Psychosocial and communication intervention	30 minutes	Maximum of six sessions	MOS, SF-36, CIDI, PRIME-MD, SLE, NAS
[46]	Single session CBT	3–4 hours	One session	BSI-SOM, SOMS-7 BSI-GSI, WI, BDI, KKG-I
[47]	Time limited CBT	45 minutes	Maximum of 5 sessions	PSC-51, HADS, MOS SF-36
[52]	Time limited psychophysiological intervention	Not specified	Maximum of 10 sessions	CGI-S, HAM-A, HAM-D
[53]	Brief multimodal psychodynamic therapy	45 minutes	Maximum of 9 sessions	VAS, NHL, 4DSQ, SF-36 MAF
[55]	Time-limited mindfulness cognitive therapy	2 hours	Maximum of 8 sessions	DSM-IV (structured clinical interview), SHAI, WI, BAI, BDI
[39]	Time limited CBT	Not specified	5–10 sessions	HADS, SFQ-36, EQ-5D
[59]	Brief psychoeducation based on CBT	1 hour	1 face to face session and 2 brief follow-up phone calls	BDI, STAI, SF-36, WI, SCL-90
[41]	Short-term CBT	60–90 minutes	Maximum of 3 sessions	BSQ, SF-36, BDI, HRQOL
[62]	Relaxation training or metaphor therapy	2 hours	Maximum of 4 sessions	BPI, JIBT
[61]	Guided internet therapy (CBT based)	Not specified	Maximum of 4 sessions	CAQ, BSQ, PHQ-9
[35]	Brief CBT	45 minutes	Maximum of 6 sessions	CGI, HADS, MINI, STAI, FQ
[60]	Brief	1 hour	1 session	Chest Pain Interview, ASI, CAQ, SF-36, BSI
[57]	Time limited CBT	90 minutes	Maximum of 6 sessions	WI, HAI, HCQ, SSI, FSQ, SCL-90, SIS
[63]	Metaphor therapy	2 hours	Maximum of 4 sessions	PDS, DASS,
[58]	Brief CBT or pharmacological treatment	1 hour	Maximum of 7 sessions	ADIS-IV, ACQ, ASI, PAS, BDI, CAQ
[49]	Time limited CBT	Not specified	Maximum of 10 sessions	CGI-SD, SF-36, SSS
[51]	Brief psychosocial	20 minutes	Maximum of 6 sessions	HADS, SF-36, GHQ,-12, SOMS
[36]	Brief panic management (PM) or brief CBT	2 hours (PM) 1 hour (CBT)	1 session (PM) 7 sessions (CBT)	ADIS-IV, BSQ, PAS, ASI, CAQ, ACQ
[54]	Short-term group therapy	2 hours	8 sessions	SF-36

Study	Type of intervention	Duration of session	Duration of treatment	Measures
[42]	Short-term group based educational CBT	90 minutes	6 sessions	IAS, SDIH, BDI, FSS, DAS, QOL, DHBQ, NEO-PI
[43]	Short-term group psychological (CBT based) treatment	2 hours	6 sessions	HADS, NHL, SIP, NHP

SSP: Somatoform Symptoms Scale; **BSI-GSI:** Global Severity Index; **BDI:** Beck Depression Inventory; **KKG-I:** 'Internal Control' Multidimensional Self-Report Questionnaire; **WI:** Whitely Index; **PSC-51:** Physical Symptoms Checklist; **HADS:** Hospital Anxiety And Depression Scale; **NHL:** Nijmegen Hyperventilation List; **4DSQ:** Four-Dimensional Symptom Questionnaire (Distress, Anxiety, Depression, Somatization); **MAF:** Measure of General Functioning; **EQ-5D:** Health Related Quality Of Life; **STAI:** State Trait Anxiety Inventory; **SCL-90:** Symptom Checklist; **BSQ:** Bodily Sensations Questionnaire; **HRQOL:** Health Related Quality of Life; **BPI:** Brief Pain Inventory; **JIBT:** Jones Irrational Belief Test; **PHQ-9:** Patient Health Questionnaire (Depression); **CAQ:** Cardiac Anxiety Questionnaire; **FQ:** Fear Questionnaire; **MINI:** Mini International Neuropsychiatric Interview; **ASI:** Anxiety Sensitivity Index; **HCQ:** Hypochondrial Cognitions Questionnaire; **SSI:** Somatic Symptoms Inventory; **FSQ:** Functional Status Questionnaire; **SIS:** Severity of Illness Scale; **PDS:** Pain Discomfort Scale; **DASS:** Depression, Anxiety, Stress Scale; **PAS:** Panic, Agoraphobia Scale; **ADIS-IV:** Anxiety Disorder Interview Schedule; **SSS:** Severity of Somatic Symptom Scale; **GHQ:** General Health Questionnaire; **SUI:** Summary Utility Index; **ACQ:** Agoraphobic Cognitions Questionnaire; **IAS:** Illness Attitude Scale; **SDIH:** Structured Diagnostic Interview, Hypochondriasis; **FSS:** Fear Survey Schedule; **DAS:** Dysfunctional Attitude Scale; **QOL:** Quality of Life Questionnaire; **DHBQ:** Dysfunctional Health Beliefs Questionnaire; **NEO-PI:** Personality Inventory; **SIP:** Sickness Impact Profile; **NHP:** Nottingham Health Profile.

Table 2.
Key characteristics of selected studies.

3.3.5 Control conditions

The vast majority of the selected studies (n = 21), employed a ‘treatment as usual’ control condition. The remaining 2 studies [42, 43] employed ‘waiting list’ control conditions.

3.4 Interventions: Description and impact

3.4.1 MUS/SSD

3.4.1.1 Brief CBT

The cognitive behavioural model considers predisposing, precipitating and perpetuating factors [44]. Psychological distress may be triggered and maintained in individuals with physical health symptoms via a cycle of inaccurate perceptions, avoidance behaviours and subsequent intensification of symptoms. Four of the selected studies included brief CBT based interventions targeting MUS/SSD. One of these, assessed the effectiveness of a 10 session treatment (averaging 50 minutes duration), which had been modified to target somatization problems. More specifically it applied relaxation training, emotional awareness, cognitive restructuring (CR) and communication [45]. Another study facilitated a single session (3–4 hours) which focused primarily on developing psychophysiological explanations of symptoms, relaxation, cognitions and healthcare use [46]. The third of these studies based their brief CBT intervention on the Consequences model within which the focus is on the consequences as opposed to the causes of physical symptoms; applied techniques aim to alter the consequences of symptoms [47, 48]. Participants were offered a maximum of 5, 45 minute sessions. The final study

assessing brief CBT for MUS, offered a 10 session manualized intervention adapted for somatization disorder aimed at coping with stress and physical discomfort [49].

Of the five studies which implemented brief CBT interventions targeting MUS/SSD, significant effects were observed in three whereby the intervention was deemed to be effective relative to control groups. No significant effects were observed in one study. One study reported medium effect sizes, and found that the intervention group had a higher percentage of patients with 'very much' or 'much' improved physical symptoms as reported by blinded evaluators (60% vs. 25.8% odds ratio = 4.1; 95% CI, 1.9–8.8; $p < .001$). There was a significant improvement in the intervention vs. the control group ($p < 0.5$) for depressive symptoms. Effects however were no longer noticeable at six month follow-up [45]. Small to medium effect sizes were observed in another study and a stronger effect size was detected for the intervention group in relation to reduction of doctors' visits ($\eta^2 = 0.031$), and the reduction of somatization severity ($\eta^2 = 0.048$). Although significant improvements in all other measures were observed for both groups, all participants were still highly impaired with the degree of somatization, health anxiety and depression all above clinical thresholds at a six month follow-up. [46]. One study observed large effect sizes and found that somatization symptoms were significantly improved in the intervention group relative to the control group ($p < 0.01$), with the intervention also associated with improved self-reported functioning [49]. The remaining study determined that the intervention was not more effective than care as usual, although approximately 30% of participants in both groups demonstrated improvements on the clinically relevant outcomes [47].

3.4.1.2 Brief psychosocial interventions

Two of the included studies used psychosocial and communication interventions targeting MUS/SSD. One study trained GPs to explain symptoms in a physical tangible way as result of hormone imbalance, to subsequently attribute this imbalance to irrational thinking, and to explore psychosocial issues indirectly. Participants were offered six sessions of 30 minutes [50].

Similarly, the second study trained GPs to gather a thorough psychosocial history, evaluate subjective understanding, demonstrate empathy, explain the relationship between symptoms and emotional distress, use symptom diaries, identify stressors and develop new behaviours; six 20 minute sessions were offered [51].

The first study, observed small to medium effect sizes and large effects sizes for bodily pain, social and emotional functioning, and mental health [50]. More specifically, quality of life dimensions in the intervention group were significantly improved relative to the control group in relation to several SF-36 subscales, namely bodily pain ($p < 0.03$), mental health ($p < 0.063$), physical functioning ($p < 0.01$), vitality ($p < 0.039$), social functioning ($p < 0.033$), and utility index ($p < 0.039$). The second study [51] found significant improvements were observed for the intervention group relative to the control group in relation to a reduction of physical symptoms ($p = 0.07$), reduction of depression ($p = 0.211$) and reduction of anxiety ($p = 0.388$). Effect sizes however were modest and were not maintained at six month follow up.

3.4.1.3 Brief psychophysiological interventions

One of the selected studies used a brief psychophysiological intervention targeting MUS/SSD. This was a ten session manualized treatment designed specifically for MUS; it was described as a treatment to assist with stress and physical discomfort, and specific components were emphasised depending on individual symptoms profiles [52].

3.4.1.4 Brief multimodal psychosomatic therapy

One study used a brief multimodal psychosomatic therapy targeting MUS. The treatment is based on the biopsychosocial model and involved relaxation, mindfulness, CBT techniques and activation therapy; up to 9 sessions of 45 minutes duration were offered [53].

At 12 months post intervention, improvement in perceived symptom severity was observed [adjusted mean difference -2.0 , 95% confidence interval (CI) -3.6 to -0.3], in somatization (adjusted mean difference -4.4 , 95% CI -7.5 to -1.4) and in symptoms of hyperventilation (adjusted mean difference -5.7 , 95% CI -10.5 to -0.8). Although the small sample size was deemed to be efficient, the authors concluded that a larger trial would be helpful and feasible. This pilot trial was not powered to indicate treatment effect size.

3.4.1.5 Brief group therapy

One study, implemented a short-term group therapy for MUS/SSD (8 sessions of 2 hour durations), within which the aims were to develop peer support, share coping strategies and improve perceptions and expressions of emotions [54].

In relation to a brief group therapy, the intervention group demonstrated significant improvements compared with the control group on both physical health ($p < 0.05$), and mental health ($p < 0.01$) at post-treatment and at 12 month follow-up. Treatment effect sizes were not indicated.

3.4.2 HA/IAD

3.4.2.1 Brief CBT

Four of the included studies implemented brief CBT interventions targeting HA/IAD. The first offered 5–10 sessions of brief CBT which had been adapted for HA [39]. Similarly, another of the studies, employed a 6 session individualised intervention which was designed specifically to target and restructure hypochondriacal thoughts [9]. One study implemented a time-limited group mindfulness-based CBT intervention, which was described a skills training programme adapted for HA [55–56]. A group based intervention was also employed in another study. This took the form of an educational course aimed at improving coping skills for HA, focused specifically on selective attention, muscle tension, breathing, environmental factors, stress, mood and explaining somatic symptoms [42].

Four of the included studies implemented brief BCT interventions targeting HA/IAD and all reported significant effects for intervention groups relative to control groups. More specifically, one determined small effect sizes, and found that at 12 month follow-up point, the intervention group demonstrated an improvement in health anxiety symptoms which was 2.98 points greater than the control group and these symptomatic improvements were maintained at 2 years follow up. However, there were no significant differences between groups in relation to social functioning or health related quality of life [39]. At a 12-month follow-up, another study found significantly lower levels of hypochondriacal symptoms, beliefs, and attitudes ($P < .001$) and health-related anxiety ($P = .009$) in the intervention group. Furthermore significantly less impairment of social role functioning ($P = .05$) and intermediate activities of daily living ($P < .001$) were also observed. Effect sizes were reported as small to medium and hypochondriacal somatic symptoms were not improved significantly by treatment. The third of these studies determined

medium effect sizes; their intervention group demonstrated significantly lower health anxiety than the control group both immediately following treatment ($d = 0.48$), and at a 12 month follow-up ($d = 0.48$) [55]. In the final study significant improvement was observed in the intervention group relative to the control group on all measures including physical symptoms ($p = 0.03$), dysfunctional health beliefs ($p = 0.02$), vulnerability ($p = 0.03$) and lack of control ($p = 0.06$); effect sizes were not reported [42].

3.4.3 NCCP

3.4.3.1 Brief CBT

Seven of the selected studies involved brief CBT based interventions targeting NCCP. One of these implemented a 7 session treatment which incorporated psychoeducation on chest pain, panic disorder (PD), exposure and CR [58]. Two interventions were evaluated in another study [36], namely a single session panic management intervention and a 7 session CBT treatment for NCCP and PD [36]. Another also trialled a single individualised information session with psychoeducational materials [59]. One study used a single session of brief CBT (60 minute duration) which included psychoeducation, breathing exercises and CR [62]. Psychoeducation was again a component of the intervention offered in another of the studies, which also included CR, and strategies to influence avoidance behaviours over 6 sessions of 45 minutes [35]. One study offered a 3 session programme (60–90 minutes) which focuses on the CBT model of panic and exposure therapy [41]. Guided brief CBT was delivered online in another study and involved 4 sessions of psychoeducation, physical activity advice and relaxation [61].

Of the seven selected studies which implemented brief CBT based interventions targeting NCCP, five reported significant effects for interventions relative to control groups and two observed no significance. Large treatment effect sizes were observed in one study; both intervention groups demonstrated significant improvements relative to the control group in relation to the severity of panic disorder ($p = 0.12$), frequency of panic ($p = 0.48$), and depressive symptoms ($p = 0.27$) [58]. Similarly large effect sizes were also observed in another study; both interventions also achieved significant reductions in the severity of panic disorder relative to the control group ($\eta^2 = 0.07$), although no superiority was demonstrated by one intervention as compared with the other [36]. Medium effect sizes with significant improvements for the intervention versus control in relation to frequency and fear of chest pain, and anxiety sensitivity, but not in relation to severity of chest pain, quality of life and psychological distress were determined on one study [60]. In another study, significant improvements were observed for intervention versus control group in relation to reduction of disease severity, anxiety and depression symptoms but effect sizes were not determined [35]. A brief CBT intervention was effective compared to care as usual and reported medium to large effect sizes. Significant differences were observed for fear of bodily sensations, avoidance of physical activities and depression. However, the sample size was small and no power analysis was carried out [41]. Another study concluded that although improvements were demonstrated by both intervention and control groups in relation to cardiac anxiety, fear of bodily sensations and depression, no significant differences were observed between the groups [61]. Similarly, the remaining study found that although both groups achieved slight improvements on the main outcomes,

specifically chest pain, mood and limitation of activities, no significant effects were observed [59].

3.4.3.2 Relaxation and metaphor therapy

Two studies evaluated relaxation and metaphor therapies targeting NCCP [62, 63]. Both treatments consisted of 4 2 hour sessions. The relaxation therapy was group based involving learning and practising relaxation and breathing techniques. Metaphor therapy involved challenging and connecting metaphoric stories of hopelessness, with the ultimate goal of challenging unhelpful beliefs.

The first of these reported small to medium effect sizes, and determined significant differences between the relaxation group and both control groups for hopelessness (DM = 9.79, $p < 0.05$), pain severity (DM = 1.96, $p < 0.05$), and emotional irresponsibility (DM = 4.80, $p < 0.05$). No significant effects were observed in relation to the metaphor therapy intervention group [62]. The subsequent study assessed the effectiveness of metaphor therapy only, and again determined no significant treatment effects relative to the control group [63].

3.4.3.3 Short-term group therapy

One study implemented a short-term (8 session of 2 hours) group therapy for NCCP within which the focus was on sharing experiences and coping strategies, education on chest pain, relaxation and breathing exercise, physical exercise, CR and graded exposure [43]. Significant improvements were observed in the intervention group relative to the control group in relation to chest pain episodes ($p < 0.01$) and anxiety and depression ($p < 0.05$), with benefits maintained at a six month follow-up. Treatment effect sizes were not indicated.

3.5 Delivery of the intervention

Therapists trained specifically in the relevant interventions were used in eleven of the studies. Primary care physicians (GPSs) delivered interventions in four of the studies, and four of the studies used clinical psychologists to deliver treatments. Cardiac nurses delivered interventions in two studies.

3.6 Outcome measures

Several combinations of primary and secondary outcome measures including questionnaires and diagnostic interviews were used in the selected studies at pre, post and follow-up points. The measures assessed medically unexplained symptoms, mental health, health related quality life and general functioning. The most frequently used outcome measure was the MOS SF-36 (medical outcomes study 36 item short-form health survey), which was used in ten of the selected studies. A full list of the outcome measures used in each of the included studies is presented in **Table 2**. Intervention effects are presented in **Table 3**.

3.7 Pre, post and follow-up data

The majority of the studies ($n = 17$) included in the review adapted longitudinal designs and evaluated outcomes at pre and post intervention points and at one or more follow-up points. Six of the included studies evaluated outcomes at pre and post intervention points only and did not use a longitudinal design.

Study	Intervention	Outcomes
[45]	Time limited CBT type therapy delivered in primary care for patients with medically unexplained physical symptoms	The intervention group had a higher percentage of patients with ‘very much’ or ‘much’ improved physical symptoms as reported by blinded evaluators (60% vs. 25.8% odds ratio = 4.1; 95% CI, 1.9–8.8; $p < 0.001$). There was a significant improvement in the intervention vs. the control group ($p < 0.5$) for depressive symptoms. Effects were no longer noticeable at six month follow-up. Effect sizes medium.
[50]	A psychosocial and communication intervention delivered by GPs for patients with medically unexplained symptoms.	Improvements in all dimensions of the SF-36 were demonstrated by patients in both groups. The intervention group demonstrated significantly more improvement in bodily pain, mental health, physical functioning, social functioning and vitality ($p < 0.039$). Effect sizes: small to medium (large effect sizes for bodily pain, social and emotional functioning and mental health).
[46]	A one session CBT intervention for medically unexplained symptoms delivered by clinical psychologist	There was a stronger effect size in the intervention group in relation to reduction of doctors’ visits ($\eta^2 = 0.031$), and the reduction of somatization severity ($\eta^2 = 0.048$). Although significant improvements in all other measures were observed for both groups, all participants were still highly impaired with the degree of somatization, health anxiety and depression all above clinical thresholds at a six month follow-up. Effect sizes: small to medium
[47]	Cognitive behavioural treatment delivered by family physician for medically unexplained symptoms	The intervention was not more effective than care as usual; approximately 30% of participants in both groups demonstrated improvements on the clinically relevant outcomes. No significance observed: intervention not effective as compared with control group. Effect sizes: N/A.
[52]	Psychophysiological treatment (described to participants as an intervention to assist in coping with physical comfort and distress) delivered by psychologists	There was a significantly greater improvement in the frequency and severity of physical symptoms in the interventions group ($p < 0.05$). Effect sizes also indicated a greater improvement in the interventions group for depression symptoms ($d = 0.81$)
[53]	Brief multimodal psychodynamic therapy for medically unexplained symptoms delivered by trained practitioners.	Significant differences between groups were observed at 12 month follow up; the intervention group demonstrated greater improvement in perceived symptom severity, somatization and hyperventilation. Effect sizes: unknown (trial not powered to indicate treatment effect sizes)
[55]	Time-limited mindfulness-based cognitive therapy for health anxiety delivered by trained practitioners and clinicians.	The intervention group demonstrated significantly lower health anxiety than the control group both immediately following treatment ($d = 0.48$), and at a 12 month follow-up ($d = 0.48$). Effect sizes: medium
[39]	CBT for health anxiety delivered by trained health professionals	At a 12 month follow-up point, the intervention group demonstrated an improvement in health anxiety symptoms which was 2.98 points greater than the control group. Significance observed: intervention effective as compared with control group. Effect sizes small

Study	Intervention	Outcomes
[59]	Brief psychoeducational and cognitive behavioural intervention for non-cardiac chest pain, delivered by cardiac nurses	Although both groups achieved slight improvements on the main outcomes, specifically chest pain, mood and limitation of activities, no significant effects were observed. Effect sizes: NA
[41]	Short-term CBT for non-cardiac chest pain delivered by trained therapists.	The intervention was effective compared to care as usual; significant differences were observed for fear of bodily sensations, avoidance of physical activities and depression. Effect sizes medium to large
[63]	Relaxation training versus metaphor therapy for non-cardiac chest pain delivered by clinical psychologists.	There were significant differences observed between the relaxation group and both control groups for hopelessness (DM = 9.79, $p < 0.05$), pain severity (DM = 1.96, $p < 0.05$), and emotional irresponsibility (DM = 4.80, $p < 0.05$). Effect sizes small to medium.
[61]	Guided internet therapy (CBT based) for non-cardiac chest pain delivered by cardiac nurses	Although improvements were demonstrated by both groups in relation to cardiac anxiety, fear of bodily sensations and depression, no significant differences were observed between the groups. No significance observed. Effect sizes: N/A
[35]	Brief CBT for non-cardiac chest pain with associated depression and panic disorder delivered by clinical psychologists	Significant improvements were observed for intervention versus control group in relation to reduction of disease severity, anxiety and depression symptoms. Effect sizes: unknown (trial not powered to indicate treatment effect sizes.
[60]	Brief CBT for non-cardiac chest pain	Significant improvements were observed for intervention versus control in relation to frequency and fear of chest pain, and anxiety sensitivity, but not in relation to severity of chest pain, quality of life and psychological distress. Effect sizes: medium
[57]	CBT for hypochondriasis delivered by trained therapists	Significant differences were observed for the intervention group versus control group in relation to hypochondrial symptoms, beliefs and attitudes, health anxiety, and social functioning. Effect sizes: small to medium
[63]	Metaphor therapy for non-cardiac chest pain delivered by psychologists	There were no significance differences demonstrated by the intervention group compared with control group on any of the outcome variables (depression, anxiety, stress and pain discomfort). No significance observed: intervention not effective as compared with control group Effect sizes: NA
[58]	Brief CBT or pharmacological treatment for non-cardiac chest pain with associated panic disorder delivered by psychologists.	Both intervention groups demonstrated significant improvement relative to the control group in relation to the severity of panic disorder ($p = 0.12$), frequency of panic ($p = 0.48$), and depressive symptoms ($p = 0.27$). Effect sizes large.
[49]	Time limited CBT for somatization disorder	Somatization symptoms were significantly improved in the intervention group relative to control group ($p < 0.01$). Effect sizes large.

Study	Intervention	Outcomes
[51]	Psychosocial intervention for somatising patients delivered by general practitioners	Significant improvements were observed for the intervention group relative to the control group in relation to a reduction of physical symptoms ($p = 0.07$), reduction of depression ($p = 0.211$) and reduction of anxiety ($p = 0.388$). Effects were not maintained at six month follow up. Effects not maintained at 6 month follow-up. Effect sizes small
[36]	Brief psychological interventions (panic management and CBT) for panic disorder with non-cardiac chest pain delivered by trained therapists.	Both interventions demonstrated significant reductions in the severity of panic disorder relative to the control group ($\eta^2 = 0.07$) although no superiority was demonstrated by one intervention as compared with the other. Effect sizes large (time)
[54]	Short-term group therapy for somatization disorder delivered by trained therapists	The intervention group demonstrated significant improvements relative to the control group on both physical health ($p < 0.05$), and mental health ($p < 0.01$) at post-treatment and at 12 month follow-up. Effect sizes: Unknown (trial not powered to indicate treatment effect sizes)
[42]	Short-term group therapy (CBT based) for hypochondriasis delivered by trained therapists	Significant improvements were observed in the intervention group relative to the control group on all measures including physical symptoms ($p = 0.03$), dysfunctional health beliefs ($p = 0.02$), vulnerability ($p = 0.03$) and lack of control ($p = 0.06$). Effect sizes unknown (trial not powered to indicate treatment effect sizes)
[43]	Time limited group psychological treatment for non-cardiac chest pain delivered by trained therapists	Significant improvements observed in the intervention group relative to the control group in relation to chest pain episodes ($p < 0.01$) and anxiety and depression ($p < 0.05$), with benefits maintained at a six month follow-up. Effect sizes: Unknown (trial not powered to indicate treatment effect sizes).

Table 3.
Summary of results for included studies.

4. Discussion

4.1 Summary of evidence

This is the first systematic review which examined evidence for brief or time-limited interventions for both MUS/SSD, HA/IAD and NCCP specifically. Significant effects for the intervention groups relative to control groups were reported in 19 studies, and 4 studies did not determine any significant benefits of interventions compared with control groups. Significant effects relative to controls were determined for all of the brief interventions in at least one study (CBT, psychosocial, psychophysiological, psychosomatic, relaxation and group therapy), with the exception of metaphor therapy for which no significant effects were reported. [63]. Of those studies reporting significance, large treatment effects were reported in 3 [39, 49, 58], medium effect sizes were reported by 3 [45, 55, 60], medium to large effects were reported in 2 [34, 52], four studies observed small to medium effect sizes [46, 50, 57, 62], and small effect sizes were determined in 2 [39, 51]. Five studies did not indicate effect sizes (see **Table 3**). All of the studies within which the largest effect sizes were reported, involved brief CBT for either MUS or NCCP [36, 49, 58].

There are several possible explanations for the lack of effect on medically unexplained symptoms and psychological wellbeing in the trials within which no significance was observed. The findings specifically, that time limited CBT delivered by GPs for MUS did not result in significantly better outcomes than care as usual, are consistent with other research which has outlined the limited feasibility and effectiveness of CBT for MUS delivered by primary care doctors [47, 64, 65].

Although it was found that brief online CBT guided by cardiac nurses was feasible for NCCP given that it decreased cardiac anxiety, frequency of chest pain and depression symptoms, no significant differences were observed relative to the control group [61]. These findings were comparable with another study where no significant treatment effects were determined after a brief single session CBT intervention for NCCP again delivered by cardiac nurses [59]. Authors of both studies have highlighted the limitations of small sample sizes and recruitment difficulties, possibly due to the fact that patients found it difficult to reject a physical explanation for the cause of chest pain. As outlined earlier, previous research has suggested that individuals with MUS have a tendency to reject psychological constructs of their problems resulting in an unwillingness to engage in psychological treatments [8, 16–18].

Regarding the use of metaphor therapy for NCCP after which no significant benefits were observed in terms of discomfort, anxiety or depression, the authors suggested that the nature of the intervention itself may not be suitable given that it is dependent on an individual's ability to visualise [62, 63]. However, some evidence exists to support the use of this intervention, and it was a component of a group psychological intervention for NCCP included in the current review within which significant treatment effects were observed [43].

Some included studies reported significant treatment effects compared with controls after brief CBT for MUS/SSD [45, 46, 49]. As previously highlighted, findings in one indicated a more marked reduction in the amount of doctor's visits and in the severity of somatization in the CBT group compared with the standard care group [46]. Although actual treatment effects were smaller for this single session intervention when compared with more intensive CBT approaches, brief interventions still facilitate the treatment of a greater number of MUS patients. It has been suggested that brief intervention could improve the general management of MUS at the primary care level and subsequently aid access to more specialist interventions if clinically required. Furthermore, the importance of early intervention should be highlighted given that the condition becomes much less manageable and complex over time [9]. It has been suggested that a brief treatment such as a single session CBT/LICBT intervention could be an appropriate and effective first point of treatment within a stepped care approach in order to improve management of MUS [46, 66].

4.2 Variations in outcomes

Differences in the outcomes observed in the selected studies, may be a result of variations in the components and theoretical frameworks of the interventions, the duration of the interventions, sampling issues, the selection strategies employed to recruit participants, the outcome measures used to determine MUS and psychological wellbeing, the experience levels of persons delivering the interventions, and how data was collected and analysed.

The psychological framework of the interventions evaluated in the selected studies included CBT, psychosocial, psychosomatic, relaxation, metaphor, and general group therapy. Significant effects at the post-intervention stage (at least), were reported by all included studies except 3 studies which implemented brief CBT, and 2 studies which implemented brief metaphor therapy.

However, 13 studies did determine significant effects for brief CBT, as did both studies which used psychosocial treatments. Furthermore each of the single studies evaluating either psychosomatic, relaxation or general group therapy also reported significance. It is not possible therefore to concretely conclude if one of these brief interventions might offer superior benefits to the other, given the more limited available outcomes from trials assessing interventions other than those which are CBT based. Rather, it may be concluded that some evidence exists to support the use of all of the interventions for medically unexplained symptoms and associated psychological distress, with the exception of metaphor therapy. More specifically there is substantial evidence within the current review supporting the use of brief/time-limited CBT, and existing but more limited evidence supporting the use of the remaining included interventions.

Several studies highlighted issues with sampling and sampling size, which might have influenced outcomes. Despite screening 6409 potential participants, only 65 were included in the trial for one study [47]. Some were excluded due to a natural reduction of symptoms or due to the presence of severe and comorbid conditions. Chronic issues with somatization are likely to follow a path of highs and lows in relation to the severity of and response to symptoms, much like depression and anxiety disorders, however, a majority of eligible participants declined the intervention as they had 'accepted' symptoms were part of their life.

As indicated earlier, there was a large variation in sample size in the selected studies. Eleven of the studies included 60 or fewer participants, and one study included 444 participants. Given that the power of the study may be affected by a sample which is either too large or small, it is reasonable to suppose that at least some of the included studies may have been under-powered to clearly indicate between-group differences of statistical significance [67, 68].

The selection of an appropriate outcome measure is an important consideration which can impact the value of results from clinical studies. Selection of measures has tended to concentrate more on the psychometric properties, but less on the actual suitability of the instruments for their intended purpose. It has been suggested that in addition to an evaluation of basic psychometric properties, researchers should consider that different instruments may capture different aspects of complex phenomena and may therefore not be equally valid for everyone. Furthermore, a good fit between the measure and what the researcher expects to change post treatment is required to facilitate a valid interpretation of the outcomes. As indicated earlier, a considerably large variety of primary and secondary outcome measures were included in the selected studies, and it may be the case that not all of those were the optimum instruments [69].

The interventions evaluated in the selected studies were delivered by either therapists who had been trained specifically in the relevant interventions, GPs, clinical psychologists, or cardiac nurses. Both studies using cardiac nurses reported no significant intervention effects, and 2 of the 4 studies within which interventions were delivered by GPs also reported no significant intervention effects. A systematic review and meta-analysis of randomised controlled trials of psychological treatments found psychological interventions were more beneficial when delivered by psychotherapists compared with GPs, and more specifically that psychotherapists had a greater effect on physical symptoms than GPs [70]. An earlier systematic review considered the prevalence of medically unexplained physical symptoms, the extent of comorbidity with psychiatric disorders, the importance of psychological processes and the effectiveness of interventions. It was reported that there was significant overlap between symptoms and syndromes, and that patients with MUS should therefore be considered as having complex adaptive systems within which cognitive, physiological and

environmental factors interact. CBT and antidepressants are effective, however these benefits are heightened when patients feel empowered by their own doctors to address their problems [71]. The importance of the GP role was consequently highlighted i.e. to validate the patient experience, provide positive and empowering explanations of symptoms and to offer evidence based interventions including CBT. Further research has suggested that GP-patient interactions did impact consultation and communication patterns but did not subsequently impact patient outcomes [72].

It is also important to acknowledge that while the current review focused on time-limited intervention, the duration of the course of treatments evaluated in the included studies ranged from a single session to ten sessions, with sessions also varying in length in addition to varying times between sessions, and the point at which follow up data was collected. The potential impact of this on outcomes cannot be disregarded. In order to reach more robust conclusions regarding the confounding factors which impact clinical outcome in MUS, larger sample sizes and longer follow-ups should be employed, given the effects of clustering and generally modest effects observed.

There are other methodological issues to consider including that there were a variety of methodologies employed in relation to data analysis. Not all of the included studies reported specifically how data was cleaned or how missing data was handled, and there is a possibility this may account for variability between outcomes. Furthermore, some studies employed power analysis and reported effect sizes, and some did not. It is therefore recommended that any future trial addresses this methodological weakness in order to improve and determine the most effective treatment.

4.3 Risk of bias

All of the included studies employed random allocation to intervention or control group, although many lacked precise details regarding how this was achieved, and the risk of bias remained unclear in several studies.

4.4 Strengths and limitations

The main strength of this systematic review is the focus on brief interventions which are feasible to offer as part of a stepped care approach. A limitation is that the included studies were screened by only one author (except for risk of bias examination), increasing the possibility that a study might have been missed.

5. Conclusion

The evidence suggests that brief psychological interventions, more specifically time limited BCT based interventions may have small to large effects in reducing the severity of MUS and associated psychological distress. These findings are comparable with other reviews which have assessed the efficacy of higher intensity and/or longer term interventions. Given that there is a broad range of symptom severity and willingness to engage in psychological treatments among MUS patients in primary care, it is reasonable to suggest that a stepped care approach may be suitable thereby facilitating a more specialist intervention in chronic cases [73–75]. However, there remains a need to provide more robust evidence of cost effectiveness in relation to mild and moderate cases for which briefer interventions such as those evaluated here, tend to be recommended.

IntechOpen

IntechOpen

Author details

Orla McDevitt-Petrovic* and Karen Kirby
School of Psychology, Ulster University, United Kingdom

*Address all correspondence to: om.mcdevitt-petrovic@ulster.ac.uk

IntechOpen

© 2020 The Author(s). Licensee IntechOpen. This chapter is distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/3.0>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited. 

References

- [1] Salmon P. Conflict, collusion or collaboration in consultations about medically unexplained symptoms: the need for a curriculum of medical explanation. Patient education and counseling. 2007 Aug 1;67(3):246-54.
- [2] Creed FH, Davies I, Jackson J, Littlewood A, Chew-Graham C, Tomenson B, Macfarlane G, Barsky A, Katon W, McBeth J. The epidemiology of multiple somatic symptoms. Journal of psychosomatic research. 2012 Apr 1;72(4):311-7.
- [3] Marks EM, Hunter MS. Medically unexplained symptoms: an acceptable term?. British journal of pain. 2015 May;9(2):109-14.
- [4] American Psychiatric Association. Diagnostic and statistical manual of mental disorders (DSM-5®) (2013) American Psychiatric Pub. <https://doi.org/10.1176/appi.books.9780890425596>
- [5] Kirmayer LJ, Groleau D, Looper KJ, Dao MD. Explaining medically unexplained symptoms. The Canadian journal of psychiatry. 2004 Oct;49(10):663-72.
- [6] Creed F, Barsky A. A systematic review of the epidemiology of somatisation disorder and hypochondriasis. Journal of psychosomatic research. 2004 Apr 1;56(4):391-408.
- [7] Gureje O, Üstün TB, Simon GE. The syndrome of hypochondriasis: a cross-national study in primary care. Psychological Medicine. 1997 Sep;27(5):1001-10.
- [8] Nezu AM, Nezu CM, Lombardo ER. Cognitive-behavior therapy for medically unexplained symptoms: a critical review of the treatment literature. Behavior Therapy. 2001 Jun 1;32(3):537-83.
- [9] Barsky AJ, Orav EJ, Bates DW. Somatization increases medical utilization and costs independent of psychiatric and medical comorbidity. Archives of general psychiatry. 2005 Aug 1;62(8):903-10.
- [10] Department of Health. No health without mental health: a cross-government mental health outcomes strategy for people of all ages (2011) Retrieved from <https://www.gov.uk/government/publications/no-health-without-mental-health-a-cross-government-outcomes-strategy>
- [11] Department of Health. No health without mental health: a cross-government mental health outcomes strategy for people of all ages (2008) Retrieved from <https://www.gov.uk/government/publications/no-health-without-mental-health-a-cross-government-outcomes-strategy>
- [12] Trivedi MH. The link between depression and physical symptoms. Primary care companion to the Journal of clinical psychiatry. 2004;6(suppl 1):12.
- [13] Mayou RA, Bryant BM, Sanders D, Bass C, Klimes I, Forfar C. A controlled trial of cognitive behavioural therapy for non-cardiac chest pain. Psychological medicine. 1997 Sep;27(5):1021-31.
- [14] Smeijers L, van de Pas H, Nyklicek I, Notten PJ, Pedersen SS, Kop WJ. The independent association of anxiety with non-cardiac chest pain. Psychology & health. 2014 Mar 4;29(3):253-63.
- [15] Von Korff M, Crane P, Lane M, Miglioretti DL, Simon G, Saunders K, Stang P, Brandenburg N, Kessler R. Chronic spinal pain and physical-mental comorbidity in the United States: results from the national comorbidity survey replication. Pain. 2005 Feb 1;113(3):331-9.

- [16] Chew-Graham C, Brooks J, Wearden A, Dowrick C, Peters S. Factors influencing engagement of patients in a novel intervention for CFS/ME: a qualitative study. *Primary health care research & development*. 2011 Apr;12(2):112-22.
- [17] Shaw, J., & Creed, F. The cost of somatization. *Journal of psychosomatic research*, 35(2), 307-312. 1991 [https://doi.org/10.1016/0022-3999\(91\)90085-3](https://doi.org/10.1016/0022-3999(91)90085-3)
- [18] Sumathipala A. What is the evidence for the efficacy of treatments for somatoform disorders? A critical review of previous intervention studies. *Psychosomatic medicine*. 2007 Nov 1;69(9):889-900.
- [19] Speckens AE, Van Hemert AM, Bolk JH, Rooijmans HG, Hengeveld MW. Unexplained physical symptoms: outcome, utilization of medical care and associated factors. *Psychological medicine*. 1996 Jul;26(4):745-52.
- [20] Malouff, J. M., Thorsteinsson, E. B., Rooke, S. E., Bhullar, N., & Schutte, N. S. Efficacy of cognitive behavioral therapy for chronic fatigue syndrome: a meta-analysis. *Clinical psychology review*, 28(5), 736-745 . 2008 <https://doi.org/10.1016/j.cpr.2007.10.004>
- [21] Moss-Morris R, McAlpine L, Didsbury LP, Spence MJ. A randomized controlled trial of a cognitive behavioural therapy-based self-management intervention for irritable bowel syndrome in primary care. *Psychological medicine*. 2010;40(1):85.
- [22] Van Dessel, N., Den Boeft, M., van der Wouden, J. C., Kleinstäuber, M., Leone, S. S., Terluin, B., ... & van Marwijk, H. (2014). Non-pharmacological interventions for somatoform disorders and medically unexplained physical symptoms (MUPS) in adults. *Cochrane Database Syst Rev*, 11. doi: 10.1002/14651858.CD011142.pub2.
- [23] Kroenke K, Swindle R. Cognitive-behavioral therapy for somatization and symptom syndromes: a critical review of controlled clinical trials. *Psychotherapy and psychosomatics*. 2000;69(4):205-15.
- [24] Chavooshi B, Mohammadkhani P, Dolatshahee B. Telemedicine vs. in-person delivery of intensive short-term dynamic psychotherapy for patients with medically unexplained pain: A 12-month randomized, controlled trial. *Journal of telemedicine and telecare*. 2017 Jan;23(1):133-41.
- [25] Gerskowitch C, Norman I, Rimes KA. Patients with medically unexplained physical symptoms experience of receiving treatment in a primary-care psychological therapies service: a qualitative study. *The Cognitive Behaviour Therapist*. 2015;8.
- [26] Wileman L, May C, Chew-Graham CA. Medically unexplained symptoms and the problem of power in the primary care consultation: a qualitative study. *Family Practice*. 2002 Apr 1;19(2):178-82.
- [27] Unigwe, C., Rowett, M. and Udo, I. Reflections of the management of medically unexplained symptoms. *British Journal of Psychiatry Bulletin*, 2014.38, 252. <https://dx.doi.org/10.1192%2Fpb.38.5.252>
- [28] Kellett S, Webb K, Wilkinson N, Bliss P, Ayers T, Hardy G. Developing services for patients with depression or anxiety in the context of long-term physical health conditions and medically unexplained symptoms: evaluation of an IAPT pathfinder site. *Behavioural and cognitive psychotherapy*. 2016 Sep 1;44(5):553.
- [29] Chambers JB, Marks EM, Russell V, Hunter MS. A multi-disciplinary, biopsychosocial treatment for non-cardiac chest pain. *International journal of clinical practice*. 2015 Sep;69(9):922-7.

- [30] Spinhoven P, Van der Does AW, Van Dijk E, Van Rood YR. Heart-focused anxiety as a mediating variable in the treatment of noncardiac chest pain by cognitive-behavioral therapy and paroxetine. *Journal of psychosomatic research*. 2010 Sep 1;69(3):227-35.
- [31] Marchand A, Belleville G, Fleet R, Dupuis G, Bacon SL, Poitras J, Chauny JM, Vadeboncoeur A, Lavoie KL. Treatment of panic in chest pain patients from emergency departments: efficacy of different interventions focusing on panic management. *General hospital psychiatry*. 2012 Nov 1;34(6):671-80.
- [32] George N, Abdallah J, Maradey-Romero C, Gerson L, Fass R. the current treatment of non-cardiac chest pain. *Alimentary pharmacology & therapeutics*. 2016 Jan;43(2):213-39.
- [33] Keefe FJ, Shelby RA, Somers TJ, Varia I, Blazing M, Waters SJ, McKee D, Silva S, She L, Blumenthal JA, O'Connor J. Effects of coping skills training and sertraline in patients with non-cardiac chest pain: a randomized controlled study. *PAIN®*. 2011 Apr 1;152(4):730-41.
- [34] Jonsbu E, Martinsen EW, Morken G, Moum T, Dammen T. Change and impact of illness perceptions among patients with non-cardiac chest pain or benign palpitations following three sessions of CBT. *Behavioural and cognitive psychotherapy*. 2013 Jul;41(4):398-407.
- [35] Beek, M. H. C. T., Oude Voshaar, R. C., Beek, A. M., Zijderveld, G. A., Visser, S., Speckens, A. E. M., & Balkom, A. J. L. M. A brief cognitive behavioural intervention for treating depression and panic disorder in patients with non-cardiac chest pain: a 24 week randomised controlled trial. *Depression and anxiety* . 2013. 30(7), 670-678. <https://doi.org/10.1002/da.22106>
- [36] Lessard MJ, Marchand A, Pelland MÈ, Belleville G, Vadeboncoeur A, Chauny JM, Poitras J, Dupuis G, Fleet R, Foldes-Busque G, Lavoie KL. Comparing two brief psychological interventions to usual care in panic disorder patients presenting to the emergency department with chest pain. *Behavioural and cognitive psychotherapy*. 2012 Mar 1;40(2):129.
- [37] Cooper, K., Gregory, J. D., Walker, I., Lambe, S., & Salkovskis, P. M. Cognitive behaviour therapy for health anxiety: a systematic review and meta-analysis. 2017. *Behavioural and cognitive psychotherapy*, 45(2), 110-123. <https://doi.org/10.1017/S1352465816000527>
- [38] van Gils, A., Schoevers, R. A., Bonvanie, I. J., Gelauff, J. M., Roest, A. M., & Rosmalen, J. G. (2016). Self-help for medically unexplained symptoms: a systematic review and meta-analysis. *Psychosomatic medicine*. 2016 78(6), 728-739. doi: 10.1097/PSY.0000000000000325
- [39] Tyrer, P., Cooper, S., Salkovskis, P., Tyrer, H., Crawford, M., Byford, S., ... & Murphy, D. Clinical and cost-effectiveness of cognitive behaviour therapy for health anxiety in medical patients: a multicentre randomised controlled trial. *The Lancet*. 2014. 383(9913), 219-225. doi: 10.1016/S0140-6736(13)61905-4. Epub 2013 Oct 18.
- [40] McDevitt-Petrovic O, Kirby K, Shevlin M. The prevalence of non-cardiac chest pain (NCCP) using emergency department (ED) data: a Northern Ireland based study. *BMC health services research*. 2017 Dec 1;17(1):549.
- [41] Jonsbu E, Dammen T, Morken G, Moum T, Martinsen EW. Short-term cognitive behavioral therapy for non-cardiac chest pain and benign palpitations: a randomized controlled trial. *Journal of psychosomatic research*. 2011 Feb 1;70(2):117-23.
- [42] Avia MD, Ruiz MA, Olivares ME, Crespo M, Guisado AB, Sánchez A,

Varela A. The meaning of psychological symptoms: effectiveness of a group intervention with hypochondriacal patients. *Behaviour Research and Therapy*. 1996 Jan 1;34(1):23-31.

[43] Potts SG, Lewin R, Fox KA, Johnstone EC. Group psychological treatment for chest pain with normal coronary arteries. *Qjm*. 1999 Feb 1;92(2):81-6.

[44] Beck, A. T. *Cognitive Therapy and the Emotional Disorders*. New York: Penguin. 1976. <https://www.penguin.co.uk/books/151/15136/cognitive-therapy-and-the-emotional-disorders/9780140156898.html>

[45] Escobar JI, Gara MA, Diaz-Martinez AM, Interian A, Warman M, Allen LA, Woolfolk RL, Jahn E, Rodgers D. Effectiveness of a time-limited cognitive behavior therapy-type intervention among primary care patients with medically unexplained symptoms. *The Annals of Family Medicine*. 2007 Jul 1;5(4):328-35.

[46] Martin A, Rauh E, Fichter M, Rief W. A one-session treatment for patients suffering from medically unexplained symptoms in primary care: a randomized clinical trial. *Psychosomatics*. 2007 Jul 1;48(4):294-303.

[47] Arnold, I. A., De Waal, M. W., Eekhof, J. A., Assendelft, W. J., Spinhoven, P., & Van Hemert, A. M. Medically unexplained physical symptoms in primary care: a controlled study on the effectiveness of cognitive-behavioral treatment by the family physician. *Psychosomatics*. 2009 50(5), 515-524. doi: 10.1176/appi.psy.50.5.515.

[48] Speckens AE, van Hemert AM, Bolk JH, Hawton KE, Rooijmans HG. The acceptability of psychological treatment in patients with medically unexplained physical symptoms. *Journal of psychosomatic research*. 1995 Oct 1;39(7):855-63.

[49] Allen LA, Woolfolk RL, Escobar JI, Gara MA, Hamer RM. Cognitive-behavioral therapy for somatization disorder: a randomized controlled trial. *Archives of Internal Medicine*. 2006 Jul 24;166(14):1512-8.

[50] Aiarzaguena JM, Grandes G, Gaminde I, Salazar A, Sanchez A, Arino J. A randomized controlled clinical trial of a psychosocial and communication intervention carried out by GPs for patients with medically unexplained symptoms. *Psychological medicine*. 2007 Feb 1;37(2):283.

[51] Larisch A, Schweickhardt A, Wirsching M, Fritzsche K. Psychosocial interventions for somatizing patients by the general practitioner: a randomized controlled trial. *Journal of psychosomatic research*. 2004 Dec 1;57(6):507-14.

[52] Katsamanis M, Lehrer PM, Escobar JI, Gara MA, Kotay A, Liu R. Psychophysiologic treatment for patients with medically unexplained symptoms: a randomized controlled trial. *Psychosomatics*. 2011 May 1;52(3):218-29.

[53] Wortman MS, Lucassen PL, van Ravesteijn HJ, Bor H, Assendelft PJ, Lucas C, Olde Hartman TC. Brief multimodal psychosomatic therapy in patients with medically unexplained symptoms: feasibility and treatment effects. *Family practice*. 2016 Aug 1;33(4):346-53.

[54] Kashner TM, Rost K, Cohen B, Anderson M, Smith Jr GR. Enhancing the health of somatization disorder patients: Effectiveness of short-term group therapy. *Psychosomatics*. 1995 Sep 1;36(5):462-70.

[55] McManus F, Surawy C, Muse K, Vazquez-Montes M, Williams JM. A randomized clinical trial of mindfulness-based cognitive therapy versus unrestricted services for health anxiety (hypochondriasis). *Journal of*

- consulting and clinical psychology. 2012 Oct;80(5):817.
- [56] McManus F, Muse K, Surawy C. Mindfulness-based Cognitive Therapy (MBCT) For Severe Health Anxiety. *Healthcare, Counselling and Psychotherapy Journal*. 2011:19-23.
- [57] Barsky AJ, Ahern DK. Cognitive behavior therapy for hypochondriasis: a randomized controlled trial. *Jama*. 2004 Mar 24;291(12):1464-70.
- [58] Pelland MÈ, Marchand A, Lessard MJ, Belleville G, Chauny JM, Vadeboncoeur A, Poitras J, Foldes-Busque G, Bacon SL, Lavoie KL. Efficacy of 2 interventions for panic disorder in patients presenting to the ED with chest pain. *The American journal of emergency medicine*. 2011 Nov 1;29(9):1051-61.
- [59] Sanders D, Bass C, Mayou RA, Goodwin S, Bryant BM, Tyndel S. Non-cardiac chest pain: why was a brief intervention apparently ineffective?. *Psychological medicine*. 1997 Sep;27(5): 1033-40.
- [60] Esler, J. L., Barlow, D. H., Woolard, R. H., Nicholson, R. A., Nash, J. M., & Erogul, M. H. A brief cognitive-behavioral intervention for patients with noncardiac chest pain. *Behavior Therapy*. 2003 34(2), 129-148. [https://doi.org/10.1016/S0005-7894\(03\)80009-6](https://doi.org/10.1016/S0005-7894(03)80009-6)
- [61] Mourad G, Strömberg A, Jonsbu E, Gustafsson M, Johansson P, Jaarsma T. Guided Internet-delivered cognitive behavioural therapy in patients with non-cardiac chest pain—a pilot randomized controlled study. *Trials*. 2016 Dec 1;17(1):352.
- [62] Bahremand M, Moradi G, Saeidi M, Mohammadi S, Komasi S. Reducing irrational beliefs and pain severity in patients suffering from non-cardiac chest pain (NCCP): a comparison of relaxation training and metaphor therapy. *The Korean Journal of Pain*. 2015 Apr;28(2):88.
- [63] Bahremand M, Saeidi M, Komasi S. How effective is the use of metaphor therapy on reducing psychological symptoms and pain discomfort in patients with non-cardiac chest pain: a randomized, controlled trial. *Journal of Cardio-Thoracic Medicine*. 2016;4(2):444-9.
- [64] Smith RC, Lyles JS, Gardiner JC, et al: Primary care clinicians treat patients with medically unexplained symptoms: a randomized controlled trial. *J Gen Intern Med* 2006; 21:671-677
- [65] Huibers MJ, Beurskens AJ, Bleijenberg G, et al: The effective-ness of psychosocial interventions delivered by general practitioners. *Cochrane Database Syst Rev* 2003(2):CD003494
- [66] Rief W, Nanke A, Emmerich J, Bender A, Zech T. Causal illness attributions in somatoform disorders: associations with comorbidity and illness behavior. *Journal of psychosomatic research*. 2004 Oct 1;57(4):367-71.
- [67] Machin D, Campbell MJ, Tan SB, Tan SH. Sample sizes for clinical, laboratory and epidemiology studies. John Wiley & Sons; 2018 Aug 20.
- [68] Button KS, Ioannidis JP, Mokrysz C, Nosek BA, Flint J, Robinson ES, Munafò MR. Power failure: why small sample size undermines the reliability of neuroscience. *Nature reviews neuroscience*. 2013 May;14(5):365-76.
- [69] Coster WJ. Making the best match: selecting outcome measures for clinical trials and outcome studies. *American Journal of Occupational Therapy*. 2013 Mar 1;67(2):162-70.
- [70] Gerger H, Hlavica M, Gaab J, Munder T, Barth J. Does it matter who

provides psychological interventions for medically unexplained symptoms? A meta-analysis. *Psychotherapy and Psychosomatics*. 2015;84(4):217-26.

[71] Burton C. Beyond somatisation: a review of the understanding and treatment of medically unexplained physical symptoms (MUPS). *British Journal of General Practice*. 2003 Mar 1;53(488):231-9.

[72] Morriss R, Dowrick C, Salmon P, Peters S, Dunn G, Rogers A, Lewis B, Charles-Jones H, Hogg J, Clifford R, Rigby C. Cluster randomised controlled trial of training practices in reattribution for medically unexplained symptoms. *The British Journal of Psychiatry*. 2007 Dec;191(6):536-42.

[73] Looper KJ, Kirmayer LJ. Behavioral medicine approaches to somatoform disorders. *Journal of consulting and clinical psychology*. 2002 Jun;70(3):810.

[74] Smith, R. C., Lein, C., Collins, C., Lyles, J. S., Given, B., Dwamena, F. C., ... & Given, C. W. Treating patients with medically unexplained symptoms in primary care. *Journal of General Internal Medicine*, 18 2003. (6), 478-489. <https://doi.org/10.1046/j.1525-1497.2003.20815.x>

[75] Williams GC, Halvari H, Niemiec CP, Sørebo Ø, Olafsen AH, Westbye C. Managerial support for basic psychological needs, somatic symptom burden and work-related correlates: A self-determination theory perspective. *Work & Stress*. 2014 Oct 2;28(4):404-19.