Psychological therapists' judgments of pain and treatment decisions: the impact of 'medically unexplained symptoms'.

Dr Brittni Jones, DClinPsy [a] Dr Amanda C de C Williams, PhD [a]

[a] Research Department of Clinical, Educational & Health Psychology, University College London, London, United Kingdom, WC1E 6BT

Corresponding author:

Dr Brittni Jones, DClinPsy

Millfields Personality Disorder Unit, John Howard Centre, London, 12 Kenworthy Road, Homerton, London, United Kingdom, E9 5TD Email: brittni.jones.13@ucl.ac.uk, Phone: +44 20 8510 2003

Declarations of Interest

None.

Abstract

Background: Clinical judgments of pain are influenced by patient and observer factors, and affect their treatment decisions. This study investigated the factors of a lack of a medical explanation for pain, 'medically unexplained' comorbid conditions, and ethnicity, on CBT therapists' judgments of pain and treatment.

Method: An online experimental study was conducted in which participants viewed computer-generated faces expressing pain with a brief written patient history, then estimated the severity and likely exaggeration of pain, and likelihood of pain being caused by a mental or physical health problem. Participants ranked a number of treatment options for priority.

Results: 107 CBT therapists were recruited as participants. Estimates of pain were lower, and of likely exaggeration higher, for patients with pain presented without a medical explanation or with a comorbid 'medically unexplained' condition. They were also more likely to be recommended CBT for depression over referral to a specialist service or psychological treatment for pain. Contrary to expectations, ethnicity produced no effect on pain judgments, only on treatment decisions. Participants' training also affected their treatment decisions.

Conclusions: Lack of medical explanation for pain and other long-term conditions biases assessment and treatment decisions by CBT therapists. As CBT therapists are increasingly referred people with 'medically unexplained' symptoms in primary care, these biases need to be addressed for better treatment.

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Introduction

Nearly 50% of patients in primary care present with at least one symptom for which no adequate medical explanation is found (Haller et al., 2015), often described as 'medically unexplained symptoms' (Creed et al., 2010; Jutel, 2010) although the term is disputed (Williams & Johnson, 2011). The term 'medically unexplained symptoms' originates in psychosomatic theories (Price, 2008), but this overlooks known psychological variance in cause and maintenance of many diseases (Katon et al., 2003). As a result of the problems with the term, various alternative labels have been proposed such as persistent physical symptoms and bodily distress disorder. All of these labels attempt to encompass a range of symptoms and disorders including chronic pain, fibromyalgia, chronic fatigue syndrome, and irritable bowel syndrome. Despite the heterogeneity of symptoms, labels, and theories regarding causal mechanisms, broad labels such as 'medically unexplained symptoms' and psychosomatic theory continue to be relied on by doctors and psychotherapists (Jones, 2019).

Chronic pain commonly occurs without identifiable pathology (Woolf 2010); neural and brain changes underpin amplification of pain and persistence of disability (Melzack & Wall, 1965; Woolf 2010). Studies of chronic pain as a psychosomatic disorder have failed to show that it meets criteria (Crombez et al., 2009). Psychological factors can influence chronic pain for some, but there is no evidence for the traditional theory of somatisation that posits that emotional distress manifests through physical symptoms.

Doctors find these symptoms challenging, particularly in primary care (Chew-Graham et al., 2008). Guidelines (Chitnis, Dowrick, Byng, Turner & Shiers, 2011; Price, 2008) aim to reduce potentially harmful and costly investigations and treatments (Price, 2008; Konnopka et al., 2012), recommending evidence-based psychological therapies such as Cognitive Behaviour Therapy (CBT) but also invoking psychosomatic models (Chitnis et al., 2011; Department of Health, 2014; Naylor, Parsonage, McDaid, Knapp, Fossey & Galea, 2012; Williams & Johnson, 2011). The judgement that pain is 'excessive' for pathology (Department of Health, 2011; Department of Health 2014; Price, 2008, Chitnis et al., 2011),

and the belief that patients exaggerate pain, are common in healthcare (Kappesser et al. 2006), alongside underestimation of pain severity (Seers, Derry, Seers & Moore, 2018; Tait, Chibnall & Kalauokalani, 2009).

Underestimation of pain by health professionals is also found for females compared to males (Schäfer, Prkachin, Kaseweter, Williams, 2016; Tait et al., 2009), and ethnic minority patients (Edwards, Fillingim, & Keefe, 2001; Green et al., 2003; Hirsch, Hollingshead, Ashburn-Nardo & Kroenke, 2015). These judgments underpin reduced analgesia and poorer access to treatment (Anderson et al., 2009; Hausmann et al., 2013, Tait & Chibnall, 2014). Symptoms of patients with multiple complaints (Fitzcharles & Boulos, 2003) or psychosocial problems are more likely to be diagnosed as 'medically unexplained' (Chitness et al., 2011, Department of Health, 2014), despite known under-investigation and under-treatment in people with mental health problems (Druss, Rosenheck, Desai, & Perlin, 2002; Viron & Stern, 2010).

Specialist treatment of pain and chronic fatigue (Deary, Chalder & Sharpe, 2006; Williams et al., 2012) is supplemented by referral of people with 'medically unexplained' symptoms to primary care CBT therapists (Department of Health, 2011; Department of Health, 2014; Rozensky, 2014), despite shortcomings in knowledge and confidence (Lewis, 2013; Rozensky, 2014). The point of referral often marks a switch from medical to psychological models and services, from which many patients disengage (Nettleton, 2006; Sim & Madden, 2008; Stone et al., 2002).

Rationale for current study

Research on judgments of pain severity by mental health practitioners is lacking (Seers, Derry, Seers & Moore, 2018). This study investigated CBT therapists' judgments of chronic pain and treatment decisions in relation to: 1) absence (vs presence) of a medical explanation for pain; 2) presence (vs absence) of a comorbid 'medically unexplained' condition, 3) minority (vs majority) ethnicity. We predicted several interactions to amplify effects on estimation of pain severity and exaggeration, and attribution of mental cause; these factors were absence of medical explanation for pain, presence of a 'medically

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unexplained' condition, and minority ethnicity. We also predicted that these factors would be most evident in those with least training in chronic pain or long-term conditions, as these practitioners are likely to be more reliant on basic guidance and the common oversimplified and incorrect understanding of chronic pain and chronic fatigue syndrome as 'medically unexplained' conditions caused by somatisation.

Method

Setting and participants

Participants were qualified CBT therapists in UK primary care mental health services, recruited by email through service managers, social media, or education providers. Identifying information was removed at source. NHS ethical approval was obtained (ID: 2584/001).

In the UK, most psychological therapy (usually CBT) is provided within the National Health Service (NHS) through 'Improving Access to Psychological Therapies' (IAPT) services. IAPT therapists are specially trained to deliver manualised CBT for people with a range of mental health problems, and recent initiatives have extended this to people with long term health problems and 'medically unexplained symptoms' (Department of Health, 2014). However, the majority of training that therapists will receive will be for treating depression and anxiety. Specialist services for treating people with long term conditions such as chronic pain exist within the NHS as well, but the majority of patients will be referred to IAPT for an initial assessment and treatment or onward referral as appropriate. IAPT services employ 'low intensity' and 'high intensity' CBT therapists, the latter of which have more rigorous training and are accredited practitioners. Only 'high intensity' therapists were used in this study.

Design

This study presented internet-based written vignettes and computer-generated faces, and asked a series of questions, on Qualtrics software (Qualtrics, Provo, UT). After signing consent, participants were randomised automatically to see vignettes of either Southeast Asian or white patients. Asian ethnicity was chosen as the minority group, as these patients

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are often perceived by healthcare providers to be particularly susceptible to 'somatisation', and are therefore more likely to have their pain discounted or undertreated (Grover & Ghosh, 2014). Ethnicity was varied between subjects, and medical explanation within subjects. Each participant viewed three same-ethnicity vignettes, each with one of three categories of medical information about the patient (see online supplementary file):

1) Chronic pain with a common medical explanation and no comorbid conditions ('medically explained pain only').

2) Chronic pain presented as 'medically unexplained' and with no comorbid conditions ('medically unexplained pain only').

3) Chronic pain presented as either medically explained or unexplained, with a comorbid 'medically unexplained' condition, Chronic Fatigue Syndrome ('comorbid CFS with explained/unexplained pain').

A 3 ('medical information': medically explained pain only, medically unexplained pain only, comorbid CFS with explained/unexplained pain) x 2 ('ethnicity': white or Asian) mixed design was used.

Online questions consisted of judgments of the three patients, followed by a survey of the participant's training in chronic pain or 'medically unexplained' or long-term conditions. The first set of dependent variables were participants' judgments of pain for each patient: 1) estimates of pain severity, from 0 = "no pain" to 10 = "worst possible pain"; 2) ratings of pain exaggeration, from 0 = "no exaggeration" to 10 = "strong exaggeration"; 3) ratings of the likelihood that pain was caused by a mental health problem, and 4) ratings of the likelihood that pain was caused by a physical health problem, both from 0 = "very unlikely" to 10 = "very likely". The second set of dependent variables were: participants' priorities for treatment: referral to specialist services for pain, CBT for depression, or psychological treatment protocol for pain.

Vignette design and allocation

Computer-generated faces and written vignettes represented the first meeting with a patient, white or Asian, experiencing chronic pain and low mood, with medically explained or

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unexplained pain, and either comorbid CFS or no comorbid condition. Since women tend to attract adverse judgments more than men, we used only female faces and vignettes.

The two independent variables, medical information and ethnicity, were manipulated through the vignettes or faces. FaceGen software (Singular Inversions, 2014) was used to produce computer-generated patient faces, and FACSGen 2.0 software (Swiss Centre for Affective Sciences, 2010; Roesch et al., 2010) used to manipulate facial expressions. A prototype white face expressing pain was replicated, without altering expression (Roesch et al., 2010), in Asian ethnicity (see supplementary file). Three white and three Asian faces were created.

Written vignettes described a female patient attending for assessment, reporting chronic pain and low mood that developed concurrently. The vignette included either a biomedical explanation ("slipped disc" or "compressed nerve") or implied no medical explanation (scans of the patient's back found "no abnormalities"). It also included either comorbid CFS or no comorbidities. The four vignettes were randomly combined with the six computer-generated faces using Qualtrics software, so that each vignette had an equal chance of being paired with each face.

Each participant was allocated three of 24 possible combinations, all of the same ethnicity, as follows: one vignette of a patient with medically explained pain only, one with medically unexplained pain only, and the third randomly assigned with or without CFS alongside either medically explained or unexplained pain.

Power Analysis

Prior related work (De Ruddere et al., 2012) found a Cohen's d of 0.5 for pain estimations, an F effect size of 0.25. The "G*Power 3.1" program (Erdfelder, Faul, & Buchner, 1996) with $\alpha = 0.05$, desired power = 0.8, and estimated correlation among repeated measures = 0.5, produced a requirement of 20 participants to detect effects for the within-subjects medical information, but up to 76 participants to detect an effect for between-subjects ethnicity.

Analysis

Judgments of pain and the independent variables of medical information and ethnicity were tested using two-way mixed ANOVAs. Judgement scales were treated as interval data (Carifio & Perla, 2007).

A three-way loglinear analysis explored associations between categorical variables: ethnicity, medical information, and participants' treatment decisions. This analysis compared models of the main effects (6 models; Table 4) and interactions of variables (6 models; Table 5) and determined the model that best accounted for variance in the data. Treatment decisions were classified as 1) CBT for depression, 2) referral to specialist pain services, 3) psychological treatment for pain. Data associated with all three categorical variables was organised into combined frequencies for each variable category and all combinations (see Tables 4 and 5). For the simplest model that fit the data, a hierarchical, unsaturated model was chosen using the SPSS loglinear procedure, and backwards stepwise elimination (Laerd Statistics, 2015).

Treatment decisions – participants' level of training

A χ^2 test investigated associations between treatment decisions and level of participants' training in 'medically unexplained' symptoms, chronic pain, or long-term conditions, reduced to three categories: 1) no training, 2) training < 1 day, 3) training > 1 day. Data associated with all categorical variables was organised into combined frequencies for each variable category and every possible combination of these.

Results

Participants

Participant recruitment and attrition rates

107 participants completed the online questions. A further 32 participants did not complete questions fully (N = 21), had no CBT qualification (N = 3), or did not provide consent (N = 8). Most participants were recruited through social media or emails from CBT education providers (N = 91); fewer (N = 48) from nine NHS primary care psychological therapy services.

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The majority of participants were white/white British and described their education as non-medical (see Table 1). Most reported some training in 'medically unexplained' or long-term conditions or chronic pain, half for one day or less, and approximately half with their core CBT training (see supplementary file table 1).

46 participants were randomly assigned to view white patients, and 61 to Asian patients. After the first two vignettes, participants were randomly allocated a third vignette of a patient with comorbid CFS associated with either medically unexplained pain (N = 56) or medically explained pain (N = 51).

The impact of medical explanation on pain judgments

For all variables, homogeneity of variances (Levene's test, p >.05) or covariances (Box's test, p>.05) was met. The numerical scale pain judgments were slightly skewed in a similar direction, but since sample size was reasonable, ANOVAs were run. On the other hand, estimates of the likelihood that pain was caused by a mental or physical health problem were dissimilar in skew (values ranging from -.127 to 1.073 for estimates of pain being caused by a mental health problem and values ranging from-.975 to .986 for estimates of pain being caused by a physical health problem). ANOVAs were still run, but results were interpreted with caution. For all two-way interactions, variables met assumptions of sphericity (Mauchly's test, *p* >.05).

A two-way ANOVA for the impact of medical information on pain judgments showed significant differences between groups, as predicted, for estimations of pain severity and exaggeration, and for estimations of the likelihood that pain was caused by a mental or physical health problem (see Table 2).

The impact of medical explanations on pain judgments (Table 2) showed that medically explained pain was estimated as significantly more severe than medically unexplained pain, with a mean difference of nearly 0.5/10, of medium effect size (*d* = 0.40) (Cohen, 1992). Medically explained pain was estimated to be significantly less likely to be exaggerated than medically unexplained pain, with a mean difference of 0.7/10 (*d* = - 0.38), although ratings of exaggeration overall were low. Medically unexplained pain was also

estimated to be significantly more likely to be caused by a mental health problem and significantly less likely to be caused by a physical health problem than medically explained pain.

Impact of comorbid 'medically unexplained' condition (CFS) on pain judgments

When compared with medically explained pain only, both explained and unexplained pain were estimated to be less severe when accompanied by comorbid CFS (mean difference = -0.65, $p < .001$, d = -0.44), similar to the size of difference produced by a lack of medical explanation. Both explained and unexplained pain were also estimated to be more exaggerated when accompanied by comorbid CFS (mean difference = 0.93, $p < .001$, d = 0.47). Further, explained or unexplained pain accompanied by comorbid CFS was significantly more likely to be attributed to a mental health problem (mean difference = 2.27, $p < .001$, d = 1.03), and significantly less likely to be attributed to a physical health problem (mean difference = -2.11, $p < .001$, d = -1.02); both are large effects (Table 3).

Impact of ethnicity on pain judgments

Mean differences between ethnicities in estimates of pain severity and of exaggeration were in the direction predicted but fell below 0.5/10 and were not statistically significant. Nor was there an interaction between ethnicity and estimates of pain severity or pain exaggeration, or attribution to mental or physical health problem (see supplementary file table 2).

Impact of medical information and ethnicity on treatment decisions

A three-way loglinear analysis for associations between ethnicity, medical information, and participants' treatment decisions produced a model with all main effects and two two-way associations: between ethnicity and treatment priorities, and medical information and treatment priorities. Table 4 shows the main effects of the variables on treatment decisions and table 5 shows the interaction effects of the variables on treatment decisions.

A Pearson test indicated that the model was a good fit to observed data, $\chi^2(6)$ = 0.588, $p > .99$. Overall, most participants (72.6%) prioritised referrals to specialist services or psychological treatment protocols for pain over treatment for depression (see Table 4).

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However, they preferred CBT for depression significantly more for white than for Asian patients (λ = .734, p < .001); 36.2% vs 20.8% (see Table 4 and supplementary Tables 3 and 4). CBT for depression was the least preferred treatment for patients with medically explained pain only (λ = -.844, p = .02), but prioritised for patients with medically unexplained pain only and explained/unexplained pain accompanied by comorbid CFS (33.6% and 31.8% of participants respectively, compared to 16.8% of participants for patients with medically explained pain only (See Table 4). There were no significant interaction effects between variables (see Table 5).

Impact of training on treatment decisions

There was a statistically significant association between training (see table 2) and treatment decisions ($\chi^2(4)$ = 19.47, p < .001), and a moderately strong association between level of training and treatment preferences (φ = 0.174, p < .001). Participants with no training had a strong preference for referring patients to specialist services for pain (Figure 1). Participants with more training were more willing to use treatment models for pain.

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Discussion

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This study investigated the effects of three variables on CBT therapists' judgments of pain and treatment decisions for patients with chronic pain: medical information about pain (medically explained or unexplained pain, presence of a comorbid 'medically unexplained' condition [CFS]), ethnicity (white or Asian), and participants' levels of training in medically unexplained or long-term conditions, or chronic pain.

The impact of a lack of medical explanation for pain on CBT therapists' judgments of pain and treatment decisions

Estimates of pain severity were high across conditions, but consistently higher for patients with medically explained than unexplained pain, albeit by a small difference. Estimates of exaggeration were low overall, but patients with medically unexplained pain were judged to be significantly more likely to exaggerate pain. This is consistent with previous findings of underestimation of pain lacking a medical explanation (De Ruddere et

al., 2014; Tait et al. 2009), despite the lack of scientific basis for referring to tissue damage to estimate pain severity.

Participants in general prioritised pain-specific treatments, but CBT therapists were twice as likely to opt to treat patients with medically unexplained pain for depression. This could be because they were offered a forced choice between psychological treatment protocols for pain (which would typically be CBT or 'third-wave' CBT such as Acceptance and Commitment Therapy or Mindfulness, but this was not specified in the options given to participants) and CBT for depression, and prioritised the option most familiar to them or which fit best with their own service structure or knowledge. Alternatively, they could have preferred treating depression over chronic pain first, possibly due to influence by psychosomatic theories that attribute medically unexplained symptoms to repressed emotions or mental health problems such as depression or anxiety disorders.

The impact of a comorbid medically unexplained condition (CFS) on CBT therapists' judgments of pain and treatment decisions

Patients with CFS and pain, regardless of whether their pain was described as explained or unexplained, were consistently judged to be in less pain and more likely to be exaggerating, although differences were small. Patients with CFS were also significantly more likely to have their pain, medically explained or not, judged to be caused by a mental health problem, a substantial difference of just over 2/10 points.

Consistent with these judgments, CBT therapists were more likely to prefer CBT for depression for patients with CFS, with 31.8% of participants preferring treatment for depression for patients with comorbid CFS, as opposed to 16.8% of participants who preferred treatment for depression for patients with explained pain without comorbid CFS. Thus the same patient referred for chronic pain could have a very different treatment experience, not based on information about pain or mood, but according to whether they have a comorbid diagnosis of CFS and, possibly, the CBT therapist's beliefs about the mechanisms of chronic pain and medically unexplained conditions. Overlapping symptomatology between depression and CFS, such as disturbed sleep, and difficulties

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concentrating, (American Psychiatric Association, 2013) can produce overdiagnosis of depression in CFS. If unaddressed, this could have a negative impact on the treatment offered to patients with CFS.

These findings accord with previous research on the stigmatising beliefs of healthcare providers about patients with medically unexplained symptoms (Stone et al. 2002), and as described by patients with CFS and chronic pain who often feel disbelieved or judged to be fabricating their symptoms by healthcare professionals (Sim & Madden, 2008; Stone et al., 2002).

The impact of ethnicity on CBT therapists' judgments of pain and treatment decisions, and interaction between ethnicity and medical information

Unlike previous research, pain judgments for white and Asian patients showed no significant differences, nor an interaction between ethnicity and medical information. These findings are at odds with a substantial body of research on ethnic disadvantage in healthcare (Anderson et al., 2009; Green et al., 2003; Tait & Chibnall, 2014). The only difference was that treatment for depression was preferred for white (one third) rather than Asian (one fifth) patients. This may indicate less unconscious bias among our sample, from ethnically diverse areas of London, but could be an artefact of the computer-generated faces, or of participants guessing the aims of the study. However, the different allocation of white and Asian patients to CBT indicates some ethnicity-based difference in judgments, perhaps a preference for onward referral (41.5% for Asian patients as opposed to 34.9% for white patients) rather than engaging Asian patients in psychological therapy (psychological therapy for depression preferred by 20.8% of participants for Asian patients, as opposed to 36.2% for white patients). CBT therapists may therefore have unconscious biases that restrict access of Asian people to psychological treatments for mental health problems in primary care.

The impact of CBT therapists' levels of training on treatment decisions

Overall, CBT therapists showed a strong preference for specific pain treatments, associated with level of training. Ninety percent had some training, and the 10% with least training in pain, medically unexplained symptoms, or long-term conditions favoured referral

to specialist pain services; those with more training were more likely to use specific treatment protocols for pain. However, these results are inconsistent with the preference for offering CBT for depression to patients with medically unexplained pain and comorbid CFS. While training may improve treatment decisions, biases remain in conceptualising and treating pain in patients from ethnic minority backgrounds, and in patients with symptoms or conditions labelled as medically unexplained.

Study limitations

Several limitations should be noted. The computer-generated faces may have been weak triggers for ethnic bias, particularly if viewed very briefly, but computer generation allowed equivalence of pain expression that cannot be achieved with actors. On the other hand, in order to make the different vignettes realistic for each participant, differing backgrounds were provided and this could have introduced confounds.

Due to the experimental nature of this study, treatment choices given to participants were limited. There are CBT-based psychological treatment protocols for both chronic pain and chronic fatigue syndrome, but the option for this was only provided for chronic pain and this could have biased results. The choice offered for 'psychological treatment protocols for chronic pain' did not specify CBT specifically, and this could have been confusing for participants. Participants were also not offered the option of CBT for CFS which could have been an option they would have preferred.

Participants' level of training was simply categorised by length, and more detailed information on quality might have provided more interpretable results. As previously detailed, all participant therapists for this study were recruited from IAPT services in the UK. As implied by the name 'Improving Access to Psychological Therapies', IAPT services are intended to provide efficacious psychological therapy (primarily CBT) to the largest number of people with efficiency and rapidity. As such, therapists are trained primarily in treating common mental health conditions such as anxiety and depression, although there is also increased focus on providing CBT for long term health conditions and 'medically unexplained symptoms'. All therapists used for this study were accredited ('high intensity' therapists) to

provide CBT, but the context of the training and the services in which they work could affect the generalisability of our results to other countries.

This study did not examine CBT therapists' understanding of 'medically unexplained symptoms', chronic pain, CFS, or the treatment choices offered to them. CBT therapists within IAPT services are accustomed to offering therapy to large volumes of people and making snap decisions for interventions based on the information, resources, and understanding they have at the time. Thus, the results of this study could be related to these factors rather than unconscious bias. Further research on the impact of these factors on treatment decisions and would be beneficial.

Given the likely correlation of some variables, a multivariate analysis may have been preferable, but the design of the study (in particular the random allocation of a third condition including between and within variation of factors) did not allow analysis other than as planned with mixed ANOVAs.

Finally, recruitment was lower than anticipated from primary care mental health services, and widening to social media and contact from education providers might have reached CBT therapists who were more interested or experienced in treating patients with chronic pain.

Clinical and research implications

Clinical implications

These results suggest that therapists may use presence or absence of a medical explanation for patients' symptoms to evaluate patient needs. Decisions based on these factors have no scientific basis, and confirm patients' fears of being disbelieved and inappropriately treated, in turn leading to failure to engage in interventions. Patients with chronic pain are denied evidence-based treatment that could reduce their disability and healthcare use (Williams et al. 2012), and feel alienated from the healthcare system, and those who express their distress, or who drop out of treatment, confirm clinicians' beliefs that such patients are difficult to treat.

Given the potential implications for patients, training and guidelines need to counter, rather than propagate, inaccurate beliefs about medically unexplained conditions, and about cultural differences in expectations of treatment (Lewis, 2011). But education and training alone may not be enough to address implicit biases (Drwecki, Moore, Ward & Prkachin, 2011); other effective methods (Chapman et al., 2013) include increasing clinicians' awareness of their susceptibility to bias through feedback, or a focus on the individual patient rather than on diagnostic categories. Reference to neuroscientific findings rather than psychosomatic theories to understand mind-body interaction would provide a better basis for understanding chronic pain.

Research implications

This study provides evidence of stigma associated with medically unexplained conditions, consistent with patients' experience, and with negative impact on their wellbeing. Effective methods to counteract it require empirical study, not just recommendations for education. However, guidance for CBT therapists needs to be scrutinised for unhelpful and contradictory advice about treatment of symptoms deemed to be medically unexplained, not least since government initiatives encourage increasing referral of people with long-term conditions to primary care psychological therapy.

Conclusion

This study adds to the body of research on biases in healthcare providers' judgments of pain and treatment decisions, with reference to ethnicity and to symptom explanation. The lack of a conventional medical explanation for pain, or a comorbid disorder labelled as 'medically unexplained', can lead to pain being judged as less serious and possibly exaggerated, and being inappropriately treated. Patient ethnicity did not affect judgments of pain, but did influence CBT therapists' treatment decisions. Recommendations are made for the training and education of CBT providers in order to reduce biases.

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Table 1. Participant characteristics

	n (N = 107)	%
Ethnicity		
White/White British	88	82
Asian/Asian British	7	7
Black/Black British	3	3
Mixed	5	5

Table 2. Means (standard errors), *F* ratios, and *p* values, for the effect of medical information on pain judgments

Questions	Medically explained pain only	Medically unexplained pain only	Comorbid CFS with explained/ unexplained pain	F (2, 210)	p
"How severe do you think [the patient's] pain is?" *0 = no pain, 10 = worst possible pain*	8.3 (1.1)	7.8 (1.4)	7.7 (1.7)	10.02	<.001
"How much do you think [the patient] is exaggerating her pain?" *0 = no exaggeration, 10 = strong exaggeration*	2.0 (1.5)	2.7 (2.2)	2.9 (2.3)	14.41	<.001
"How likely is it that [the patient's] pain is caused by a mental health problem?" *0 = very unlikely, 10 = very likely*	3.6 (2.1)	5.5 (1.9)	5.8 (2.2)	50.96	<.001
"How likely is it that [the patient's] pain is caused by a physical health problem?" *0 = very unlikely, 10 = very likely*	8.7 (1.9)	6.3 (1.7)	6.6 (2.3)	72.12	<.001

Table 3. Pairwise comparisons (mean difference [standard error], p value, and 95% confidence intervals) of the effect of medical information on pain judgments.

|		Mean Difference (standard error)	p	95% Confidence Interval	
				Lower Bound	Upper Bound
"How severe do you think [the patient's] pain is?" 0 = no pain, 10 = worst possible pain					
Comorbid CFS with explained / unexplained pain	Medically unexplained pain only	-.15 (.16)	.34		
Comorbid CFS with explained / unexplained pain	Medically explained pain only	-.648 (.15)	<.001	-.95	-.34
Medically unexplained pain only	Medically explained pain only	-.50 (.14)	<.001	-.78	-.21
"How much do you think [the patient] is exaggerating her pain?" 0 = no exaggeration, 10 = strong exaggeration					
Comorbid CFS with explained / unexplained pain	Medically unexplained pain only	.21 (.19)	.29		
Comorbid CFS with explained / unexplained pain	Medically explained pain only	.93 (.18)	<.001	.57	1.29
Medically unexplained pain only	Medically explained pain only	.73 (.17)	<.001	.38	1.07
"How likely is it that [the patient's] pain is caused by a mental health problem?" 0 = very unlikely, 10 = very likely					
Comorbid CFS with explained / unexplained pain	Medically unexplained pain only	.28 (.25)	.27		
Comorbid CFS with explained / unexplained pain	Medically explained pain only	2.27 (.27)	<.001	1.73	2.81
Medically unexplained pain only	Medically explained pain only	1.99 (.21)	<.001	1.57	2.41
"How likely is it that [the patient's] pain is caused by a physical health problem?" 0 = very unlikely, 10 = very likely					
Comorbid CFS with explained / unexplained pain	Medically unexplained pain only	-.38 (.28)	.17		
Comorbid CFS with explained / unexplained pain	Medically explained pain only	-2.10 (.28)	<.001	-2.65	-1.56
Medically unexplained pain only	Medically explained pain only	-2.49 (.22)	<.001	-2.91	-2.06

Table 4. Total cell frequencies and percentages (of the overall responses in each category) of participants' treatment decisions displayed by ethnicity and medical information

Variable / Combination	Treatment Decision	Frequency	%
Overall	CBT for depression	88	27.4
	Referral to specialist for pain	124	38.6
	Psychological treatment protocol for pain	109	34.0
Ethnicity = white	CBT for depression	50	36.2
	Referral to specialist for pain	48	34.9
	Psychological treatment protocol for pain	40	28.9
Ethnicity = Asian	CBT for depression	38	20.8
	Referral to specialist for pain	76	41.5
	Psychological treatment protocol for pain	69	37.7
Medical information = medically unexplained pain only	CBT for depression	36	33.6
	Referral to specialist for pain	37	34.6
	Psychological treatment protocol for pain	34	31.8
Medical information = medically explained pain only	CBT for depression	18	16.8
	Referral to specialist for pain	48	44.6
	Psychological treatment protocol for pain	41	38.3
Medical information = comorbid CFS with explained/unexplained pain	CBT for depression	34	31.8
	Referral to specialist for pain	39	36.4
	Psychological treatment protocol for pain	34	31.8

Table 5. Cell frequencies and percentages (of overall responses) of participants' treatment decisions displayed by the ethnicity and medical information, and their interactions

Variable / Combination	Treatment Decision	Frequency	%
[ethnicity = white] x [medical Information = medically unexplained pain only]	CBT for depression	21	6.5
	Referral to specialist for pain	13	4.0
	Psychological treatment protocol for pain	12	3.7
[ethnicity = white] x [medical information = medically explained pain only]	CBT for depression	10	3.1
	Referral to specialist for pain	20	6.2
	Psychological treatment protocol for pain	16	5.0
[ethnicity = white] x [medical information = comorbid CFS with explained/unexplained pain]	CBT for depression	19	5.9
	Referral to specialist for pain	15	4.7
	Psychological treatment protocol for pain	12	3.7
[ethnicity = Asian] x [medical Information = medically unexplained pain only]	CBT for depression	15	4.7
	Referral to specialist for pain	24	7.5
	Psychological treatment protocol for pain	22	6.9
[ethnicity = Asian] x [medical Information = medically explained pain only]	CBT for depression	8	2.5
	Referral to specialist for pain	28	8.7
	Psychological treatment protocol for pain	25	7.8
[ethnicity = Asian] x [medical information = comorbid CFS with explained/unexplained pain]	CBT for depression	15	4.7
	Referral to specialist for pain	24	7.5
	Psychological treatment protocol for pain	22	6.9

Figure 1. Percentages of participants in each training category who preferred CBT for depression, specialist referral, or specific treatment protocols for pain

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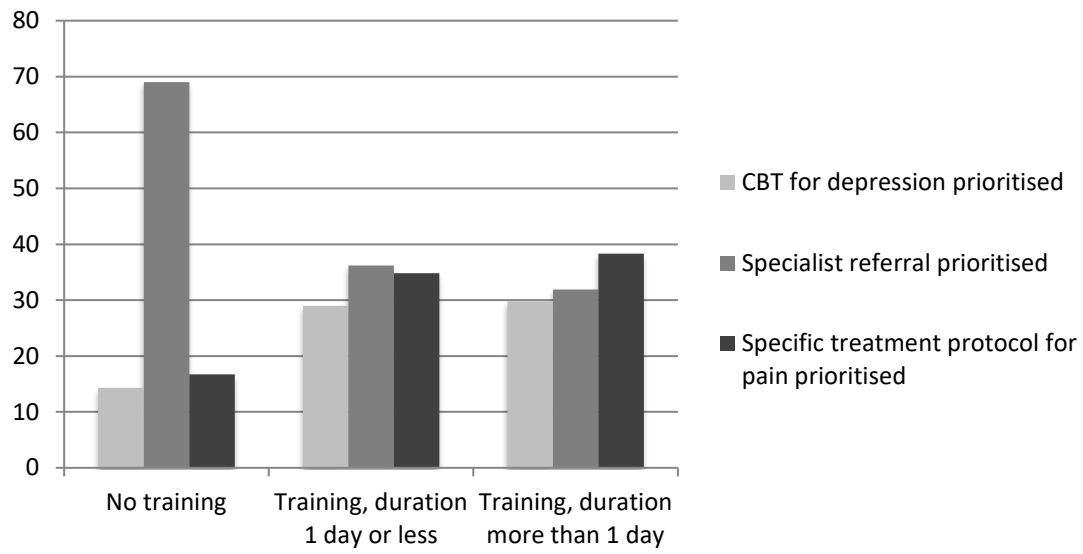
Appendix 1: Computer-generated patient faces and pain expressions
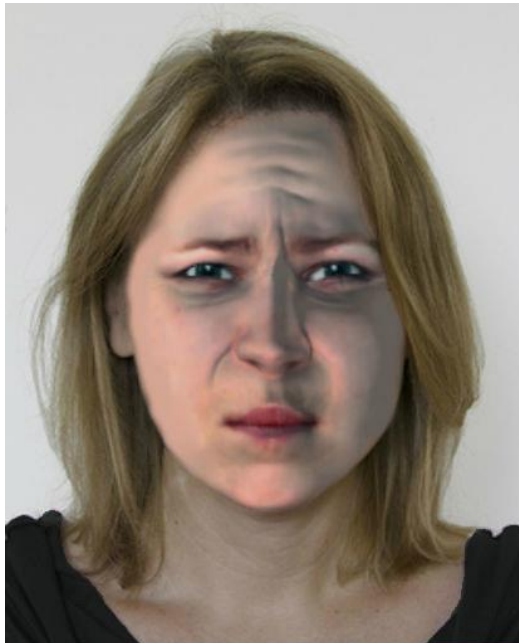
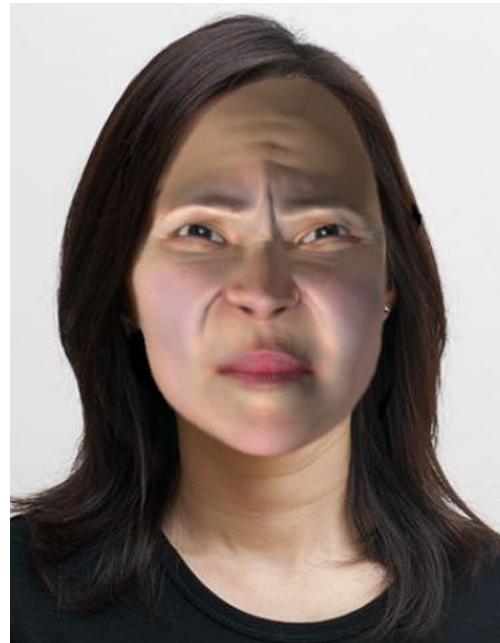White Face 1 – Expression A   Asian Face 1 – Expression A

White Face 2 – Expression B   Asian Face 2 – Expression B

White Face 3 – Expression C   Asian Face 3 – Expression C

Vignette 1: Medically explained pain only

Anna is a 32-year-old woman who was referred to your service by her GP.

The referral states that Anna visited her GP about 8 weeks ago complaining of back pain, and scans showed that she was suffering from a slipped disk in her spine. The GP notes that Anna seems to be depressed (low in mood, tearful, not engaging in enjoyable activities), and requests treatment for this.

In her assessment, Anna reports that her low mood and back pain started a little over a year ago. She tells you that her back is intensely painful, and she feels unable to do the things she enjoys like walking her dog. She also finds it a struggle to do things she needs to do, such as carrying her shopping or washing the dishes. As a result of this, Anna reports that she has been feeling low in mood.

Vignette 2: Medically unexplained pain only

Sarah is a 34-year-old woman who was referred to your service by her GP.

The referral states that Sarah presented 6 weeks ago complaining of chronic back pain, but scans of her spine showed no abnormalities. The GP reports that Sarah seems to be experiencing symptoms of depression (low mood, difficulty sleeping, tearfulness), and he is referring her to your service for assessment and treatment of these difficulties.

In the assessment, Sarah tells you that her low mood and back pain both started about 1 year ago. She describes her back pain as intense and debilitating, and reports that it has made it difficult for her to do things she enjoys, like playing with her son, Thomas (age 7). She also says that she has found it increasingly difficult to engage in exercise and other physical activities. These limitations have left her feeling frustrated and low in mood.

Vignette 3(a): Medically explained pain with comorbid CFS

Emily is a 33-year-old woman who was referred to your service by her GP.

The referral states that Emily visited her GP approximately 9 weeks ago, complaining of fatigue and chronic pain back pain. He explains that she was found to be suffering from a compressed nerve in her spine, and was also diagnosed with Chronic Fatigue Syndrome (CFS). The GP also notes that Emily seems to be depressed (low mood, tearfulness), and requests support for this.

In her assessment, Emily says that her pain, fatigue and low mood started about 1.5 years ago. She tells you that her pain and fatigue have been severe and debilitating, and that she has struggled to do the things she enjoys, such as going out to see friends and family. Emily reports that she finds it difficult to engage in physical activity, and has spent increasing amounts of time at home as a result.

Vignette 3(b): Medically unexplained pain with comorbid CFS

Emily is a 33-year-old woman who was referred to your service by her GP.

The referral states that Emily visited her GP approximately 9 weeks ago, complaining of fatigue and chronic pain back pain. He explains that no abnormalities were found in her scans, but she was diagnosed with Chronic Fatigue Syndrome (CFS). The GP also notes that Emily seems to be depressed (low mood, tearfulness), and requests support for this.

In her assessment, Emily says that her pain, fatigue and low mood started about 1.5 years ago. She tells you that her pain and fatigue have been severe and debilitating, and that she has struggled to do the things she enjoys, such as going out to see friends and family. Emily reports that she finds it difficult to engage in physical activity, and has spent increasing amounts of time at home as a result.

Part 1: Experiment Proper

1.1 Directions

> **For this study, you will be presented with three patient faces and vignettes and will be asked questions on each. Please read each vignette carefully and answer every question.**

1.2 Online questions (note: name of patient changed according to the vignette used)

Please answer the following questions on your opinions of Sarah.

	0 No pain	1	2	3	4	5	6	7	8	9	10 Worst possible pain
How severe do you think Sarah's pain is?	O	O	O	O	O	O	O	O	O	O	O

	0 No exaggeration	1	2	3	4	5	6	7	8	9	10 Strong exaggeration
How much do you think Sarah is exaggerating her pain?	O		O	O	O	O	O	O	O	O	O

	0 No minimisation	1	2	3	4	5	6	7	8	9	10 Strong minimisation
How much do you think Sarah is minimising her pain?	O		O	O	O	O	O	O	O	O	O

	0 Very unlikely	1	2	3	4	5	6	7	8	9	10 Very likely
How likely is it that Sarah's pain is caused by a mental health problem?	O	O	O	O	O	O	O	O	O	O	O

	0 Very unlikely	1	2	3	4	5	6	7	8	9	10 Very likely
How likely is it that Sarah's pain is caused by a physical health problem?	○	○	○	○	○	○	○	○	○	○	○

Treatment Options

Please rank the following treatment options for Sarah in order of most preferred (top) to least preferred (bottom). Please also indicate if you are unfamiliar with a treatment option.

Items

CBT for depression

Specific treatment protocol for chronic pain

Referral to a pain management service

Referral to a specialist Health Psychology service

Contact GP for further information on pain

Most preferred (top) to least preferred (bottom)

Unfamiliar with treatment option

Part 2: Participant information questions

(Note: all options were selectable in the online format)

Please answer the following questions on your ethnic and educational backgrounds.

The following question asks about your ethnic background and gives broad categories for you to respond with. These broad groups are used to ensure that you are not identified by this information.

What is your ethnicity?

White/White British

Black/Black British

Asian/Asian British

Mixed/Multiple Ethnic Groups

Other

Do you consider your educational background before IAPT to be predominantly medical (i.e. nursing) or non-medical?

Medical

Non-medical

Have you received any training in psychological therapy for people with chronic pain, medically unexplained symptoms and/or long-term health conditions?

No training

Training, duration 1 day or less

Training, duration of more than 1 day

Was this training part of your core IAPT training or was it additional (i.e. Continuing Professional Development [CPD])?

Part of core IAPT training

Additional training (i.e. CPD)

Supplementary Files

Table 1. Participant training

	n (N = 107)	%
Background		
Other non-medical	86	80
Nursing	21	20
Amount of training in 'medically unexplained' symptoms or chronic pain		
No training	14	13
1 day or less of training	46	43
More than 1 day of training	47	44
Source of training in 'medically unexplained' symptoms or chronic pain		
Part of core CBT training	31	22
Additional training	53	38
Both	20	14

Table 2. Interactions between medical information and ethnicity on pain estimations

	Medical Information x Ethnicity	
	$F_{(2, 104)}$	*p*
Estimations of pain severity	.969	.383
Estimations of pain exaggeration	.500	.608
Pain caused by mental health problem	.905	.406
Pain caused by physical health problem	2.958	.056
Note: values in bold denote significance (p < .05)		

Table 3. Partial associations, degrees of freedom, and *p* values for the interactions between the variables of ethnicity, medical information and treatment decisions

Variables	Partial Association χ^2	Degrees of Freedom	*p*
Interaction between ethnicity and treatment decisions	**9.782**	**2**	**.008**
Interaction between medical information and treatment decisions	**9.995**	**4**	**.041**

Note: values in bold denote significance (p < .05)

Table 4. Parameter estimates, Z scores and *p* values for the hierarchical model: interaction between ethnicity and treatment decisions, and interaction between medical information and decisions

Parameter	Estimate (standard error)	Z	*p*
Interaction: [ethnicity = white] x [treatment priority = CBT for depression]	**.734 (.283)**	**3.056**	**.002**
Interaction: [medical information = medically explained pain only] x [treatment priority = CBT for depression]	**-.844 (.363)**	**-2.327**	**.020**

Note. Z = Estimate (λ) / Standard Error; values in bold denote significance (p < .05)