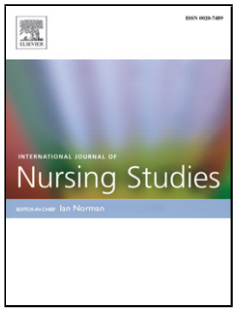

Title: Interventions to Improve mental health nurses' skills, attitudes, and knowledge related to people with a diagnosis of borderline personality disorder: Systematic review

Author: Geoffrey L. Dickens Nutmeg Hallett Emma Lamont

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Interventions to Improve mental health nurses' skills, attitudes, and knowledge related to people with a diagnosis of borderline personality disorder: systematic review

Geoffrey L. Dickens[a]*; Nutmeg Hallett[b]; Emma Lamont[a]

[a] Division of Mental Health Nursing and Counselling
Abertay University
Bell Street
Dundee
DD1 1HG

[b] School of Health Sciences
University of Northampton
Boughton Green Road
Northampton
NN2 7AL

*Corresponding author

Division of Mental Health Nursing and Counselling
Abertay University
Bell Street
Dundee
DD1 1HG
Telephone: +44 7914157365
Email: g.dickens@abertay.ac.uk

Abstract

Objectives: There is some evidence that mental health nurses have poor attitudes towards people with a diagnosis of borderline personality disorder and that this might impact negatively on the development of helpful therapeutic relationships. We aimed to collate the current evidence about interventions that have been devised to improve the responses of mental health nurses toward this group of people.

Design: Systematic review in accordance with the Preferred Reporting Items for Systematic Reviews and Meta Analyses statement.

Data sources: Comprehensive terms were used to search CINAHL, PsycINFO, Medline, Biomedical Reference Collection: Comprehensive, Web of Science, ASSIA, Cochrane Library, EMBASE, ProQuest [including Dissertations/Theses], and Google Scholar for relevant studies.

Review methods: Included studies were those that described an intervention whose aim was to improve attitudes toward, knowledge about or responses to people with a diagnosis of borderline personality disorder. The sample described had to include mental health nurses. Information about study characteristics, intervention content and mode of delivery was extracted. Study quality was assessed, and effect sizes of interventions and potential moderators of those interventions were extracted and converted to Cohen's *d* to aid comparison.

Results: The search strategy yielded a total of eight studies, half of which were judged to be methodologically weak with the remaining four studies judged to be of moderate quality. Only one study employed a control group. The largest effect sizes were found for changes related to cognitive attitudes including knowledge; smaller effect sizes were found in relation to changes in affective outcomes. Self-reported behavioural change in the form of increased use of components of Dialectical Behaviour Therapy following training in this treatment was associated with moderate effect sizes. The largest effect sizes were found among those with poorer baseline attitudes and without previous training about borderline personality disorder.

Conclusions: There is a dearth of high quality evidence about the attitudes of mental health nurses toward people with a diagnosis of borderline personality disorder. This is an important gap since nurses hold the poorest attitudes of professional disciplines involved in the care of this group. Further work is needed to ascertain the most effective elements of training programmes; this should involve trials of interventions in samples that are compared against adequately matched control groups.

Keywords: Borderline personality disorder, attitudes, responses, knowledge, mental health nurses

What is already known

- Mental health practitioners are known to respond to individuals diagnosed with borderline personality disorder in ways which could be disconfirming, stigmatising, or different from other groups of service users

- The mental health nursing profession holds the poorest attitudes of all mental health practitioners towards those diagnosed with a borderline personality disorder
- Training interventions aim to improve attitudes toward, knowledge about or responses to people with a diagnosis of borderline personality disorder

What this study adds

- Identifies all empirical studies about interventions to improve mental health nurses' behavioural or attitudinal responses to, and knowledge about, adults with a borderline personality disorder diagnosis
- Highlights there is a dearth of high quality research into interventions which aim to improve attitudes, knowledge and skills of nurses
- It is a priority to establish an evidence base and ascertain the most effective elements of training programmes

1. Introduction

People diagnosed with borderline personality disorder experience pervasive and persistent instability of affective regulation, self-image, impulse control, behaviour, and interpersonal relationships (Lieb et al., 2004). Up to 6% of adults meet diagnostic criteria during their lifetime, and the condition is associated with substantial psychiatric and physical morbidity (Grant et al., 2008). Management of people diagnosed with borderline personality disorder is resource-intensive; there is a very high rate of self-harm associated with disproportionate use of emergency (Elisei et al., 2012) and inpatient mental health services (Comtois and Carmel, 2014; Hayashi et al., 2010), and impulsive aggression is common (Látalová and Praško, 2010). It has been suggested that this group are unpopular amongst mental health practitioners (Cleary et al., 2002) who respond to them in ways which could be disconfirming (Fraser and Gallop, 1993), stigmatising (Aviram et al., 2006), or that are otherwise qualitatively different, usually negatively so, from the way in which they respond to people with diagnoses of schizophrenia or major depressive disorder (Markham and Trower, 2003). Recent studies (Bodner et al., 2011; Bodner et al., 2015) have concluded that the mental health nursing profession holds the poorest attitudes of all mental health practitioners; further, that this difference cannot be explained by differences in variables such as gender, age, and previous borderline personality disorder-related training. This suggests that it may be something about the nursing profession itself that is associated with poor borderline personality disorder-related attitudes. This question deserves urgent research attention; however, it is also a priority to establish the evidence base in terms of interventions that aim to improve the attitudes towards people with borderline personality disorder, and also the related skills and knowledge. We have therefore conducted a systematic review of the empirical literature to examine mental health nurses' (population) responses to educational or training interventions (intervention/focus of interest) to improve their behaviour or attitudes towards people with a diagnosis of borderline personality disorder (outcomes) compared with any other, or no, intervention (comparators).

2. Method

2.1 Review protocol

The systematic literature review was conducted in accordance with the relevant sections of the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines (Moher et al., 2009).

2.2 Search strategy

The aim of the search was to identify all empirical studies about interventions to improve mental health nurses' behavioural or attitudinal responses to, and knowledge about, adults with a borderline personality disorder diagnosis. The search was undertaken as part of a wider project to identify all studies about mental health nurses' attitudes to people with a diagnosis of borderline personality disorder and not just interventional investigations. Search terms related to the study population, setting and, focus were combined. Multiple computerised databases (CINAHL, PsycINFO, Medline, Biomedical Reference Collection: Comprehensive, Web of Science, ASSIA, Cochrane Library, EMBASE, ProQuest [including Dissertations/Theses], and Google Scholar) were searched. Comprehensive terms, utilising a wild card approach (ending with *) to ensure inclusion of all permutations, were employed (see Appendix for example search). Hand searching of references lists from included studies was conducted to identify further records. Titles and abstracts were reviewed by GLD and the full text version of any paper that described a potentially relevant empirical study was retrieved. Full text papers were reviewed independently by all authors.

2.3 Inclusion/exclusion criteria

The population, intervention, comparator, outcome format was used to guide inclusion and exclusion criteria. The problem of interest was defined as mental health nurses' attitudes towards, knowledge about or responses to people with a diagnosis of borderline personality disorder. Any study that evaluated interventions which aimed to change related outcomes relative to any comparator (including within-subjects) was included. Setting of studies was not limited. Non-English language studies were excluded.

2.4 Study quality

Included studies were assessed against the six criteria contained in the Quality Assessment Tool for Quantitative Studies (Thomas et al., 2004): selection bias, study design, confounders, blinding, data collection methods, and study withdrawals/dropouts; studies were also assigned an overall global rating based on individual quality ratings. Each study was assessed independently by the three authors; agreement between raters was tested using Cohen's kappa statistic and assessed against criteria suggested by Landis and Koch (Landis and Koch, 1977). The quality of potential moderators was assessed using four criteria (Knopp et al., 2013): the validity of tools used to detect moderators; the number of potential moderators tested (measuring fewer variables may enhance the reliability of predictor effects); hypothesis of predictor effects determined a priori (i.e. findings are

confirmatory rather than exploratory); and analysis involving direct testing of the relationship between the predictor and the independent variables.

2.5 Study synthesis

Meta-analysis was not possible due to the range of outcomes measured and tools used. Quantitative data were tabulated according to potential training outcomes (cognitive, affective, behavioural/skills-based, clinical, organisational). Effect sizes were extracted from papers independently by two of the authors (GLD/NH) or, where not included and where sufficient information was presented, were calculated. A range of effect sizes were reported (d, r, B, Π^2_p) and therefore, where possible and in order to facilitate comparison, these were converted into Cohen's *d* using online software (David B. Wilson, 2000) and interpreted in line with Cohen's (1977) guidance such that .2 indicated a small effect size, .5 a medium effect size and .8 a large effect size.

3. Results

3.1 Study characteristics

The search strategy yielded nine unique studies (see Figure 1; Table 1) which were conducted in a range of inpatient and community mental health services in six countries, and published between 1996 and 2015. In total *N*= 1,197 people were recruited into the studies (median *n*=69 range 15 to 418); *n*=420 (36.3%) study participants were nurses (median 56.3% range 6% to 100%).

3.2 Study methodology

Most studies employed within-subjects, before- after or longitudinal cohort designs. Two studies (Miller and Davenport, 1996; Stringer et al., 2015a) included a control group of nurses who received no intervention; however, allocation to control or study group was not randomised in either. One study described as a randomised controlled trial (Commons Treloar and Lewis, 2008) did not involve randomisation nor was there a control group.

3.3 Study interventions

Most studies (*n*=8; 88.9%) described training interventions that were delivered in a face-to-face educational/training session(s) (see Table 1); one (Miller and Davenport, 1996) was delivered in the form of a self-paced workbook while another (Herschell et al., 2014) used individual telephone consultation alongside formal education and training. The median amount of time spent in training in face-to-face interventions was 10.5-hours (range 1.5 to 74). Briefer interventions took the format of a single lecture or workshop, while longer and more intensive interventions were conducted in

blocks of one or more days across a period of time. The content of training included (see Table 2) information about epidemiology, diagnosis and aetiology; explanation of Dialectical Behaviour Therapy and its related skills, processes and strategies including mindfulness techniques; delivery of the complete intensive Dialectical Behaviour Therapy training (Landes and Linehan, 2012); delivery of the complete Systems Training for Emotional Predictability and Problem Solving for outpatients with borderline personality programme to practitioners for them to use for psycho-educational purposes with patients (Blum et al., 2008); delivery of a collaborative care program approach to care for people with borderline personality disorder (Stringer *et al*., 2015a); a live-service user perspective about borderline personality disorder; education about recovery-focused ways of working with people with

Figure 1: Flow diagram of literature search modified from the PRISMA flow diagram (Moher *et al.* 2009)

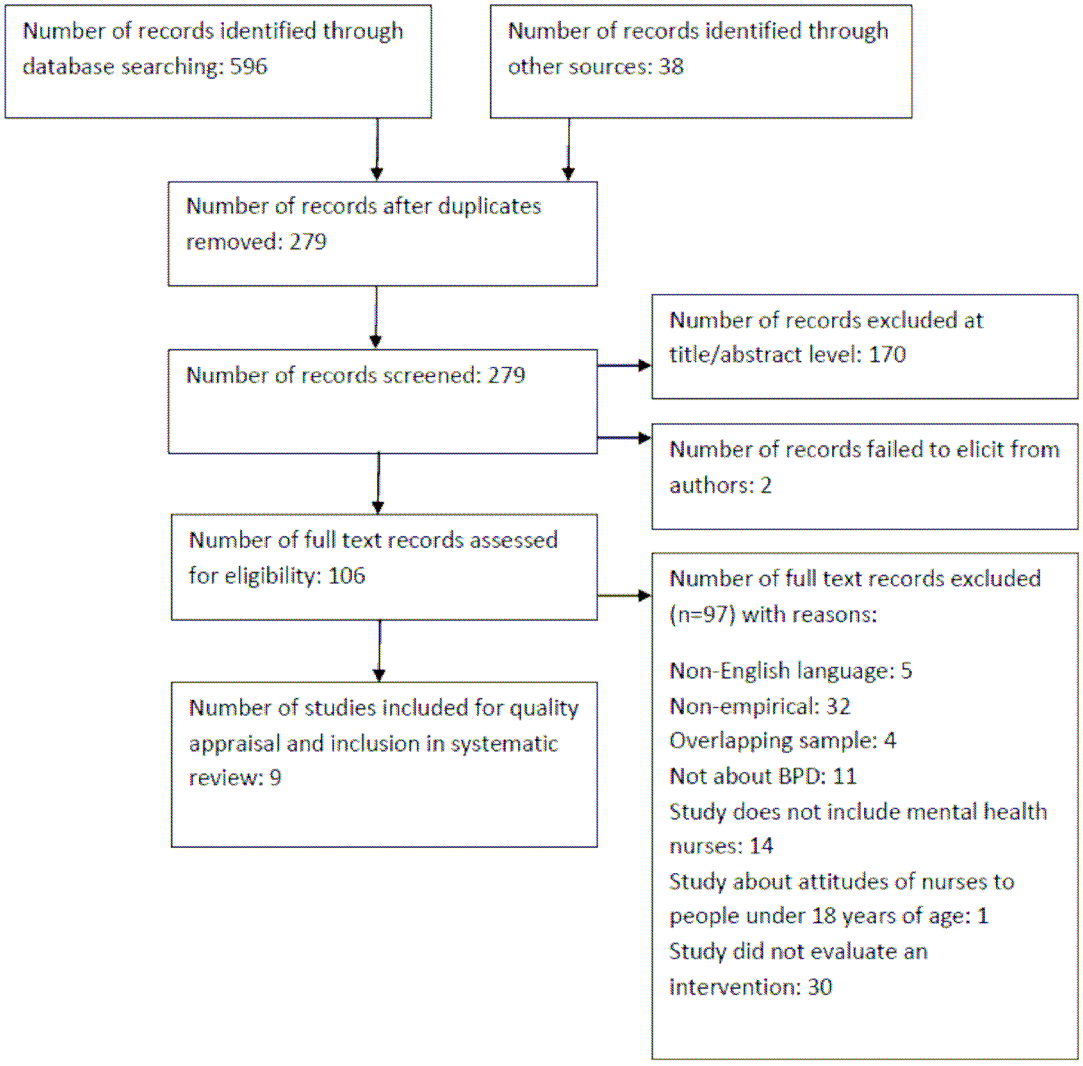

Table 1: Included study details

Study	Sample	Country	Setting	Length/Intensity of intervention	Mode of delivery	Design and follow up
Clark *et al.* (2015)	*N*=34 MDT staff (*n*=23 nurses).	UK	23-bed low secure mental health unit for borderline personality disorder-diagnosed women.	90-minutes	Lecture presentation "The science of borderline personality disorder". Delivered by clinical psychologist.	Longitudinal cohort design. Pre- and post- session and 6-months follow up
Commons Treloar and Lewis (2008)	*N*=99 registered practitioners (*n*=75 nurses) who encounter patients with borderline personality disorder in their work.	Australia & New Zealand	Emergency medicine and mental health services of three hospitals.	90-minute lecture. 30-minute discussion seminar, provision of clinical and relevant national guidelines.	Lecture/discussion	AB cohort design. Prior to and immediately after the session
Hazelton *et al.* (2006)	T1: *N*=69 staff (67% registered psychiatric nurses), T2: *N*=38 (72% nurses); T3: *N*=24 (42% nurses) plus focus groups with *N*=24 at T1 and *N*=18 at T2.	Australia	Mental health service comprising inpatient, community, liaison and rehabilitation teams	2-day basic training, 2-day advanced training	Training workshops, interactive exercises and experiential activities	Longitudinal cohort design. Baseline 1-month and 6-months
Herschell *et al.* (2014)	*N*=68 (*n*=9 13% registered nurses) (*n*=35 by 22-month follow up)	US	Community mental health centres	2 x 5 day clinical training sessions, 1 x 2-day clinical training session and extensive telephone consultation. Time in training 32-96 of 96 available hours Mean 74 hours. Phone consultation -110 hours mean 25.7 hours.	Dialectical Behaviour Therapy (DBT) implementation process over 18-months using recommended training method including workshops with lectures, group and individual activities, and telephone consultation	Longitudinal cohort design. At 4 time periods (once at baseline) over 22 months
Knaak *et al.* (2015)	*N*=191 clinicians (*n*=27 nurses)	Canada	Inpatient, community and outreach service providers attending a training event	3-hour workshop on borderline personality disorder and DBT to 230 people	Lecture	AB cohort design. Prior to and immediately after the session
Krawitz (2004)	*N*=418 (46% nurses) mental health clinicians	Australia	Public mental health and substance abuse service workers at a training workshop.	2-day workshop	Workshop	Longitudinal cohort design. Pre- and post workshop 6-month follow up
Miller and Davenport (1996)	*N*=32 registered nurses	US	Four acute psychiatric units in general hospitals	Self-paced programmed instruction	Module in the form of a 31-page booklet titled "*Success With Patients Who Have Borderline Personality Disorder"*	Controlled trial. Pre-test/control and four weeks later
Shanks *et al.* (2011)	*N*=271 clinicians (<6% nurses) experienced in diagnosing/treating borderline personality disorder.	US	Workshop for clinicians	6-hour training workshop	Workshop	AB cohort design. Prior to and immediately after the session
Stringer *et al.* (2015a)	*N*=14 registered psychiatric nurses	Netherlands	Workshop for clinicians Two Community Mental Health teams	3-day training in a collaborative care program for people with borderline personality disorder (either diagnosed or score of 15 or higher on Borderline Personality Disorder Severity Index (Arntz *et al.*, 2003)	Integrated components in preparation, treatment, and evaluation stages	Controlled trial. Data collected at baseline, 5-months and 9-months

Table 2: Intervention content

Study	Epidemiology	Diagnosis/ symptoms	Aetiology	Emphasis on biological underpininnings	Staff attitudes/ reactions	Self-harm and suicide facts	Therapeutic responses	Case studies presented	National treatment guidelines described	DBT[1] theory and skills	Mindfulness practice	Role play	Skills modelling	Diary cards/ homework	Telephone consultation	Personal service user testimony	Personal recovery focus	Person not disorder focus	Importance of language	Monitoring/ modifying reactions	Staff communication/ consistency	Taught to run STEPPS [2] programme	Taught CCP[3] approach
Clark *et al.* (2014)	+	+	+	+																			
Commons Treloar and Lewis (2008)	+	+	+		+	+	+	+	+														
Hazelton *et al.* (2006)	+	+	+							+	+	+		+									
Herschell *et al.* (2014)										+			+		+								
Knaak *et al.* (2015)		+	+		+		+						+			+	+	+		+	+		
Krawitz (2004)	+	+	+										+						+				
Miller and Davenport (1996)		+	+		+		+													+	+		
Shanks *et al.* (2011)		+	+				+															+	
Stringer *et al.* (2015a)																							+

[1] Dialectical Behaviour Therapy; [2]Systems Training for Emotional Predictability and Problem Solving (Blum et al., 2008); 3 Collaborative Care Programme approach (Stringer *et al.*, 2011)

borderline personality disorder; the use of appropriate person-centred rather than disorder-focused language; information about staff reactions to people with borderline personality disorder from previous research; and the importance for practitioners of monitoring and modifying their own reactions to people with borderline personality disorder in order to build therapeutic rapport.

3.4 Study outcomes

Intended study outcomes fell under one of two headings. First, a number of studies aimed to make improvements to attitudes, knowledge and behaviour through skills training usually in the form of a structured, recognised program such as the Dialectical Behaviour Therapy intensive training model (Landes and Linehan, 2012), Systems Training for Emotional Predictability and Problem Solving for outpatients with borderline personality (Blum et al., 2008). Second, a number of studies aimed to change attitudes directly through education to ensure accurate understanding of borderline personality disorder as a legitimate psychiatric disorder whose symptoms include some of the undesirable behaviours that may be perceived by practitioners to be within the patients' control. No study aimed to measure clinical or organisational outcomes resulting from interventions, and only two aimed to examine the effect on behaviour, albeit through self-report. Stringer et al., (2011a) trained nursing staff in a collaborative care programme approach whose aim was to improve patient outcomes and not explicitly to improve nurses' attitudes. However, as part of the study attitudinal measures were taken and results presented.

3.5 Study quality

Agreement between raters on study quality was substantial to almost perfect (k=0.63-0.92) (Landis and Koch, 1977). Five of the nine studies were judged to be of moderate quality overall while the remainder were judged weak (see Table 3). No study described any process of blinding either for participants or researchers. A number of studies used measurement tools with inadequate evidence of internal reliability or test-retest/ inter-rater reliability (see Table 4). None of the analyses of potential moderators were judged to meet all four quality criteria.

3.6 Study findings

Evaluations of interventions reported improvement, usually with small to medium effect sizes (see Table 5), across a range of cognitive outcomes including knowledge (Clark et al., 2015; Miller and Davenport, 1996; Hazelton et al., 2006 (Shanks et al., 2011), beliefs about aetiology (Clark et al., 2015), attitudes towards deliberate self-harm (Commons Treloar and Lewis, 2008), beliefs about the effectiveness of Dialectical Behaviour Therapy (Herschell et al., 2014). Affective improvements have included perspective taking (Clark et al., 2015), attitudes (Herschell et al., 2014; Knaak et al., 2015;

Krawitz, 2004), willingness to disclose, and desire for social distance (Knaak et al., 2015; Shanks et al., 2011). Affective outcomes were most usually associated with small effect sizes. Behavioural outcomes included increased self-perception of use of components of Dialectical Behaviour Therapy (Herschell et al., 2014), and improved self-reported clinical skills (Krawitz, 2004). Analysis of potential moderators suggested that those with the least previous borderline personality disorder-specific training, those with the poorest pre-intervention attitudes, and medics benefitted most from training interventions (Clark et al., 2015; Herschell et al., 2014; Commons Treloar and Lewis, 2008). The finding that self-reported use of components of Dialectical Behaviour Therapy increased significantly, and that use of this approach was positively correlated with improvement in attitudes towards borderline personality disorder, suggests a reciprocally sustainable relationship (Herschell et al., 2014). Of the less intensive interventions, the largest effect sizes were revealed in Miller and Davenport's (1996) controlled workbook-based study and, in particular, those related to neurobiological borderline personality disorder-related knowledge in Clark et al's (2015) study. Finally, while Stringer et al.,(2011a) found some evidence of improved patient outcomes among patients who had been assigned to nurses trained in a collaborative care programme approach, there was no discernible change in attitudes in those nurses, and none in a control group of nurses delivering care as usual.

Table 3: Study quality assessment

Study	Selection bias	Study design	Confounders	Blinding	Data collection methods	Withdrawals and dropouts	Global rating
Clark et al (2014)	Moderate	Moderate	Moderate	Weak	Moderate	Strong	Moderate
Commons Treloar and Lewis (2008)	Weak	Moderate	Moderate	Weak	Moderate	Strong	Weak
Hazelton et al (2006)	Moderate	Weak	Weak	Weak	Weak	Weak	Weak
Herschell et al (2014)	Strong	Moderate	Moderate	Weak	Moderate	Strong	Moderate
Knaak et al (2015)	Moderate	Moderate	Moderate	Weak	Moderate	Strong	Moderate
Krawitz (2004)	Moderate	Moderate	Moderate	Weak	Weak	Moderate	Weak
Miller and Davenport (2006)	Moderate	Strong	Moderate	Weak	Moderate	Strong	Moderate
Shanks et al (2011)	Moderate	Moderate	Moderate	Weak	Weak	Strong	Weak
Stringer et al (2015a)	Moderate	Moderate	Moderate	Weak	Moderate	Strong	Moderate

Table 4: Measurement tools used and psychometric properties

Study	Scale used	Outcomes measured	IR	V	R
Clark et al (2014)	Mental Health Locus of Origin Scale (Hill and Bale, 1980; Clark et al., 2015)	Aetiological beliefs about mental disorder (borderline personality disorder in this amended version by Clark et al., 2015) including endogenous beliefs (genetic and physiological factors) and interactional beliefs (psychosocial factors). 20 item-statements	-	-	-[a]
	Interpersonal Reactivity Index (IRI) (Davis, 1980; Clark et al., 2015). Amended for hospital setting .	Empathy. (1) 7-item Empathic Concern subscale (wording amended to reflect hospital setting Clark et al., 2015). 7-items about emotional responses to the negative experiences of others, and feelings of warmth and compassion for others; (2) 7-item Perspective Taking subscale (wording also amended for hospital setting). 7-items about spontaneous attempts to adopt the perspective of others and see things from their point of view	+ +	+ +	+ +[b]
	Ad hoc knowledge about borderline personality disorder questionnaire (Clark et al., 2015)	Knowledge about borderline personality disorder. 10-item multiple choice questions about genetics, function of pre-frontal cortex and amygdala, serotonin, developmental factors, emotional reactions to facial expressions, and the emotional experience of borderline personality disorder patients.	-	-	-
Commons Treloar and Lewis (2008)	Attitudes Towards Deliberate Self Harm Questionnaire (ADSHQ) (McAllister et al., 2002)	Attitudes towards deliberate self harm (DSH). Four factors: (1) Perceived confidence in assessment and referral of DSH patients; (2) Ability to deal effectively with DSH patients; (3) Use of an empathetic approach; (4) Hospital regulations that guide practice. 33 item-statements	+[c]	Fa, Co	-
Hazelton et al (2006)	Purpose designed borderline personality disorder clinician questionnaire (Cleary et al., 2002)	Demographics, borderline personality disorder-related experience and training, knowledge (test and self-perceived), confidence, current service provision, training needs, role of mental health staff, commitment to further education. -	-	-	-
Herschell et al (2014)	Attitude scale (Herschell et al., 2014)	Confidence in the effectiveness of DBT (''What is the likelihood that appropriate use of DBT for treating borderline personality disorder will be effective in achieving each of the following goals for your clients?'' for each of 15 outcomes e.g., reducing suicide attempts); use of DBT components (''To what extent do you use the following types of services and treatment components for consumers with borderline personality disorder?" for each of nine components e.g., treatment targets); and attitudes toward consumers with borderline personality disorder (6-item statements of positive/negative attributes about borderline personality disorder e.g., "Treating consumers with borderline personality disorder can be rewarding")	+[d]	Fa	-
Knaak et al (2015)	Opening Minds Scale for Healthcare Providers (OMS-HC) (Kassam et al., 2012; Modgill et al., 2014)	Attitudes and behavioural intentions towards mental illness and persons with a mental illness. 15 item, 3-factors: Negative attitudes; willingness to disclose/seek help; preference for social distance	+	+	+
	Opening Minds Scale for Healthcare Providers (OMS-HC) amended version (Kassam et al., 2012; Modgill et al., 2014; Knaak et al., 2015)	Attitudes and behavioural intentions towards borderline personality disorder and persons with a borderline personality disorder diagnosis. As above but item-statement replace 'mental illness' with 'borderline personality disorder'	-	Fa	-
Krawitz (2004)	Survey questionnaire (Krawitz, 2004)	Willingness, optimism, enthusiasm, confidence, theoretical knowledge and clinical skills related to working with borderline personality disorder patients. 6-item scale	-	-	-
Miller and Davenport (2006)	Reece's Questionnaire on Borderline Personality Disorder (unpublished)	Knowledge about, behavioural intentions and attitudes towards people with Borderline Personality Disorder. 48 item-statements	+	Fa, Co	-
Shanks et al (2011)	Clinician attitudes questionnaire (Shanks et al., 2011)	Past 12-month attitudes to patients with borderline personality disorder. 9-item tool	-	-	-
Stringer et al (2015a)	Scale to Assess Therapeutic Relationships in Community Mental Health Care Clinician version (STAR-C; Guire-Snieckus et al., 2007)	Quality of the therapeutic relationship (clinician version). 12 item statements, 3-factors: positive collaboration, emotional difficulties, and positive clinician factor	+	+	+
	Suicidal Behaviour Attitude Scale (SBAS; Botega et al., 2005)	Attitudes towards suicide. 21-item scale, 3-factors: feelings towards the patient, professional capacity, right to suicide	+	Fa, Co	-
	Attitudes Towards Deliberate Self Harm Questionnaire (ADSHQ) (McAllister et al., 2002)	Attitudes towards deliberate self harm (DSH). Four factors: (1) Perceived confidence in assessment and referral of DSH patients; (2) Ability to deal effectively with DSH patients; (3) Use of an empathetic approach; (4) Hospital regulations that guide practice. 33 item-statements	+	Fa. Co	-

Key: Fa= Face validity; Co = Content validity

[a] Paper reports that validity has been reported in another paper, but validity not addressed in the cited paper.; [b] Validity and reliability for original non-amended scale. Factor structure also reported in cited paper.

[c] Face/ content validity reported in (McAllister et al., 2002). IRR reported in (McAllister et al., 2002; Commons Treloar and Lewis, 2008); [d] 'Borderline' internal reliability reported for attitudes subscale
[e] Poor internal reliability for behavioural subscale and not included in and thus not included in subsequent analysis

4. Discussion

We have systematically identified and appraised the extant world evidence about interventions to improve mental health nurses' responses to people with a diagnosis of borderline personality disorder. While the subject has provoked considerable interest, the absolute volume of evidence is small, somewhat in contrast to the amount of opinion, and much of it is of doubtful value. There is a total absence of evidence about any broader clinical or organisational outcomes that might be expected or desirable either from changing nurses' attitudes or raising their skill-levels in managing this group of patients. The only evidence that such interventions actually change practice comes from two self-report studies, one of which was judged to be of weak design (Krawitz, 2004) and, in any event, found statistically significant but clinically negligible effects. The other (Herschell et al., 2014) reported improvements that were sustained for up to 2-years following intensive Dialectical Behaviour Therapy training, and the study used outcomes measurement tools that met some criteria for psychometric properties; as a result this represents the current best evidence for interventions. However, a relatively small proportion of the sample were mental health nurses, and there was a high drop-out rate between survey iterations which should lead us to question whether training like this is feasible and deliverable in routine practice. Further, none of the moderator analyses in the study met quality criteria and these findings should therefore be treated with some caution. The study found, perhaps unsurprisingly, that intensive training in Dialectical Behaviour Therapy skills increased participants perceived use of those skills; there were also some attitudinal changes although effect sizes were small which was disappointing for such a relatively intensive course of study. A pilot study evaluating, as a secondary aim, the effects of a collaborative care programme approach (Stringer et al., 2011a) on nurses' attitudes used some of the most robust outcome measures but detected no change in attitudes of nurses receiving the training intervention nor controls who did not receive it.

In other studies, improvements were found but study effect sizes were usually modest; though there was a strong indication that those with the most negative baseline attitudes improved considerably over the course of a 22-month study relative to those with less poor attitudes at outset (Herschell et al., 2014). Similarly, those with least baseline confidence in the effectiveness of Dialectical Behaviour Therapy improved a great deal on this aspect relative to those with more baseline confidence; and those who least used Dialectical Behaviour Therapy skills at baseline were considerably more likely to improve on this than colleagues who were already implementing these aspects. This does suggest that any training might best be targeted at those with little prior knowledge.

Table 5: Effect sizes of affective, behavioural and cognitive outcomes and moderators

Study	Outcome	Effect size (*d*)	Interpretation
Clark et al 2014	Cognitive:		
	Knowledge pre-test – post-test	1.09	Large effect (improvement)
	Knowledge post-test – follow up	.28	Small effect
	Knowledge pre-test – follow up	1.04	Large effect
	Mental Health Locus of Origin pre-test – post-test	.68	Medium effect
	Mental Health Locus of Origin post-test – follow up	.02	No effect
	Mental Health Locus of Origin pre-test – follow up	.52	Medium effect
	Affective:		
	Interpersonal Reactivity Index Perspective Taking Subscale Pre-test- Post-test	-	n/a
	Interpersonal Reactivity Index Perspective Taking Subscale Post-test- follow up	.65	Medium effect
	Interpersonal Reactivity Index Perspective Taking Subscale Pre-test- follow up	-	n/a
	Interpersonal Reactivity Index Empathic Concern subscale Pre-test- Post-test	-	n/a
	Interpersonal Reactivity Index Empathic Concern subscale Post-test- follow up	-	n/a
	Interpersonal Reactivity Index Empathic Concern subscale Pre-test- follow up	-	n/a
	Moderators:		
	Previous borderline personality disorder training vs. no borderline personality disorder training post-test - follow up		
	Interpersonal Reactivity Index Perspective Taking Subscale	-.87	Large effect (improvement) for those with no previous training relative to those with
	Professional registration vs. unqualified staff		
	No difference on any measure	-	n/a
	2+ years experience vs. <2 years		
	No difference on any measure	-	n/a
Commons Treloar and Lewis (2008)	Cognitive:		
	Attitudes towards Deliberate Self-Harm Questionnaire (ADSQ) total	.40	Small effect
	ADSQ Confidence in assessment and referral subscale	.43	Small effect
	ADSQ Dealing effectively with borderline personality disorder patients subscale	.30	Small effect
	ADSQ Empathic approach subscale	.10	No effect
	ADSQ Knowledge of hospital regulations subscale	.12	No effect
	Moderators:[a]		
	Emergency medicine / mental health clinicians	.43/ .42	Small effect/ Small effect
	Males/ females	.16/ .43	No effect/ small effect
	In-house training/ undergraduate training/postgraduate training	.18/ .46/ .44	No effect/Small effect/ Small effect
	0-6 years experience/ 6-10 years/ 11-15 years/ 16+ years	.37/ .65/ .45/ .21	Small effect/ Medium effect/ Small effect/ Small effect
	Prior borderline personality disorder training/ No prior training	.43/ .39	Small effect/ Small effect
	Daily/ Weekly/ Bi-weekly/ Monthly contact with borderline personality disorder patients	.49/ .35/ .36/ .40	Small effect/ Small effect/ Small effect/ Small effect
	Improvements for Nursing staff/ Allied Health staff/ Medical staff	.39/ .41/ .79	Small effect/ Small effect/ Medium effect
Hazelton et al (2006)	No inferential statistics presented	-	n/a
Herschell et al (2014)	Affective:		
	Attitudes towards borderline personality disorder	.43	Small effect
	Cognitive:		
	Beliefs about effectiveness of DBT for borderline personality disorder	.33	Small effect
	Behavioural:		
	Perceived use of DBT components	.70	Medium effect
	Moderators:		
	Baseline attitudes	1.91	Those with poorest attitudes improve most (large effect)

	Educational level		
	Confidence about effectiveness of DBT	.33	Confidence in the effectiveness of borderline personality disorder improved most in those with lower educational levels (Small effect)
	Baseline confidence in DBT	-1.04	Those with least confidence in DBT at baseline make most improvements in confidence in DBT (Large effect)
	Baseline perceived use of DBT components	.61	Those using DBT components least at baseline increased their use the most (Medium effect)
Knaak et al (2015)	Affective:		
	Negative attitudes to borderline personality disorder e.g., I am more comfortable helping a person who has a physical illness than I am helping a person who has a mental illness. [b]	.29	Small effect
	Willingness to disclose If I had a mental illness, I would tell my friends. [b]	.19	No effect
	Desire for social distance e.g., If a colleague with whom I worked told me they had a managed mental illness, I would be just as willing to work with him/her. [b]	.26	Small effect
Krawitz (2004)	Affective:		
	Willingness to work with people with borderline personality disorder	.09	No effect
	Optimism about treatment for people with borderline personality disorder	.15	No effect
	Enthusiasm about working with people with borderline personality disorder	.13	No effect
	Confidence about working with people with borderline personality disorder	.23	Small effect
	Cognitive:		
	Theoretical knowledge about borderline personality disorder	.06	No effect
	Behavioural:		
	Clinical skills self-report	.04	No effect
Miller and Davenport (1996)	Cognitive:		
	Knowledge	.54	Medium effect
	Attitude	.56	Medium effect
	Behavioural intentions [c]	-	-
Shanks et al (2011)	Affective:		
	"If I had a choice, I would prefer to avoid caring for a borderline personality disorder patient"	.35	Small effect
	"I feel professionally competent to care for borderline personality disorder patients"	.36	Small effect
	"I dislike borderline personality disorder patients"	.23	Small effect
	"I feel I can make a positive difference in the lives of borderline personality disorder patients"	.18	No effect
	"I would like more training in the management and treatment of borderline personality disorder patients"	.57	Medium effect
	Cognitive:		
	"I believe the borderline personality disorder patient has low self-esteem"	.09	No effect
	"The prognosis for borderline personality disorder treatment is hopeless"	.42	Small effect
	"Some psychotherapies are very effective in helping patients with borderline personality disorder"	.20	Small effect
	"borderline personality disorder is an illness that causes symptoms that are distressing to the borderline personality disorder individual"	.26	Small effect
Stringer et al (2015a)	Cognitive:		
	Quality of therapeutic relation Scale to Assess Therapeutic Relationships in Community Mental Health Care Clinician version (STAR-C; Guire-Snieckus et al., 2007)	-	n/a
	Suicidal Behaviour Attitude Scale (SBAS; Botega et al., 2005)	-	n/a
	Attitudes towards Deliberate Self-Harm Questionnaire (ADSQ) total	-	n/a

[a] All moderators calculated on ADSQ total [b] Term Borderline Personality Disorder replace 'mental illness' in one study arm [c] Outcome not reported since scale failed to demonstrate internal consistency

There is therefore a need to further establish whether investment in training programmes to improve mental health nurses' attitudes towards people diagnosed with borderline personality disorder is justified in terms of improvements in attitudes. More fundamentally, there is a need at a very basic level to establish whether such improvements then translate into improved practice and then in clinically significant outcomes such as improved therapeutic relationships, service user satisfaction, or reductions in self-harming behaviour. Further, there is a need to establish what the most potent elements of training might be, particularly the relative roles of taught theoretical knowledge which aims to correct misconceptions about borderline personality disorder and of interventions that aim to improve empathic concern for people with borderline personality disorder. The inclusion in Knaak et al's (2015) training of personal testimony from a person with a diagnosis of borderline personality disorder should surely be a feature of any new interventions, although it will be important to manage this such that involvement is meaningful and not tokenistic.

Findings from the current study show that the most recent evidence is the strongest with four of the five studies rated as being of moderate quality having been published since 2014 (Clark et al., 2015; Herschell et al., 2014; Knaak et al., 2015; Stringer et al., 2015a). Still, only one of these have included a suitable control group, and the quality for four studies is therefore moderate for a before-after design but does not amount to a convincing evidence base per se. The study by Stringer et al., (2011a) which employed a control group of only six nurses was possibly under-powered to detect all but the very largest changes. There are no high quality randomised controlled or controlled trials of interventions to improve borderline personality disorder-related attitudes or knowledge. The only other study of moderate quality (Miller and Davenport, 1996), and the only other to include an adequate control group, was conducted two decades ago and is overdue for replication and extension. In total, studies of at least moderate quality suggest that changes in borderline personality disorder-related knowledge and beliefs about the biological underpinnings can be made and sustained (Clark et al., 2015). Similarly, attitudes to borderline personality disorder were sustained in Herschell et al's (2014) study of Dialectical Behaviour Therapy implementation, although the measurement tool used to establish this was of doubtful value. Unsurprisingly, the largest effect sizes from implementation of Dialectical Behaviour Therapy in this study were in terms of perceived use of those components. Knaak et al's (2015) study also lends support to the hypothesis that a one-off training session can change attitudes, and a singular strength of the study was its relatively robust outcome measures; however, it is not clear whether these changes were sustained or whether they translated in to changed practice. Clark et al's (2014) finding that perspective taking, a

form of empathy, improved between post- intervention and follow-up, but not between pre- and post- intervention, suggests that gains in affective responses to people with borderline personality disorder may be less immediate than knowledge-based cognitive responses. This means that future studies should always aim to follow up participants to ascertain whether gains have been sustained.

A further interesting finding from Clark et al's (2014) study was in relation to the beliefs about aetiology; analysis suggested a medium and sustained effect such that participants expressed more strong beliefs about the neurobiological underpinnings of borderline personality disorder following the educational intervention. This was presented by the authors as a positive outcome; however, the authors of the outcome tool used (Mental Health Location of Origin scale; Hill and Bale, 1980) have expressed that clinicians' adherence to an aetiology consistent with endogenous, biological factors rather than interactional, environmental factors might, paradoxically, "engender passive behaviours and attitudes contrary to the goals towards which they would have their clients aspire" (p. 156). The value of diagnostic labelling in mental health is a contested area: evidence suggests that promoting understanding of mental disorder as a disease reduces blame for mental illness; however, it may exacerbate problematic beliefs about dangerousness. Concurrently, minimising the genetic or biological bases of disorders may be construed as wilfully ignoring the evidence (Corrigan and Watson, 2004). In this instance, at least, improved knowledge about the neurobiological basis of borderline personality disorder has been accompanied by a longer term improvement in perspective taking. Further research is required to determine whether there is a causal link between changing beliefs about the origin of borderline personality disorder and improving empathy measures like perspective taking.

While recent studies appear to have shown that mental health nurses have poorer attitudes than their professional colleagues (Bodner et al., 2015a; Bodner et al., 2011) the current review has not been able to establish whether they respond differentially to training interventions. This may be in part due to methodological quality since our review suggests that moderator analyses have been of insufficient quality to address this question. Bodner et al., (2015) suggest that the relatively poor performance of mental health nurses on borderline personality disorder-related attitudinal measures could be due to aspects of their role given that potential covariates such as gender, age, and experience were controlled for in their analyses. The authors' suggestion is that the nursing profession, relative to others, is characterised by a lack of ability to self-control their exposure to

patients who they find difficult to manage. Other professionals may be able to better regulate their face-to-face contact time, giving them time to reflect and to use the content of any training provided to help them empathise with individuals with borderline personality disorder. Nurses, especially those employed in inpatient settings, may – in addition to dealing with patients when at their most disturbed – have to deal with scenarios on a daily basis with little chance of respite. This line of argument is supported by findings of a qualitative analysis (Stringer et al., 2011b) of the implementation of one of the studies included in the current review (Stringer et al, 2011a) in which it was reported that the impeding factors to successful implementation of the study intervention included limited autonomy and self-management. Additional factors that were reported to impede programme implementation in Stringer et al.,'s (2011a) study included issues around mental health nurses being unaccustomed to working according to protocol, poor agenda setting, reluctance to address serious problems, limited attendance at supervision, and insufficient multidisciplinary support (Stringer et al., 2011b). All of these issues will require addressing as part of any successful programme to improve attitudes.

Given the totality of evidence about interventions to improve nurses' responses, and the potential structural factors underlying their lack of efficacy, it is questionable whether educational interventions. per se, are likely to have any meaningful and sustained impact on practice. Rather, more success might be expected from organisational interventions that build flexibility into how nurses' work to allow them to retain some control of their contact time. If this is the case then it may be that interventions aimed at cognitive or affective adjustment are simply inadequate in the face of this apparent structural inequality, and that organisational adjustments best help attitudinal adjustment at an individual level.

4.1 Limitations

The current review has a number of limitations. Most notably, there have been few studies on this topic and we have therefore had to include studies of dubious methodological rigour. We only included English language studies which may limit the number of available studies. We were unable to synthesise study effect sizes due to the range of outcomes reported and tools used to determine them. Finally, we excluded a number of relevant papers which studied attitudes to personality disorder in general; while this may have increased the amount of available evidence we believe it would have diluted the focused nature of our current review.

4.2 Summary and conclusions

There is insufficient evidence of high quality to strongly support development and implementation of training programmes to improve mental health nurses' responses to people diagnosed with borderline personality disorder. Research of improved methodological rigour is urgently required to ascertain whether interventions can lead directly to improved attitudes and indirectly to improved patient outcomes.

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* study included in the systematic review

Appendix 1: Example search

Search term		Results
1)	Borderline personality disorder	1,532
2)	Emotionally unstable personality disorder	9
3)	1 OR 2	1,539
4)	Nurs*	687,188
5)	Mental	134,375
6)	Psychiatr*	71,497
7)	5 OR 6	173,877
8)	4 AND 7	33,804
9)	Attitud*	202,493
10)	Perce*	188,454
11)	Belie*	49,040
12)	Knowledg*	116,229
13)	Stereotyp*	6,625
14)	Stigma*	11,814
15)	Opinion*	22,035
16)	View*	63,090
17)	Disposition*	3,464
18)	Reaction	51,803
19)	Stand*	250,853
20)	Feel*	27,950
21)	Impression*	5,144
22)	Judg*	18,128
23)	Characteri*	151,731
24)	Experien*	213,903
25)	9,10,11,12,13,14,15,16,17,18,19,20,21,22, OR 23	994,800
26)	3 AND 8 AND 24	82

Limits: English language only, studies about attitudes towards adults only

Figure 1: Flow diagram of literature search modified from PRISMA (Moher *et al.*, 2002)