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Psychosocial interventions for internalised stigma in people with a schizophrenia-spectrum diagnosis: a systematic narrative synthesis and meta-analysis

Abstract

It is acknowledged that people with a schizophrenia-spectrum diagnosis experience higher levels of stigma compared to any other mental health diagnosis. As a consequence, their experience of internalised stigma is likely to be the most detrimental and pervasive. Internalised stigma interventions have shown some benefits in those who experience serious mental illness including those diagnosed with a schizophrenia-spectrum diagnosis. A systematic narrative review and meta-analysis were conducted examining the efficacy of internalised stigma interventions for people with a schizophrenia-spectrum diagnosis. Randomised Controlled Trials, controlled trials, and cohort studies were included and assessed against quality criteria. The search identified 12 studies; 7 randomised controlled trials, 3 cohort studies and 2 controlled trials. A variety of psychosocial interventions were utilised with the majority employing Cognitive Behaviour Therapy (CBT), psychoeducation and social skills training. The core outcomes used to examine the efficacy of the intervention were internalised stigma, self-esteem, empowerment, and functioning. The meta-analysis revealed an improvement in internalised stigma favouring the internalised stigma intervention but was not significant (5 RCTs, n=200). Self-efficacy and insight were significantly improved favouring the internalised stigma intervention. Internalised stigma interventions show promise in those with schizophrenia-spectrum diagnoses. Existing interventions have demonstrated small effects and employed small samples. Large scale RCTs are required to further develop the evidence base of more targeted interventions.

Introduction

Stigma was originally defined as an "attribute that is deeply discrediting" which turns a person from "a whole and usual person to a tainted, discounted one", page 3(Goffman, 1963). Stigma is pervasive amongst people diagnosed with a mental health difficulty in our current society (Wood et al., 2014). Corrigan and Watson (2002) explained that stigma comprises two distinct components; public stigma and self-stigma. Public stigma consists of negative stereotypes (a specific negative belief about a group), prejudice (agreement with belief) and discrimination (negative behavioural response) from the public towards the stigmatised group. Self-stigma, often described as internalised stigma interchangeably, is becoming aware of the negative stereotypes, agreeing with it and applying it to one's self (Corrigan et al., 2010). The term internalised stigma will be used henceforth throughout this review. Internalised stigma can be extremely detrimental to service users who experience severe mental illness (SMI). Livingston and Boyd (2010) conducted a systematic review of the consequences of internalised stigma and found that it was associated with poorer self-esteem, hopelessness, reduced self-efficacy and disempowerment. It can also exacerbate existing mental health problems, increase social avoidance and impair recovery(Corrigan and Watson, 2002).

Arguably, those with a schizophrenia-spectrum diagnosis experience higher levels of internalised stigma compared to other SMI diagnoses (Holzinger et al., 2003). A number of large-scale studies have identified that those diagnosed with schizophrenia are viewed most negatively by the public (Wood et al, 2014), experienced the most discrimination (Dinos et al., 2004), and experience the most rejection (Lundberg et al., 2008). High levels of internalised stigma were reported by almost of half (41.7%) of a large European sample of people with a schizophrenia-spectrum diagnosis and two thirds (69.4%) reported moderate or high perceived discrimination (Brohan et al., 2010a). Moreover, compared to bipolar disorder, people diagnosed with schizophrenia reported significantly higher rates of internalised stigma with significant impacts on their social life and overall functioning (Karidi et al., 2015; Sarisoy et al., 2013). Furthermore, in a large sample (n=261), internalised stigma was identified as conceptually different in schizophrenia compared to depression and bipolar disorders (Oliveria et al., 2015). Internalised stigma in schizophrenia was characterised by dissatisfaction with social relationships, high levels of stereotyping, withdrawal and alienation (Oliveria et al., 2015). Furthermore, they found that internalised stigma was a risk factor for social isolation only in individuals with schizophrenia, which may worsen the course of the disorder.

There is an increasing interest in the development of interventions to reduce internalised stigma. A number of pilot studies and small scale trials have been conducted examining the efficacy of these

interventions. These studies have found some promising finding such as significant improvements in engulfment, hopelessness, quality of life, self-esteem and personal recovery (Fung et al., 2011; McCay et al., 2007; Morrison et al., 2015). However, a number of these studies have reported no impact on their primary outcome measures of internalised stigma and other secondary outcomes (Fung et al., 2011; Link et al., 2002; Morrison et al., 2015; Yanos et al., 2012) .

A handful of systematic reviews have been conducted examining the efficacy of internalised stigma interventions for SMI. Although the evidence base is relatively small, examination of studies which meet rigorous criteria for inclusion in a systematic review and meta-analysis allows conclusions to be drawn regarding the efficacy of such interventions (Moher et al., 2009). Griffiths et al. (2014) conducted a systematic review of three randomised controlled trials (RCTs) of internalised stigma interventions for SMI (Fung et al., 2011; Luoma et al., 2012; Yanos et al., 2012) but their pooled mean effect sizes were not statistically significant. Two further systematic reviews conducted by Mittal et al. (2014) and Yanos et al. (2014) examined internalised stigma interventions for SMI using a narrative synthesis methodology. Mittal et al. (2014) reported that only two of seven studies examining participants with a diagnosis of schizophrenia-spectrum diagnosis reported significant improvements post intervention. Yanos et al (2014) examined internalised stigma interventions in detail and considered their effective change mechanisms. They concluded that psychoeducation and cognitive challenging were the most important elements of an intervention. Both reviews did not follow rigorous criteria for the conduct of systematic reviews and meta-analysis as outlined by, for example, the Cochrane Collaboration (Higgins and Green, 2011).

The use of meta-analysis with small, potentially heterogeneous studies is a topic of much debate. The systematic review and meta-analysis of small studies has been illustrated to increase methodological heterogeneity, error rates, and the chances of identifying a false statistically significant finding (Borenstein et al., 2009; IntHoult et al., 2015; IntHout et al., 2012) However, in an area with a limited evidence base, the meta-analysis of small studies can provide informative effect sizes as long as sensitivity analyses is considered (Borenstein et al., 2009; IntHoult et al., 2015). To date, no systematic reviews have been conducted examining the efficacy of internalised stigma interventions for people with a schizophrenia-spectrum diagnosis. It is important that such interventions are examined within a systematic review in order to determine whether they are efficacious in this population. There has been no examination of study quality and risk of bias of internalised stigma intervention studies. Furthermore, a narrative exploration of change mechanism would offer important information on what may bring about change in internalised stigma interventions. There also appears to be no agreement on outcome measures used to assess the

efficacy of an internalised stigma intervention. Finally, data from internalised stigma RCTs have not been subject to a meta-analysis to examine for overall efficacy. Given the limited literature, a systematic narrative review (Colliver et al., 2008) and meta-analysis will be conducted. The review will aim to examine study quality and risk of bias of included trials, compare and contrast internalised stigma interventions for their key mechanisms of change, and scrutinise study outcomes and measures used to assess outcome. The meta-analysis will aim to examine the efficacy of the internalised stigma interventions on the primary outcome of internalised stigma, and other secondary outcomes.

Methodology

Study protocol

The review protocol was published online at the PROSPERO website on the 25th November 2014 (http://www.crd.york.ac.uk/PROSPERO/display_record.asp?ID=CRD42014015161#.VLflgNEfzIU).

Inclusion and exclusion Criteria

This review included studies (a) where ≥50% of participants meet criteria for (i) a schizophrenia-spectrum diagnoses (schizophrenia, schizophreniform disorder, schizoaffective disorder, delusional disorder, psychotic disorder not otherwise specified defined by any criteria) or (ii) threshold for Early Intervention in Psychosis services (to allow for diagnostic uncertainty), in order to ensure the sample was primarily those with a schizophrenia spectrum diagnosis or psychosis presentation (b) which examined internalised stigma or self-stigma as an outcome (c) which examined a psychosocial intervention which aimed to reduce internalised stigma (d) in English language, (e) with a sample of adults aged 16–65 (f) with a randomised control trial (RCT), controlled trial (CT) or cohort study (CS) (an observational study which follows participants over time) (CS) (g) of effectiveness and efficacy. Exclusion criteria were defined by (a) studies which include ≥50% of participants with psychosis as a secondary diagnosis (e.g. to alcohol use, learning disability) (b) observational studies. No criteria are specified in regard to severity and/or duration of illness.

Search strategy

Three electronic databases, Embase, Medline and PsycInfo were utilised for the search. Two trial registries were also examined, the Cochrane Central Register of Controlled Trials (CENTRAL) and the Clinical Trials registry, to identify any unpublished or soon to be published studies in peer review journals. The initial search was conducted between November 2014 and March 2015 by the first author (LW) using the following key words: (Schizo* OR psychosis OR psychotic OR Delusion* OR Voices OR Hallucinat* OR Mental Illness) AND (Stigma) AND (Intervention OR Therapy OR CBT OR Trial). Initially titles and abstracts were screened. For relevant studies full texts were sourced. Authors of conference abstracts were followed-up. All corresponding authors of the final studies included were contacted to identify any further published or unpublished work. References of included studies were also examined for any further papers. Recent reviews examining internalised stigma for SMI, Livingston and Boyd (2010), Mittal et al(2014), Yanos et al(2014) and Griffiths et al(2014) were also examined for relevant studies.

Data extraction

Individual study data was extracted by the first author (LW) into pre-defined tables with uncertainties discussed with AM and RB. RB crosschecked 25% of data extraction and no errors were identified. A number of study characteristics were extracted, including type of intervention, intervention modality (group or individual therapy), duration of treatment, number of prescribed sessions, duration of treatment period (weeks), control condition (e.g. treatment as usual), number of arms of study, demographics (age, gender, diagnosis), consent rates, dropout rates, percentage of participants who had the full amount of sessions, length of sessions, and pertinent statistical information (means, standard deviation, N from each assessment time point (e.g. baseline, post therapy, follow-up points) on specific outcomes of interest. Analysis of any available relapse, rehospitalisation and adverse events was also extracted. If any data were not available in the published report, corresponding authors were contacted. The above data were obtainable from the majority of studies. Two studies (Link et al., 2002; McCay et al., 2007) were unable to provide usable data for meta-analysis, but these reports still contributed to the narrative synthesis of the review.

Methodological quality and risk of bias of included studies

A detailed examination of the quality of the studies was undertaken using the Effective Public Health Practice Project (EPHPP) tool (Armiji-Olivo et al., 2012). This tool was chosen over the GRADE risk of bias tool (Higgins et al., 2011), which was outlined in our submitted proposal, as it allowed assessment of quantitative studies with a variety of methodologies. It examined six key areas of potential bias; selection bias, study design, confounders, blinding, data collection methods, and withdrawals and dropouts (see measure for more detail). Studies can score weak, moderate or strong with weak scores illustrating high risk of bias and strong scores reflecting a low risk of bias. Quality assessments were carried out by the first author (LW) and were reviewed with other authors in supervision (AM, RB). Risk of bias assessments are outlined in table 2.

Data Analysis

The inclusion of non-RCTs meant data analysis was informed by the procedures of narrative synthesis (Popay et al., 2006). Narrative synthesis offered a framework for structuring a systematic review which includes non-RCT studies. It outlined four key elements to the process; developing a theory of how the intervention works, why and for whom, developing a preliminary synthesis of findings of included studies, exploring relationships in the data, and assessing the robustness of the synthesis. Initially, the review compared and contrasted the types of therapies employed within the included studies. Individual study outcome measures were examined and described. A vote

counting tool, as recommended by Popay et al. (2006), was implemented to visually illustrate when a study reported a positive effect, a negative effect or did not report for a given outcome.

Meta-analysis was used to integrate available effects extracted from the RCTs included in the review. Meta-analysis was conducted using Comprehensive Meta-Analysis (CMA) software, version 3(Borenstein et al., 2009). As all available data was continuous, data from different outcome measures were combined using the standardised mean difference, Hedges g (Higgins and Green, 2011). Effect sizes were calculated using post therapy and follow-up data provided in the included studies, based on means, standard deviations and sample sizes extracted from the primary studies. A meta-analysis was conducted where at least two RCTs contributed to the examined outcome. Fung et al. (2011) was the only study with multiple follow-up points (two, four, six months) so, in order to be conservative, the middle follow-up point (four months) was extracted. Where there was more than one measure for an examined outcome with a study, and aggregated effect was estimated based on the procedure outlined by Borenstein et al.(Borenstein et al., 2009). Effects were integrated using a random effects model.

Results

Systematic narrative review

Study selection

The process of study selection followed study extraction guidance from Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA)(Moher et al., 2009), as outlined in figure 1. The initial search, after removing duplicates, identified 3176 papers and conference abstracts. The majority of studies were excluded through title and abstract screening for being irrelevant, leaving 20 studies. The full-texts for these studies were sourced and examined against the inclusion and exclusion criteria. This led to a total ten of studies being identified from the database searches. Two further studies were identified from, (a) the reference list of an already included study (Link et al., 2002) and (b) another identified by a contacted author(Roe et al., 2014). A final twelve studies were included in the review. Excluded studies are identified in appendix 1.

Study characteristics

Study characteristics and baseline demographics are outlined in table 1. A total of seven studies used a RCT design (Fung et al., 2011; Link et al., 2002; McCay et al., 2007; Morrison et al., 2015; Rusch et al., 2014; Russinova et al., 2014; Yanos et al., 2012) and five were CTs or CSs(Knight et al., 2006; Lucksted et al., 2011; Roe et al., 2014; Sousa et al., 2012; Uchino et al., 2012). All studies were relatively small with the biggest sample including sixty six participants. Only four studies included participants exclusively with a schizophrenia-spectrum diagnosis. In terms of these participants, ten studies examined those with SMI, one included a combination of SMI and early onset presentations, and one examined first episode psychosis only. The majority of participants were male and middle aged. All studies were conducted in outpatient settings.

Risk of bias

All studies were assessed for bias using the EPHPP tool. Summary scores and ratings are outlined in table 2. All studies were assessed on six key areas outlined by the EPHPP tool; *selection bias, study design, confounders, blinding, data collection, withdrawals and dropouts* (Armiji-Olivo et al., 2012). Selection bias was examined and only one study rated strongly in this category as they sampled participants from a variety of services (Morrison et al., in press), whereas all other studies were either not randomised and/or recruited participants from one or two clinics, and therefore scored moderately. All RCTs were rated as strongly on study design because investigators would have no way of predicting the allocation of participants to groups thus minimising bias. The CTs were rated

moderate as they had a control group; however participants were not randomly allocated. All other studies which did not have a control group were rated as weak. The RCTs also scored strongly on confounders, except Link et al. (2002) as confounders were not described. All other studies scored weakly on this variable as confounders were not controlled for in the design or data analysis. Only two RCTs explicitly described blinding procedures, either in their published paper or through further contact with the author, whereas all the other papers did not comment on blinding procedures. All other studies were unblinded so were scored weakly. All studies scored strongly on data collection methods as they all employed widely used outcome measures which have been validated with people who experience SMI. All RCTs, except Yanos et al(2012) and Link et al(2002), rated strongly on drop outs. One CTs rated as weak on this factor with over 50% of drop outs (Roe et al., 2014), the rest of the studies rated moderately. Overall, the global ratings of bias expectedly found the RCTs as strong and all other studies as weak.

Characteristics of self-stigma interventions used

The average number of sessions offered by the RCTs was 12.71 sessions (range 3 – 20), and 11.4 (range 6-20) by other studies. The majority of studies included in this review utilised a group format intervention (91.67%) and one study offered individual therapy (Morrison et al., 2015). The majority of studies (66.67%) used some form of psychoeducation and/or CBT. Two studies explicitly identified their therapeutic intervention as Cognitive Behaviour Therapy (CBT) as the basis of their intervention (Knight et al., 2006; Morrison et al., 2015). Knight et al. (2006) drew upon two main cognitive models for their CBT intervention; group treatment for auditory hallucinations (Wykes et al., 1999) and, 'I am super' group treatment for self-esteem (Lecomte et al., 1999). Morrison et al's (2015) 12 session intervention was underpinned by the CBT for psychosis theoretical model (Morrison, 2001) and used techniques from Morrison et al's (2008) self-help manual.

Two studies delivered an adapted CBT approach titled Narrative Enhancement Cognitive Therapy (NECT) for their group intervention(Roe et al., 2014; Yanos et al., 2012). NECT is a 20 session manualised intervention based on principles of CBT but aims to help participants gain a positive narrative about their mental health experiences through story telling with their peers (Roe et al., 2014). It consisted of four modules, an introduction, psychoeducation, cognitive restructuring, and narrative enhancement.

Two studies combined psychoeducation, CBT and social skills training to develop their respective 16 session group interventions (Fung et al., 2011; Lucksted et al., 2011). Fung et al. (2011) developed a therapeutic framework consisting of psychoeducation about schizophrenia, CBT for irrational ideas

of self-concept and abilities, motivational intervention to promote change and social skills training. Lucksted (2011) used CBT skill to challenge self-stigmatising thinking, strengthening positive aspects of self, creating a belongingness to their local community, family and friends, and responding to overt experiences of stigma and discrimination.

Two studies developed peer-led group interventions (Rusch et al., 2014; Russinova et al., 2014) which were 3 and 10 sessions in length respectively. Coming Out Proud (COP) (Rusch et al., 2014) is a 3 two hour session manualised group programme to support people with a diagnosis of mental illness in their decisions around disclosing their diagnosis to others. The sessions examined advantages and disadvantages of disclosure, different ways to disclose and how to disclose their personal mental health journey in an idiosyncratic way. The photovoice intervention (Russinova et al., 2014) aimed to help participants develop a personal narrative regarding stigma and discrimination, and means for recovery through the use of photography. Throughout the group process, participants developed coping strategies for managing stigma, such as challenging stigma in social situations and challenging internalised stigma through strategies similar to cognitive restructuring.

The remaining studies used: six session group psychoeducation to teach participants accurate non-stigmatising perceptions of schizophrenia with an emphasis on violence and criminal activity (Uchino et al., 2012); 16 session group psychoeducation focusing on developing awareness of stigma, recognising the possibility of internalising stigma and identifying stigma in social interactions and learning how to cope (Link et al., 2002); 15 session group sociodrama, where participants discuss their experiences and understanding of stigma and act out related scenes, alongside online educational classes about stigma (Sousa et al., 2012); and a 12 session recovery focused group which helped participants develop a healthy self-concept through acceptable appraisals of psychosis, minimising self-stigmatising attitudes, developing hope and future goals (McCay et al., 2007).

Characteristics of outcomes used

Each study was examined for the outcomes utilised to measure the efficacy of their interventions. As this a relatively novel area, there is no agreement regarding the types of outcome measures to reliably assess the efficacy of an internalised stigma intervention apart from internalised stigma itself. The outcome measures used by each study are outlined in table 3. The primary outcome of internalised stigma was measured using a diverse number of self-report questionnaires across studies which arguably conceptualise internalised stigma differently. The Internalised Stigma of Mental Illness (ISMI) scale (Ritsher et al., 2003) and the Chinese self-stigma scale (Fung et al., 2007)

are the only measures designed specifically to examine internalised stigma. Other measures used such as the perceived discrimination and devaluation (PDD) scale(Link et al., 2002) and the modified engulfment scale(McCay and Seeman, 1998) are arguably not measuring the same construct of stigma. In a systematic review of outcome measures, Brohan et al. (2010b) distinguished between perceived stigma (how individuals think the public perceive people with mental health difficulties, and they view them personally) and internalised stigma (internalisation of cognitions and emotions in response to public stigma) and explain how they are conceptually different. Therefore, the PDD scale may be measuring aspects of both perceived and internalised stigma. Furthermore, (Brohan et al., 2010b) found that the PDD scale only met one (construct validity) of five reliability and validity criteria. The primary measure, ISMI(Ritsher et al., 2003) used within most of the studies met four (content validity, internal consistency, construct validity, test-retest reliability) of their five outlined criteria (not floor/ceiling effects). Brohan et al(2010b) identified that there are no acceptable measures of internalised stigma currently available. In addition, these measures have been validated in SMI and not specifically with those who have a schizophrenia-spectrum diagnosis which may experience internalised stigma differently. Therefore, the reliability and validity of the internalised stigma measures is questionable.

There was little consistency in the secondary outcomes utilised by studies. The most frequently used secondary outcomes were self-esteem (50%), coping skills (41.7%), empowerment (41.7%) and functioning (41.7%). In order to develop the evidence base of internalised stigma interventions, consistent core measures should be employed.

Examination of primary and secondary outcomes

Primary outcome Internalised stigma

Internalised stigma was examined by all studies included in the review. Both CTs and one pre/post CS found significant improvements in internalised stigma individually, and no RCTs found significant individual improvements. A meta-analysis was conducted with five RCTs (n=200) that had available data (figure 2 and 3). Analysis did not suggest a significant difference in internalised stigma between groups at end of therapy, although analysis was favouring the internalised stigma intervention (Hedges' g 0.24, 95% CI -0.06 to 0.53, p = 0.11). Heterogeneity between studies was low (Q=0.783, P=0.941, I^2 = 0.000). Similarly, at follow-up (ranging from 3 week to 4 months) there was no significant difference in internalised stigma between groups, although the analysis favoured the internalised stigma intervention (Hedges' g 0.21, 95% CI -0.08 to 0.50, p=0.16). Heterogeneity was also low for this time point (Q=0.352, P=0.986, I^2 = 0.000).

Secondary outcomes

In order to focus on the most important secondary outcomes, outcomes which had at least three or more studies contributing to an outcome were examined in the meta-analysis. Table 4 outlines the outcomes examined and whether the individual studies found a significant or non-significant result favouring the intervention.

The random effects models and effect sizes for the secondary outcomes are outlined in figures 4 – 7. RCTs examining depression, empowerment, hopelessness, recovery and self-esteem were entered into a meta-analysis to examine end of therapy outcome of self-esteem. No significant findings were identified.

Self-efficacy was examined by three RCTs, two found a significant improvement in self-efficacy at the end of therapy. Two RCTs with available data (N= 89) were entered into a meta-analysis. Self-efficacy was shown to significantly favour the internalised stigma intervention following therapy (Hedges' g 0.49, 95% CI 0.07 to 0.91, p=0.02). This was not maintained at follow-up but the effect was favouring the intervention (Hedges' g 0.31, 95% CI -0.10 to 0.71, p=0.14).

Insight was examined by three studies, two RCTs and one CT. The CT and one RCT found an individual significant difference favouring the intervention. The two RCTs (N=70) were entered into a meta-analysis. At the end of therapy there was a significant outcome favouring the internalised stigma intervention (Hedges' g 0.43, 95% CI 0.04 to 0.83, p=0.03). This significant treatment effect was not maintained at follow-up (Hedges' g 0.28, 95% CI -0.12 to 0.68, p=0.17).

Coping skills included outcomes which examined ways people responded and coped with stigma and their related mental health difficulties. The outcomes examined varied quite considerably across included studies. Studies looked at outcomes such as secrecy, withdrawal, distancing, educating, positive views of disclosure, problem solving and avoidance coping. These outcomes were not entered into a meta-analysis due to the variability in outcomes.

Discussion

This study aimed to conduct a systematic narrative review and meta-analysis of psychosocial interventions for internalised stigma with schizophrenia-spectrum diagnoses. A total of 12 studies were included in the review, 7 RCTs, 3 CSs and 2 CTs. This review is the first of its kind examining the efficacy of internalised stigma interventions specifically in schizophrenia-spectrum diagnoses. The review has to be interpreted tentatively due to the relatively small number of studies with small sample sizes which were included.

Examination of the interventions revealed that psychoeducation, thought challenging, connecting with peers and social skills training were the most commonly used techniques within the psychosocial interventions. It was beyond the scope of this review to statistically examine which interventions significantly predicted outcome due to the paucity of studies. In a recent narrative review of internalised stigma interventions for SMI, Yanos et al (2014) similarly found that psychoeducation and cognitive challenging were key components of all interventions. Furthermore, in a recent examination of service user perspectives of participation in the (Morrison et al., in press) internalised stigma CBT intervention, a number of specific change mechanisms were highlighted as essential in the therapeutic process (Wood et al., in press). Psychoeducation and normalisation were identified by service users as important mechanisms within therapy. The review findings tentatively support the use of previously identified change mechanisms.

Few of the interventions were specifically designed for people with a schizophrenia-spectrum diagnosis. The majority of internalised stigma studies were for SMI rather than those with a schizophrenia-spectrum diagnosis per se. Less than half of studies included in this review had specific interventions for this group. Other studies included participants who experienced chronic depression, anxiety, bipolar disorder and personality disorders (Link et al., 2002; Lucksted et al., 2011; Roe et al., 2014; Rusch et al., 2014; Russinova et al., 2014; Yanos et al., 2012). As outlined, the stigma experienced by those with schizophrenia-spectrum diagnosis is likely to be conceptually different to those with other psychiatric diagnoses (Oliveria et al., 2015). Moreover, psychological interventions are commonly developed for specific presentations in order to maximise their efficacy. For example, the cognitive models of psychosis (Morrison, 2001) and bipolar (Mansell, 2007) have distinctive differences in the conceptualisation their respective presentations. This has a number of potential consequences for the efficacy of the intervention as a) people with a schizophrenia-spectrum diagnosis may have not felt as comfortable sharing their experiences with the group, especially if they were in the minority, and b) the intervention itself may have not been tailored to their specifics needs in relation to internalised stigma.

The Morrison et al. (in press) study was the only to offer individual CBT for internalised stigma; all others offered a group intervention. There are a number of advantages of an individual therapy which may be helpful in alleviating internalised stigma. A particular advantage is the ability to develop an idiosyncratic formulation. A formulation has been highlighted as an essential part of CBT by therapists ensuring that therapy goals are targeted to a service user's individual needs (Morrison and Barratt, 2010). Exploration of service user experiences of the Morrison et al. (in press) intervention indicated that flexible goal setting was essential to the efficacy of the intervention (Wood et al., in press). Further RCTs are required examining the efficacy of individual interventions for internalised stigma.

The primary outcome of internalised stigma was found to be significantly improved by two CTs and one pre/post CS but not significant in the meta-analysis at end of therapy or follow-up. The most methodologically robust study found the largest effect favouring the internalised stigma intervention (Morrison et al., in press). Internalised stigma has been highlighted to be extremely prevalent in those with mental health difficulties, including schizophrenia-spectrum diagnoses (Brohan et al., 2010a). It has been highlighted as an important factor negatively impacting on people's mental health, self-esteem, levels of depression and hopelessness(Livingston and Boyd, 2010) and therefore is an important outcome to target in psychological therapy. It is essential this is continued to be examined as a primary outcome in internalised stigma interventions.

This meta-analysis identified that internalised stigma, self-esteem, and empowerment illustrated an overall effect favouring the internalised stigma intervention, and self-efficacy and insight had a significant effect after the internalised stigma intervention. This would suggest that these outcomes are important in capturing the efficacy of an internalised stigma intervention. Although the overall effect did not near significance for other outcomes, depression, hopelessness and recovery were found to have a small effect favouring the internalised stigma intervention in the Morrison et al(2015) study. This study found an individual significant effect for personal recovery measured on the process of recovery questionnaire(Neil et al., 2009). This study was found to be the most methodologically robust study with little bias detected indicating that these outcomes may also be important in assessing the efficacy of an internalised stigma intervention.

One of the limitations of the review was the small studies that were included. In a meta-analysis, small studies can fail to detect a modest intervention effect due to the lack of power within each individual studies (Borenstein et al., 2009). Conversely, small studies can also have "small-study effects" as small studies are likely to suffer from publication bias and only be published if they are significant (Hutton and Taylor, 2014). Small studies are also more likely to suffer from

methodological flaws. This review included studies which illustrated heterogeneity although the small study numbers did not facilitate reliable examination of heterogeneity. Examination of the funnel plots highlights large confidence intervals and variability in effect sizes illustrating clinical and methodological heterogeneity respectively. The small number of studies within this review also meant that tests for publication bias could not be performed. Ioannidis and Trikalinos (2007) recommend at least 10 trials for enough power to perform such analysis. There were only 5 studies eligible for the meta-analysis and these were all with small samples (N range 27 – 66). Nevertheless, meta-analysis of small studies within a limited evidence base is advantageous as long as sensitivity analyses are considered (IntHoult et al., 2015).

The comprehensive sythesis of a limited evidence base of internalised stigma interventions for schizophrenia-spectrum diagnosis was a considerable strength of the review. The review synthesised data on outcome measures, key mechanisms of change within internalised stigma interventions, and meta-analysed a relatively large sample to identify effect sizes of internalised stigma interventions. This facilitated the identification of a number of recommendations for future trials of internalised stigma interventions.

Future research

In terms of the population examined, over half of the studies included in this review did not exclusively examine participants with a schizophrenia-spectrum diagnosis. It would be important to examine the efficacy of an internalised stigma intervention in large scale RCTs exclusively with this presentation, such as people who experience first episode psychosis, severe and enduring psychosis, and at risk groups as stigma is a prevalent issue in all these groups (McCay et al., 2007; Morrison et al., 2015).

The review tentatively suggests that the development of more targeted interventions for internalised stigma may be helpful. The majority of interventions to date have not directly targeted internalised stigma idiosyncratically through the development of a formulation. A number of large scale RCTs are required to examine the efficacy of the diverse psychosocial interventions included in this review. All studies included in this review had relatively small sample sizes and did not have enough power to find significant results on the internalised stigma outcome. All intervention types would benefit from further examination in a large-scale trial. Potentially, one of the most important interventions to examine is CBT given that it is the first line recommended psychological intervention for people with a schizophrenia-spectrum diagnosis(NICE, 2014). As stated, psychoeducation,

normalisation, and cognitive restructuring of stigma were the most frequently used change mechanisms with study interventions, all of which are encompassed within a CBT approach.

The refinement and validation of an internalised stigma outcome measure which is specific to people with a schizophrenia-spectrum diagnosis and meets all reliability and validity (Terwee et al., 2007) could also improve outcome. As Brohan et al (2010b) stated, there is not a measure of internalised stigma which meets all reliability and validity criteria required for an outcome measure. Being able to identify the efficacy of an internalised stigma intervention would depend on a measure which is sensitive and specific to change. Best practise also states that outcome measures should also be developed in consultation with service users (Trivedi and Wykes, 2002).

In conclusion, internalised stigma interventions could show promise in alleviating internalised stigma in people with a schizophrenia-spectrum diagnosis. However the studies were limited by the small sample size, small effect sizes, and the lack of methodological rigor in some of the studies included in the review. Further large-scale RCTs need to be conducted in order to examine the efficacy of internalised stigma interventions exclusively with people with a schizophrenia-spectrum diagnosis. Outcome measures should include measures of internalised stigma, recovery, self-esteem, empowerment, self-efficacy, and coping skills.

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Figure 1 –PRISMA diagram of search strategy

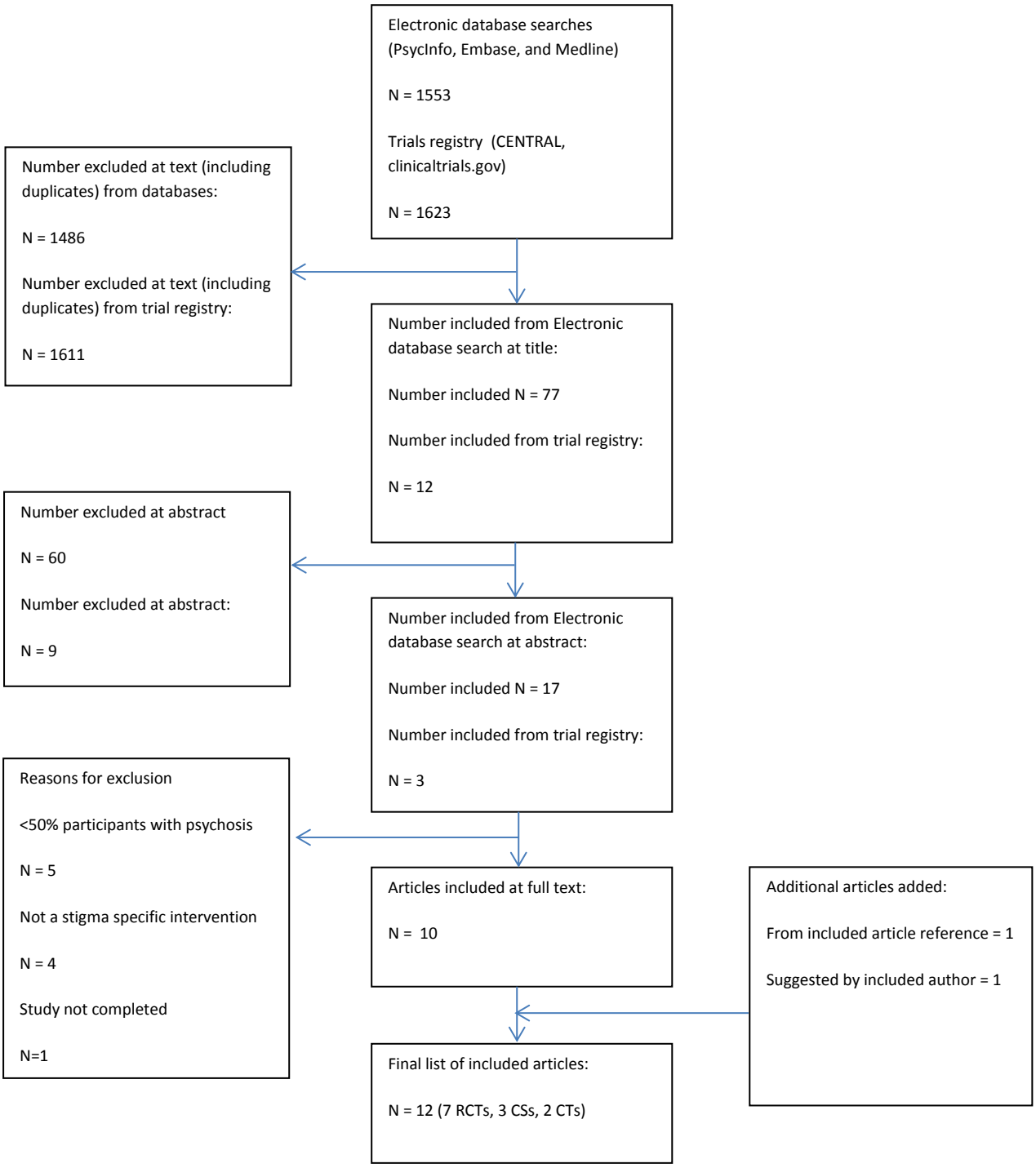


Table 1 – studies included in the systematic review

Randomised controlled trials									**Baseline demographics (total sample)**			
Author	**Study design**	**Intervention**	**Number randomised**	**Dropouts (at ET)**	**Modality**	**Sessions offered (weeks)**	**Primary measure of self-stigma**	**Location (city)**	**Schizophrenia related Diagnosis, n (%)**	**Age(years), Mean (SD)**	**Female, n (%)**	**Follow-up data available**
Link et al (2002)	RCT	SPE Control	88 N/R	18 (20.45%)	Group	16 (8)	PDD	USA	S, 36.4% NAP, 13.6%	40.9 (n.s.)	34 (38.6%)	B, ET, 18
McKay et al (2007)*	RCT	MSI TAU	41 26	12 (29.3%) 8 (30.8%)	Group	12 (12)	MES	Canada (Toronto)	FEP 100%	25.07 (4.86) 26.17 (7.03)	9 (31.0%) 4 (22.2%)	B, ET
Yanos et al (2011)	RCT	NECT TAU	21 18	5 (23.8%) 2 (11.1%)	Group	20 (20)	ISMI	USA (New York, Indiana)	S, 28.2%, SA, 48.7%	47.14 (7.86) 48.06 (6.78)	7 (33.3%) 4 (22.2%)	B, ET, 3
Fung et al (2011), Tsang et al (2014)	RCT	SSRP NRG	34 32	0 (0.0%) 2 (6.3%)	Group	16, 12 group, 4 1:1 (16)	CSSMIS	Hong Kong	S 100%	43.91 (10.38) 46.91 (8.92)	16 (47.1%) 13 (40.6%)	B, ET, 2, 4, 6
Rusch et al (2014)**	RCT	COP TAU	16 11	2 (12.5%) 0 (0.0%)	Group	3 (3)	ISMI	Switzerland (Zurich)	SSD 100%	44.69 (11.62) 38.36 (7.22)	8 (50.00%) 5 (38.46%)	B, ET, 3wk
Russinova et al (2014)**	RCT	API WLC	14 14	1 (7.1%) 2 (14.3%)	Group	10 (10)	ISMI	USA	SSD 100%	46.32 (12.66) 48.14 (11.39)	10 (71.4%) 10 (71.4%)	B, ET, 3
Morrison et al (2015)	RCT	CBT TAU	15 14	2 (13.3%) 1 (7.1%)	Individual	12 (16)	ISMI-R	UK (Manchester)	S, 31%, FEP 47% RP 3%	39.00 (13.50) 29.36 (10.02)	3 (20.0%) 3 (21.4%)	B, ET, 3
Controlled trials and cohort studies									**Baseline demographics (total sample)**			
Author	**Study design**	**Intervention**	**Number allocated**	**Dropouts**	**Modality**	**Sessions offered (weeks)**	**Primary measure of self-stigma**	**Location (country)**	**Schizophrenia related diagnosis, n (%)**	**Age(years), Mean (SD)**	**Female, n (%)**	**Follow-up data available**
Knight et al (2006)	Time series	CBT	21	2 (9.5%)	Group	7 (7)	PDD	UK (London)	S 38.%, PS 57.1%, SA 4.8%	39.32 (8.79)	10 (47.6%)	B, ET, 6wk
Lucksted et al (2011)	Cohort	ESS	50	16 (32.0%)	Group	9 (9)	ISMI	USA	S 41.17%, SA, 8.82%, P 5.88%	51.56 (7.18)	3 (18.8%)	B, ET
Sousa et al (2012)*	Cohort	SD&EL	21	4 (19.0%)	Group	15 group, 15 online	ISMI	Portugal	S 100%	38.1 (8.7)	2 (11.77%)	B, ET
Uchino et al (2012)	Controlled trial	PE SC	29 27	NR	Group	6 (6)	SDS-J	Japan	S 92.9%, SA, 7.1%	35.6(10.4) 32.8 (10.5)	NR	ET
Roe et al (2014)*	Controlled trial	NECT TAU	137 85	74 (54.0%) 29 (34.1%)	Group	20 (20)	ISMI	Israel	Author approximates majority	39 (12.1) 44 (12.3)	33 (52%) 32 (57%)	B, ET

CBT cognitive behaviour therapy, CCMIS Chinese Version of the Self-stigma of Mental Illness Scale, COP coming out proud, DDS Devaluation-Discrimination Scale, ESS Ending Self-Stigma Intervention, ET end of therapy , FEP first episode psychosis, , ISE Index of Self Esteem, ISMI Internalised Stigma of Mental Illness Scale, , ISMI-R Internalised Stigma of Mental Illness Scale Revised, MSI Manualised stigma intervention, MES Modified Engulfment Scale, NAP Non-affective psychosis , NECT Narrative Enhancement Cognitive Therapy, N/R Not reported, NRG Newspaper Reading group, PDD Perceived Devaluation and Discrimination Scale, PE Psychoeducation, , RP recurrent psychosis, SA schizoaffective disorder, SC Standard care, SDS-J Social Distance Scale Japan, SSRP Self-stigma reduction programme, TAU treatment as usual, WLC Waiting list control, S Schizophrenia

*Baseline demographics do not include drop outs, **Data reported is only for the participants diagnosed with a schizopreniform diagnosis.

Table 2 – Assessment of bias

Study	**Selection Bias**	**Study design**	**Confounders**	**Blinding**	**Data collection methods**	**Withdrawals /drop outs**	**Global rating**
Randomised controlled trials							
Link et al (2002)	M (2)	S (1)	W(3)	W(3)	S (1)	M (2)	**W(3)**
McKay et al (2007)	M (2)	S (1)	S (1)	M (2)	S (1)	S (1)	**S (1)**
Yanos et al (2011)	M (2)	S (1)	S (1)	S (1)	S (1)	M (2)	**S (1)**
Fung et al (2011), Tsang et al (2014)	M (2)	S (1)	S (1)	M (2)	S (1)	S (1)	**S (1)**
Rusch et al (2014)	M (2)	S (1)	S (1)	M (2)	S (1)	S (1)	**S (1)**
Russinova et al (2014)	M (2)	S (1)	S (1)	M (2)	S (1)	S (1)	**S (1)**
Morrison et al (2015)	S (1)	S (1)	S (1)	S (1)	S (1)	S (1)	**S (1)**
Controlled trials and cohort studies							
Lucksted et al (2011)	M (2)	W(3)	W(3)	W(3)	S (1)	M (2)	**W(3)**
Sousa et al (2012)	M (2)	W(3)	W(3)	W(3)	S (1)	S (1)	**W(3)**
Uchino et al (2012)	M (2)	M (2)	W(3)	W(3)	S (1)	M (2)	**W(3)**
Knight et al (2006)	M (2)	W(3)	W(3)	W(3)	S (1)	S (1)	**W(3)**
Roe et al (2014)	M (2)	M (2)	W(3)	W(3)	S (1)	W(3)	**W(3)**

W – Weak, M-Moderate, S-Strong

Table 3 – Outcomes measured and tools used

Author	Self-stigma	General stigma	Stigma Stress	Coping skills	Recovery	Functioning	Psychopathology	Depression	Hopelessness	Anxiety	Self-Esteem	Empowerment	Self-efficacy	Shame	Knowledge	Treatment adherence	Insight	Social Support	Change	Total outcomes
Link et al (2002)	PDD SRF	SRER	-	ACWS	-		-	CESD	-	-	RSES	-	-	-	-	-	-	-	-	**6**
McKay et al (2007)	MES PDD		-	-		QLS GAF	PANSS	-	MHS	-	RSES	TSCS	SES	-	-	-	-	-	-	**9**
Yanos et al (2011)	ISMI	-	-	CSC		QLS	PANSS	-	BHS	-	RSES	-	-	-	-	-	SUMD	-	-	**7**
Fung et al (2011), Tsang et all (2014)	CSSM IS	-	-	-	-			-	-	-	-	-	CGSS	-	-	-	SUMD	-	CAQ	**4**
Rusch et al (2014)	ISMI	-	SS	LSS COMIS	-		-	-	-	-	-	RES	-	-	-	-	-	-	-	**5**
Russinova et al (2014)	ISMI	-	-	ACWS	PGRS		-	CESD	-	-	-	RES	SES	-	-	-	-	-	-	**6**
Morrison et al (2015)	ISMI SIMS	KSS	-	-	QPR-S		-	BDI-PC	BHS	SIAS	SERS	-	-	ISS	-	-	-	-	-	**9**
Controlled trials and cohort studies																				
Lucksted et al (2011)	ISMI	-	-	-	MHRM		-	-	-	-	-	RES	-	-	-	-	-	PSS	-	**4**
Uchino et al (2012)	SDS	-	-	-		GAF	-	-	-	-	-	-	-	-	KIDI	DAI	BPIS	-	-	**5**
Sousa et al (2012)	ISMI	-	-	-		CORE (F)	CORE (S)	-	-	-	-	-	-	-	-	-	-	-	-	**2**
Knight et al (2006)	PDD	-	-	CCS	-		PANSS	BDI	-	-	ISE	RES	-	-	-	-	-	-	-	**6**
Roe et al (2014)	ISMI	-	-	-		MANSA	-	-	ADHS	-	RSES	-	-	-	-	-	-	-	-	**4**
N (%) studies examining outcome	**12 (100)**	**2 (16.7)**	**1 (8.3)**	**5 (41.7)**	**3 (25)**	**5 (41.7)**	**4 (33.3)**	**4 (33.3)**	**4 (33.3)**	**1 (8.3)**	**6 (50)**	**5 (41.7)**	**3 (25)**	**1 (8.3)**	**1 (8.3)**	**2 (16.7)**	**3 (25)**	**1 (8.3)**	**1 (8.3)**	

PDD – Perceived Devaluation-Discrimination scale (Link et al., 1991; Link et al., 2002), SRER – Self-Reported Experiences of Rejection (Link et al., 2002) , SRF – Stigma Related Feelings (Link et al., 2002), MES - Modified Engulfment Scale (McCay and Seeman, 1998) ISMI - Internalised Stigma of Mental Illness Scale (Ritscher and Phelan, 2004), CSSMIS – Chinese Self-Stigma of Mental Illness Scale (Fung et al., 2007), KSS –

King Stigma Scale (King et al., 2007), SIMS – Service user Interview Measure of Stigma (Wood et al., in prep), SDS – Social Distance Scale (Whatley, 1959), ACWS – Approaches to Coping with Stigma (Link et al., 2002), CSC- Coping with Symptoms Checklist (Yanos et al., 2003), LSS – Link Secrecy Scale (Link et al., 2002), COMIS – Coming Out with Mental Illness Scale (Corrigan et al., 2010), CCS – Cybernetic Coping Scale (Edwards and Baglioni, 1993), QLS – Quality of Life Scale (Henrichs et al., 1984), GAF – Global Assessment of Functioning (Endicott et al., 1976), PGRS – Personal Growth and Recovery Scale (Russinova et al., 2014), QPR-S – Process of Recovery Short Form (Law et al., 2014), MHRM – Mental Health Recovery Measure (Young et al., 1999), CORE – Clinical Outcome and Routine Evaluation Measure (Evans et al., 2000), MANSA – Manchester Short Assessment of Quality of Life (Priebe et al., 1999), PANSS – Positive and Negative Syndrome Scale (Kay et al., 1987), CESD – Centre of Epidemiological Studies Depression (Radloff, 1977), BDI-PC – Beck Depression Inventory for Primary Care (Winter et al., 1999), BDI – Beck Depression Inventory (Beck et al., 1961), MHS – Miller Hope Scale (Miller and Powers, 1988), BHS – Beck Hopelessness Scale (Beck et al., 1974), ADHS – Adult Dispositional Hope Scale (Snyder et al., 1991), SS – Stigma Stress Scale (Lazarus and Folkman, 1984), SIAS – Social Interaction Anxiety Scale (Mattick and Clarke, 1998), RSE – Rosenberg Self-Esteem Scale (Rosenberg, 1979), SERS – Self-Esteem Rating Scale (Lecomte et al., 2006), TSCS – Tennessee Self-Concept Scale (Fitts and Warren, 1996), RES – Rogers Empowerment Scale (Rogers et al., 1997), Self-Efficacy Scale (Sherer et al., 1982), CGSS – Chinese General Self Efficacy Scale (Chiu, 2004), GSES – General Self-Efficacy Scale (Scwarzer and Jerusalem, 1995), ISS – Internalised Shame Scale (Cook, 1987), KIDI – Knowledge of Illness and Drugs Inventory (Maeda et al., 1992), DAI – Drug Attitude Inventory (Hogan et al., 1983), SUMD – Scale to Assess Unawareness of Mental Disorders (Amador et al., 1993), BPIS – Birchwood Psychosis Insight Scale(Birchwood et al., 1994), PSS – Perceived Social Support (Zimet et al., 1988), CAQ – Change Assessment Questionnaire (Hilburger, 1995).

Table 4 – Significant outcomes (total scores) of self-stigma intervention end of therapy

Author	Self-stigma	Coping skills	Recovery	Functioning	Pathology	Depression	Hopelessness	Social Anxiety	Self-Esteem	Empowerment	Self-efficacy	Insight
Link et al (2002)	×	×	-	-	-	NR	-	-	NR	-	-	-
McKay et al (2007)	×	-	-	✓	NR	✓	-	-	NR	NR	NR	-
Yanos et al (2011)	×	✓	-	×	×	-	×	-	×	-	-	×
Fung et al (2011)	×	-	-	-	-	-	-	-	×	-	✓	✓
Rusch et al (2014)	×	✓	-	-	-	-	-	-	-	×	-	-
Russinova et al (2014)	×	✓	×	-	-	×	-	-	-	×	✓	-
Morrison et al (2015)	×	-	✓	-	-	✓	✓	×	×	-	-	-
Controlled trials and cohort studies												
Lucksted et al (2011)	✓	-	✓	-	-	-	-	-	-	×	-	-
Uchino et al (2012)	✓	-	-	×	-	-	-	-	-	-	-	✓
Sousa et al (2012)	×	-	-	✓	×	-	-	-	-	-	-	-
Knight et al (2006)	×	×	-	-	✓	✓	-	-	✓	×	-	-
Roe et al (2014)	✓	-	-	✓	-	-	×	-	✓	-	-	-

NA-Data not in published paper as study used <50% people with psychosis, NR – Not reported, ✓- Significant result favouring stigma intervention, × - non significant difference, - outcome not examined

Figure 2 – Internalised Stigma (IS) meta-analysis output for end of therapy

Study name	Outcome	Time point	Hedges's g	Lower limit	Upper limit	p-Value	Experimental	Control
MORRISON2015	Combined	End of therapy	0.48	-0.28	1.23	0.22	13	13
FUNG2011	Combined	End of therapy	0.21	-0.28	0.70	0.40	34	30
YANOS2012	ISMI Total	End of therapy	0.33	-0.33	1.00	0.32	18	16
RUSCH2014	ISMI Total	End of therapy	0.08	-0.68	0.85	0.83	14	11
RUSSINOVA2014	ISMI Total	End of therapy	0.09	-0.67	0.84	0.83	13	12
			0.24	-0.06	0.53	0.11		

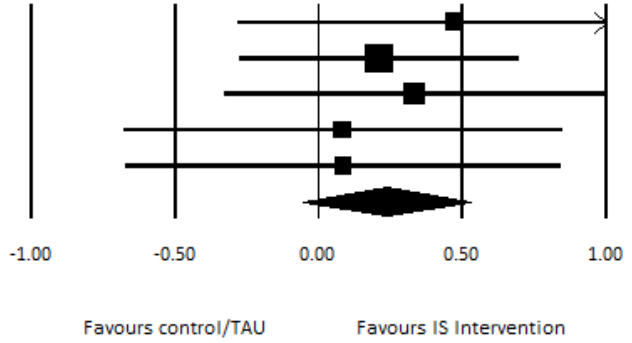


Figure 3 – Internalised Stigma (IS) meta-analysis output for follow-up

Study name	Outcome	Time point	Hedges's g	Lower limit	Upper limit	p-Value	Experimental	Control
MORRISON2015	Combined	3 month	0.31	-0.42	1.05	0.41	14	13
FUNG2011	Combined	4 month	0.15	-0.34	0.64	0.54	34	30
YANOS2012	ISMI Total	3 month	0.35	-0.36	1.06	0.33	17	13
RUSCH2014	ISMI Total	3 week	0.17	-0.59	0.94	0.65	14	11
RUSSINOVA2014	ISMI Total	3 month	0.12	-0.63	0.87	0.75	13	13
			0.21	-0.08	0.50	0.16		

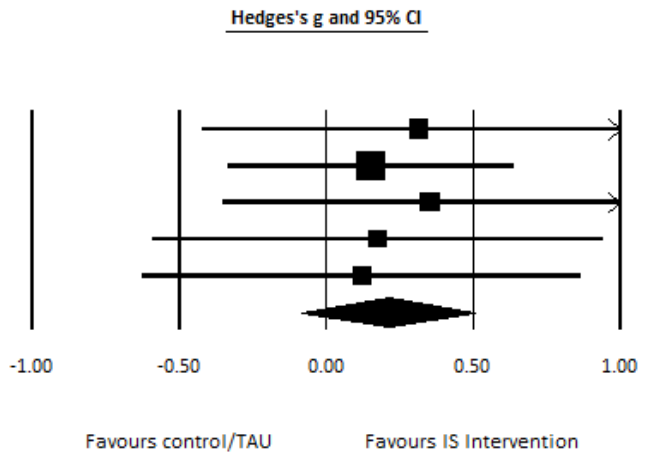


Figure 4 – Random effects model of secondary outcomes at end of therapy

Group by Outcome	Study name	Outcome	Time point	Statistics for each study				Sample size	
				Hedges's g	Lower limit	Upper limit	p-Value	Experimental	Control
Depression	MORRISON2015	Depression	End of therapy	0.58	-0.18	1.34	0.14	13	13
Depression	RUSSINOVA2014	Depression	End of therapy	0.25	-0.52	1.01	0.53	13	12
Depression				0.41	-0.13	0.95	0.13		
Empowerment	RUSCH2014	Empowerment	End of therapy	0.23	-0.54	0.99	0.56	14	11
Empowerment	RUSSINOVA2014	Empowerment	End of therapy	0.42	-0.35	1.19	0.29	13	12
Empowerment				0.32	-0.22	0.86	0.24		
Hopelessness	MORRISON2015	Hopelessness	End of therapy	0.61	-0.15	1.37	0.12	13	13
Hopelessness	YANOS2012	Hopelessness	End of therapy	0.00	-0.66	2.00	1.00	18	16
Hopelessness				0.27	-0.32	0.87	0.37		
Recovery	MORRISON2015	Recovery	End of therapy	1.08	0.28	1.88	0.01	13	13
Recovery	RUSSINOVA2014	Recovery	End of therapy	0.09	-0.67	0.85	0.81	13	12
Recovery				0.58	-0.39	1.55	0.24		
Self-efficacy	FUNG2011	Self-efficacy	End of therapy	0.63	0.14	1.12	0.01	34	32
Self-efficacy	RUSSINOVA2014	Self-efficacy	End of therapy	0.16	-0.60	0.92	0.68	13	12
Self-efficacy				0.49	0.07	0.91	0.02		
Self-esteem	MORRISON2015	Self-esteem	End of therapy	0.34	-0.41	1.09	0.38	13	13
Self-esteem	YANOS2012	Self-esteem	End of therapy	0.10	-0.56	0.76	0.77	18	16
Self-esteem				0.20	-0.29	0.70	0.42		

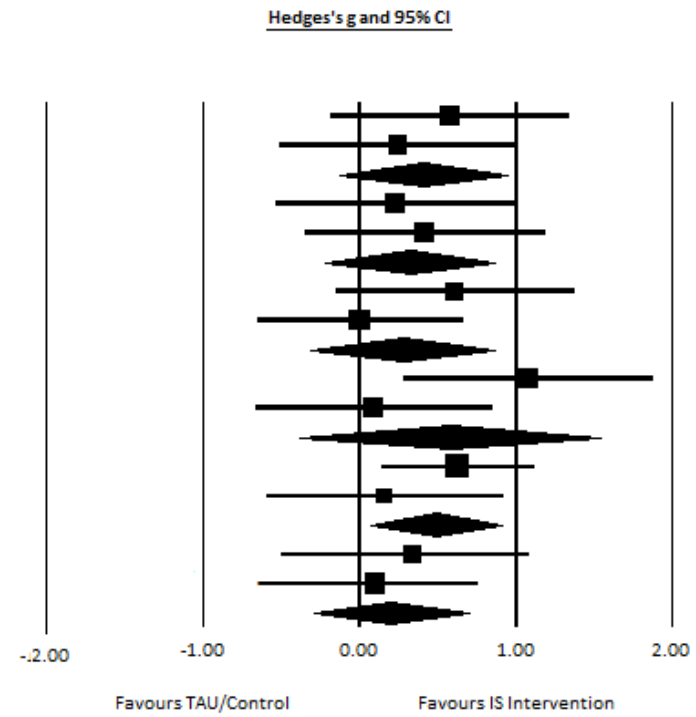


Figure 5 - Random effects model of secondary outcomes at follow-up

Group by Outcome	Study name	Outcome	Time point	Statistics for each study				Sample size	
				Hedges's g	Lower limit	Upper limit	p-Value	Experimental	Control
Depression	MORRISON2015	Depression	3 month	0.02	-0.71	0.75	0.96	14	13
Depression	RUSSINOVA2014	Depression	3 month	0.22	-0.53	0.97	0.56	13	13
Depression				0.12	-0.41	0.64	0.66		
Empowerment	RUSCH2014	Empowerment	3 week	0.35	-0.42	1.12	0.37	14	11
Empowerment	RUSSINOVA2014	Empowerment	3 month	0.24	-0.51	0.99	0.53	13	13
Empowerment				0.29	-0.24	0.83	0.28		
Hopelessness	MORRISON2015	Hopelessness	3 month	0.12	-0.62	0.85	0.76	14	13
Hopelessness	YANOS2012	Hopelessness	3 month	0.00	-0.70	0.70	1.00	17	13
Hopelessness				0.06	-0.45	0.56	0.83		
Recovery	MORRISON2015	Recovery	3 month	0.57	-0.18	1.32	0.13	14	13
Recovery	RUSSINOVA2014	Recovery	3 month	0.12	-0.63	0.86	0.76	13	13
Recovery				0.34	-0.18	0.87	0.20		
Self-efficacy	FUNG2011	Self-efficacy	4 month	0.40	-0.09	0.88	0.11	34	32
Self-efficacy	RUSSINOVA2014	Self-efficacy	3 month	0.08	-0.67	0.82	0.84	13	13
Self-efficacy				0.30	-0.10	0.71	0.14		
Self-esteem	MORRISON2015	Self-esteem	3 month	0.37	-0.37	1.10	0.33	14	13
Self-esteem	YANOS2012	Self-esteem	3 month	0.12	-0.56	0.80	0.73	17	15
Self-esteem				0.23	-0.27	0.73	0.36		

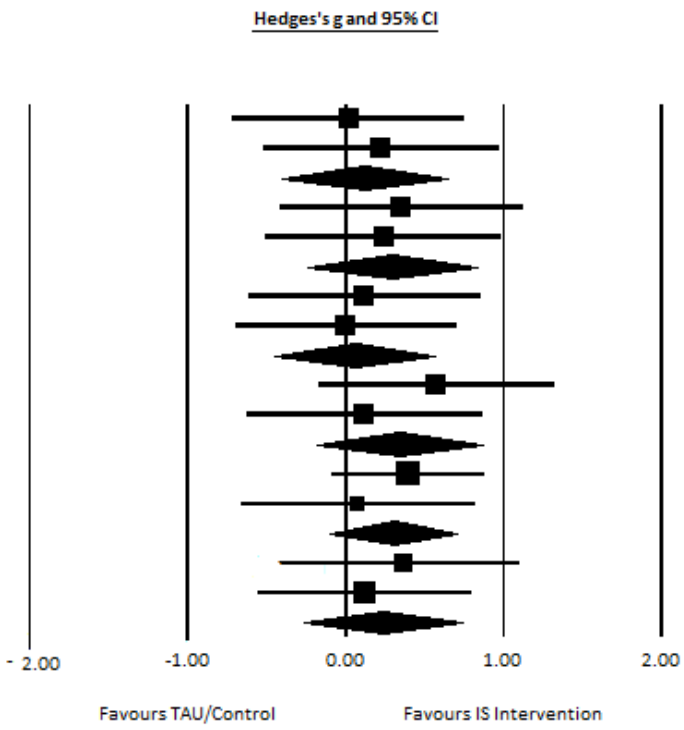


Figure 6 - Random effects model of insight at end of therapy

Study name	Outcome	Time point	Statistics for each study				Sample size	
			Hedges's g	Lower limit	Upper limit	p-Value	Experimental	Control
YANOS2012	Insight	End of therapy	0.17	-0.49	0.83	0.61	18	16
FUNG2011	Combined	End of therapy	0.59	0.09	1.09	0.02	34	30
			0.43	0.04	0.83	0.03		

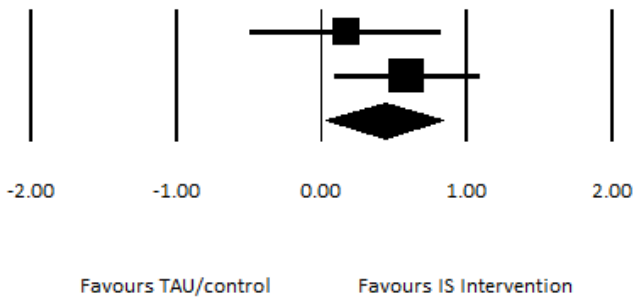
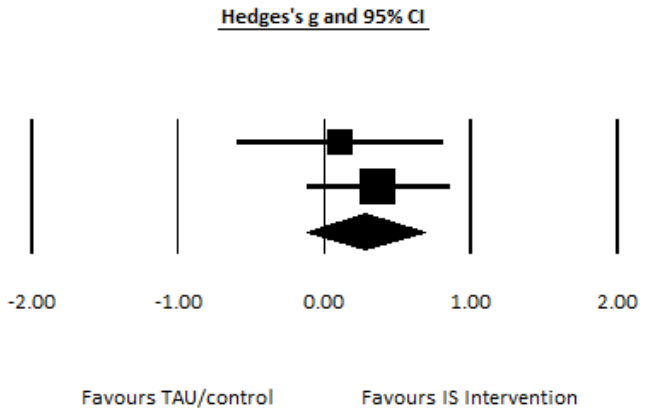


Figure 7 - Random effects model of insight at follow-up

Study name	Outcome	Time point	Statistics for each study				Sample size	
			Hedges's g	Lower limit	Upper limit	p-Value	Experimental	Control
YANOS2012	Insight	3 month	0.11	-0.60	0.81	0.77	17	13
FUNG2011	Combined	4 month	0.37	-0.12	0.86	0.14	34	30
			0.28	-0.12	0.68	0.17		



Appendix 1- Excluded studies at full text

- Shimostsu, S., Horikawa, N., Emura, R., Ishikawa, S., Nagao, A., Ogata, A., Hiejima, S., Hosomi, J. (2014) Effectiveness of group cognitive-behavioural therapy in reducing self-stigma in Japanese Psychiatric Patients. Asian Journal of Psychiatry, 10, 39 – 44
  Reason for exclusion: Not examining intervention with people diagnosed with a schizophrenia-spectrum diagnosis
- Brown, S. (2010) Implementing a brief hallucination simulation as a mental illness stigma reduction strategy. Community Mental Health Journal, 46, 500 – 504
  Reason for exclusion: Not examining intervention with people diagnosed with a schizophrenia-spectrum diagnosis
- Michaels, P., Corrigan, P.W., Buchholz, B., Brown, J., Arthur, T., Netter, C., MacDonald-Wilson, K. (2014) Changing stigma through a consumer-based stigma reduction program. Community Mental Health Journal, 50, 395-401.
  Reason for exclusion: Intervention was implemented with those who have severe mental illness and did not report diagnosis. Corresponding author contacted (13/12/2014) via email to ask if they were able to give diagnosis data. Author reported that this data was not collected and therefore publication does not meet criteria of ≥50% people who have a schizophreniform diagnosis.
- Luoma, J.B., & Kohlenberg, B.S. (2011) Slow and Steady Wins the Race: A Randomized Clinical Trial of Acceptance and Commitment Therapy Targeting Shame in Substance Use Disorders. *Journal of Consulting and Clinical Psychology*. 80, 1, 43-53.
  Reason for exclusion: Not examining intervention with people diagnosed with a schizophrenia-spectrum diagnosis
- Sibitz, I., Provaznikova, K., Lipp, M., & Lakeman, R. (2013) The impact of recovery-oriented day clinical treatment on internalized stigma: Preliminary report. Psychiatry Research. 326-332.
  Reason for exclusion: Intervention did not primarily focus on reducing internalised stigma.
- Morrison, A.P., Birchwood, M., Pyle, M., Flach, C., Stewart, S., Byrne, R., Patterson, P., Jones, P.B., Fowler, D., Gumley, A.I., French, P. (2013) Impact of cognitive therapy on internalised stigma in people with at-risk mental states. British Journal of Psychiatry. 203, 140 – 145
  Reason for exclusion: Intervention did not primarily focus on reducing internalised stigma.
- Aho-Mustonen, K., Tiihonen, J., Repo-Tihonen, Ryynanen, P., Miettinen, R., Raty, H. (2011) Group psychoeducation for long-term offender patients with schizophrenia: An exploratory randomised controlled trial. Criminal Behaviour and Mental Health. 21, 163-176.

Reason for exclusion: Intervention did not primarily focus on reducing internalised stigma.

- Shin, S., Lukens, E. (2002) Effects of psychoeducation for Korean Americans with chronic mental illness. Psychiatric Services. 53 (9), 1125 – 1131.
  Reason for exclusion: Intervention did not primarily focus on reducing internalised stigma.
- MacInnes, D.L., & Lewis, M. (2008) The evaluation of a short group programme to reduce self-stigma in people with serious and enduring mental health problems. *Journal of Psychiatric & Mental Health Nursing,* 15, 59 – 65
  Reason for exclusion: Author was contacted via email on three occasions but no response received. Therefore we were unable to ascertain whether ≥50% of participants had a schizophreniform diagnosis.
- Lucksted, A (ongoing) Ending Self Stigma: Randomized Trail to Reduce Internalized Stigma among People with SMI
  Reason for exclusion: Trial not yet complete.