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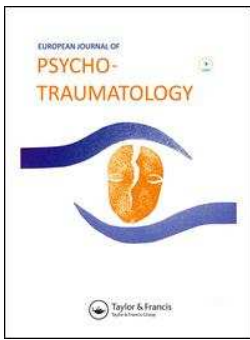
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Eye Movement Desensitization and Reprocessing (EMDR) for the treatment of psychosis: a systematic review

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ABSTRACT

Background: Psychosis is a public health concern. There is increasing evidence suggesting trauma can play a pivotal role in the development and maintenance of psychosis. Eye Movement Desensitization and Reprocessing (EMDR) is an effective treatment for trauma and could be a vital addition to the treatment of psychosis.

Objective: To explore the evidence for EMDR as a treatment for psychosis, focussing on the safety, effectiveness and acceptability of this intervention for this population.

Methods: Four databases (Cochrane, EMBASE, MEDLINE PsychINFO), and the Francine Shapiro Library were systematically searched, along with grey literature and reference lists of relevant papers. No date limits were applied as this is an area of emerging evidence. Studies were screened for eligibility based on inclusion and exclusion criteria. The included studies were quality assessed and data was extracted from the individual studies, and synthesized using a narrative synthesis approach.

Results: Six studies met the inclusion criteria (1 RCT, 2 Pilot studies, 2 Case series and 1 Case report). Across the studies EMDR was associated with reductions in delusional and negative symptoms, mental health service and medication use. Evidence for reductions in auditory hallucinations and paranoid thinking was mixed. No adverse events were reported, although initial increases in psychotic symptoms were observed in two studies. Average dropout rates across the studies were comparable to other trauma-focused treatments for PTSD. The acceptability of EMDR was not adequately measured or reported.

Conclusion: EMDR appears a safe and feasible intervention for people with psychosis. The evidence is currently insufficient to determine the effectiveness and acceptability of the intervention for this population. Larger confirmative trials are required to form more robust conclusions.

Desensibilización y reprocesamiento por movimientos oculares (EMDR) para el tratamiento de la psicosis: Una revisión sistemática

Antecedentes: La psicosis es un problema de salud pública. Cada vez hay más evidencia sugiriendo que el trauma puede desempeñar un papel fundamental en el desarrollo y mantenimiento de la psicosis. La desensibilización y reprocesamiento por movimiento ocular (EMDR en su sigla en inglés) es un tratamiento efectivo para el trauma y podría ser una adición vital al tratamiento de la psicosis.

Objetivo: explorar la evidencia de EMDR como tratamiento para la psicosis, enfocándose en la seguridad, efectividad y aceptabilidad de esta intervención para esta población.

Métodos: Se realizaron búsquedas sistemáticas en cuatro bases de datos (Cochrane, EMBASE, MEDLINE PsychINFO) y la Biblioteca Francine Shapiro, junto con literatura gris y listas de referencias de artículos relevantes. No se aplicaron límites de fecha ya que esta es un área con evidencia emergente. Los estudios se seleccionaron determinando su elegibilidad según los criterios de inclusión y exclusión. Los estudios incluidos fueron evaluados de acuerdo a su calidad y los datos se extrajeron de los estudios individuales y se sintetizaron utilizando un enfoque de síntesis narrativa.

Resultados: Seis estudios cumplieron los criterios de inclusión (1 ensayo controlado aleatorio, 2 estudios piloto, 2 series de casos y 1 informe de caso). En todos los estudios, EMDR se asoció con reducciones en los síntomas delirantes y negativos, el servicio de salud mental y el uso de medicamentos. La evidencia de reducciones en las alucinaciones auditivas y el pensamiento paranoico fue mixta. No se informaron eventos adversos, aunque se observaron aumentos iniciales en los síntomas psicóticos en dos estudios. Las tasas promedio de abandono en los estudios fueron comparables a otros tratamientos centrados en el trauma para el TEPT. La aceptabilidad de EMDR no se midió ni informó adecuadamente.

Conclusión: EMDR parece una intervención segura y factible para personas con psicosis. La evidencia es actualmente insuficiente para determinar la efectividad y la aceptabilidad de la intervención para esta población. Se requieren ensayos confirmatorios más grandes para formar conclusiones más sólidas.

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PALABRAS CLAVE

EMDR; Psicosis; trauma; Revisión sistemática; intervención psicológica

关键词

EMDR; 精神病; 创伤; 系统综述; 心理干预

HIGHLIGHTS

- EMDR was associated with reductions in paranoid thinking, auditory hallucinations, delusional and negative symptoms of psychosis.
- EMDR was also associated with more remissions from psychotic disorders, and considerably fewer readmissions to hospital at 2-year follow-up.

眼动脱敏与再加工 (EMDR) 治疗精神病:一项系统综述

背景: 精神病是一个公共卫生问题。越来越多的证据表明, 创伤可以在精神病的发展和维持中起关键作用。眼动脱敏与再加工 (EMDR) 是一种针对创伤的有效疗法, 可能是精神病治疗方法的一个重要补充。本综述探究了EMDR作为精神病治疗方法的证据, 重点关注了此干预措施对精神病群体的安全性, 有效性和可接受性。

目的: 探索 EMDR作为精神病治疗的证据, 重点在于安全性, 有效性和 此干预措施对此人群的可接受性。

方法: 系统搜索了四个数据库 (Cochrane, EMBASE, MEDLINE 和PsychINFO), Francine Shapiro 图书馆, 以及灰色文献和相关论文的参考文献。没有设置日期限制, 因为这是一个新兴证据领域。根据入组和排除标准对各研究的资格进行筛选。对纳入的研究进行质量评估, 从单个研究中提取数据, 并使用叙述性综合法进行综合处理。

结果: 6项研究符合纳入标准 (1项RCT, 2项试点研究, 2项病例研究和1例病例报告)。在整个研究中, EMDR与妄想和消极症状, 精神卫生服务和药物使用的减少有关。幻听和偏执思维减少的证据混杂。尽管在两项研究中观察到精神病性症状最初有所增加, 但未报告不良事件。各研究的平均流失率与其他PTSD聚焦创伤疗法相当。EMDR的可接受性没有得到充分的测量或报告。

结论: EMDR对于精神病患者似乎是一种安全可行的干预措施。当前证据不足以确定对该群体进行干预的有效性和可接受性。需要更大规模的验证性试验才能得出更可靠的结论。

1. Introduction

The prevalence of psychotic symptoms indicates a potential public health concern (Nuevo et al., 2012). It is estimated that around one in 150 people will receive a diagnosis for a psychotic disorder during their lifetime (Moreno-Kustner, Martin, & Pastor, 2018), and the total societal cost for psychosis is anticipated to rise to £6.5 billion by 2026 (Kings Fund, 2008). The cause of psychosis is currently unclear and probably multifaceted. However, there is increasing evidence indicating that trauma experienced during childhood can play a pivotal role in the development and perpetuation of psychotic symptoms (Hardy, 2017; Varese et al., 2012). The literature suggests that exposure to traumatic experiences such as, physical abuse, bullying, sexual abuse, and neglect may culminate in negative beliefs about the self, others and the world. These beliefs can lead to viewing the self as vulnerable, and the perception that ordinary events are threatening, resulting in psychotic symptoms such as, paranoia and distorted perceptions of regular stimuli (Kelleher et al., 2013). Eye Movement Desensitization and Reprocessing (EMDR) is an effective treatment for trauma (Shapiro, 1995, 2018), which aims to desensitize discomfort caused by traumatic experiences and reprocess them within the individual's autobiographical memory which can achieve symptom relief (Hardy, 2017; van der Vleugel, van den Berg, & Staring, 2012). Increasing evidence acknowledging the relationship between trauma and psychosis indicates that EMDR could be a vital addition to the treatment of psychosis (Sin & Spain, 2017; Valiente-Gomez et al., 2017).

Antipsychotic medication is regarded as the cornerstone of treatment for psychosis (Jones et al., 2006). However, it is reported that around 50% of people being treated with antipsychotic medication continue to experience distressing psychotic symptoms (Pankey & Hayes, 2003); and non-adherence to antipsychotic medication owing to intolerable side effects and poor efficacy contributes significantly to relapse and readmission for people

with a psychotic disorder (Haywood et al., 1995). Adding psychological therapies such as Cognitive Behavioural Therapy (CBT), alongside antipsychotic medication is now common practice, and their addition has demonstrated their potential as an effective treatment for psychosis (Hazell, Haywood, Cavanagh, & Strauss, 2016; Lutgens, Garipey, & Malla, 2017). Although CBT appears to be beneficial there is limited evidence regarding its clinical significance over treatment as usual for preventing relapse for people with psychosis (Jauhar et al., 2014; Morrison et al., 2018). There is room for future research into the treatment of the trauma experiences for people with psychosis, such as EMDR, that could be used as an alternative, or adjunctive, to current treatments.

Recent systematic reviews evaluating a range of trauma-focussed therapies (TFTs) in people with psychosis provide preliminary support for the usefulness and safety of TFTs for the treatment of trauma-associated symptoms of psychosis, and promising effects for the positive symptoms of psychosis (Brand & McEnery, 2018; Swan, Keen, Reynolds, & Onwumere, 2017; Sin & Spain, 2017; Valiente-Gomez et al., 2017). Current literature also suggests that adding TFTs to treatment for people with a psychotic disorder and comorbid PTSD can generate better quality of life, and reduce costs from shorter hospital admissions than the current standard treatment for psychosis (de Bont et al., 2019). Therefore, the aim of this systematic review was to evaluate the safety, effectiveness, and acceptability of EMDR as a treatment for people with psychosis.

2. Methods

2.1. Protocol and registration

This review followed the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) guidelines (Moher, Liberati, Tetzlaff, & Altman, 2009), and the protocol was registered with PROSPERO (CRD42018106756).

2.2. Literature search

Four databases were searched from their year of inception to July 2018: Cochrane, EMBASE via OvidSP, MEDLINE via OvidSP, PsychINFO via OvidSP. Grey literature was searched using the Francine Shapiro Library (FSL), and other Grey literature sites (OpenGrey, www.who.int/trialsearch and www.clinicaltrials.gov) were searched for any unpublished studies, dissertations, or theses to minimize publication bias (Higgins & Green, 2011). The FSL is a collection of scholarly articles, conference presentations, and other relevant writings relating to EMDR. The final search strategies were developed using key terms: (Eye Movement Desensitization and Reprocessing OR EMDR) AND (Psycho* OR Schizo* OR Delusion* OR Hallucination*). The full search strategy used for MEDLINE can be seen in the supplementary material (Table S1). The FSL does not allow for the use of truncation symbols or multi-term searching, and so all key terms were searched separately. This topic is in its infancy as individuals with psychotic disorders are almost always excluded from studies involving effective trauma treatments, due to fear of exacerbating their symptoms (Ronconi, Shiner, & Watts, 2014). Therefore, no date limits were applied in order to yield a sufficient number of results.

Reference lists of relevant retrieved papers were screened for additional studies, along with reference lists within the book 'EMDR Therapy for Schizophrenia and other Psychoses' by Miller (2016). After the searches were complete a new follow-up paper from one of the included studies was published and included in the results (van den Berg et al., 2018).

2.3. Inclusion criteria

The final selection of papers was based on the following inclusion criteria:

- Participants of any age and diagnosed with a psychotic disorder; or mental health disorder where psychotic features were present and measured.
- Studies using a recognized EMDR protocol.
- Studies using EMDR alone, or in combination with treatment as usual (TAU).
- Studies reporting the effect of EMDR on psychotic symptoms.
- Studies written in English language at full text.
- Studies conducted using any research design including qualitative, quantitative, and mixed methods methodologies, with or without control groups.

The decision to include a wide range of designs including those often considered less rigorous was based on the need to provide a comprehensive representation of this novel area of emerging evidence.

2.4. Quality assessment

The quality of the studies did not influence the inclusion criteria, but the strengths and weaknesses of the individual studies were drawn upon to inform the discussion. Due to the variance in study designs, three different quality assessment tools to aid this process were required to suit the needs of all the studies included.

The Cochrane 'Risk of Bias assessment tool' was used to determine the methodological quality of the included clinical trials (Higgins & Green, 2011). Case series and case reports were assessed using The Joanna Briggs Institute (JBI) critical appraisal checklists for case series and case reports (Aromataris & Munn, 2017). An overall judgement of the methodological quality was made based on the questions from the checklists that are most important for the specific cases.

If information was not found in included papers it was sought from adjoining publications, or by contacting the primary authors. Judgements of quality were summarized in the results section.

2.5. Data extraction

Data was systematically extracted onto an Excel spreadsheet tailored to the review question. Data extracted included: authors, year of publication, country, study design, study setting, inclusion and exclusion criteria, sample size, method of randomization, description of the intervention, fidelity checks, control/comparator group, outcome measures, length of follow-up, results and any conclusions drawn. Attempts were made to contact primary authors to obtain any missing data. de Bont et al.'s (2016) publication does not report all the necessary information relating to the trial design. Therefore, earlier publications reporting the same study (de Bont et al., 2013a; van den Berg et al., 2015) were referred to for the relevant information. The extracted data was tabulated and examined for heterogeneity.

2.6. Data analysis

A Narrative Synthesis was performed following guidance from Petticrew and Roberts (2008). The studies were described and organized into logical categories based on the study design. The findings were then analysed within the individual categories, and then synthesized across all categories.

3. Results

A total of 487 potentially relevant papers were yielded through searching the four databases (Cochrane, EMBASE, MEDLINE, PsychINFO), and the Francine Shapiro Library. No additional relevant papers were

identified via reference list, or grey literature searching. After duplicates were removed, a total of 424 citation and abstracts were screened simultaneously for relevance. At this stage, 404 records were excluded leaving 20 papers to be screened at full-text for inclusion in the review. Fourteen papers were excluded with reasons detailed in Figure 1, leaving a total of six papers which met the inclusion criteria and were included in the review.

3.1. Quality assessment

3.1.1. Quality of the included clinical trials

The overall quality of the three trials is limited (see Table 1). de Bont et al.'s (2016) Randomized controlled trial (RCT) is of the highest quality. de Bont et al.'s (2016) publication does not report all information relating to the trial design, therefore, earlier publications reporting the same study were referred to for the quality assessment (de Bont et al., 2013a; van den Berg et al., 2015).

Only one trial reported a suitable method of randomization (de Bont et al., 2016), and one was an open trial and did not randomize at all (van den Berg & van der Gaag, 2012). Only de Bont et al. (2016) reported a form of allocation concealment. All studies had small sample sizes with insufficient power for the statistical tests necessary to evaluate the effectiveness of EMDR.

3.1.2. Quality of case series and case report

The overall quality of McGoldrick, Begum, and Brown's (2008) case series and Laugharne, Marshall, Laugharne, and Hassard's (2014) four vignettes was deemed adequate according to the JBI checklist (see Figure S1 in the supplementary material). However, neither reported complete inclusion of all people who were treated, and further selection bias occurred in both as they only reported cases that they believed had benefited from EMDR treatment. Kratzer, Heinz, and Schennach's (2017) case report is of high quality according to the JBI checklist (see Figure S2 in the supplementary material).

3.2. Overview of studies

The six included studies were published between 2008 and 2017 and evaluated EMDR for the psychological treatment of people with psychotic symptoms. Two studies were conducted in the UK (McGoldrick et al., 2008; Laugharne, Marshall, Laugharne, & Hassard, 2014), two in the Netherlands (de Bont et al., 2016; van den Berg & van der Gaag, 2012), and one in Germany (Kratzer et al., 2017) and south Korea (Kim et al., 2010). The study characteristics including the outcomes can be seen in Table 2.

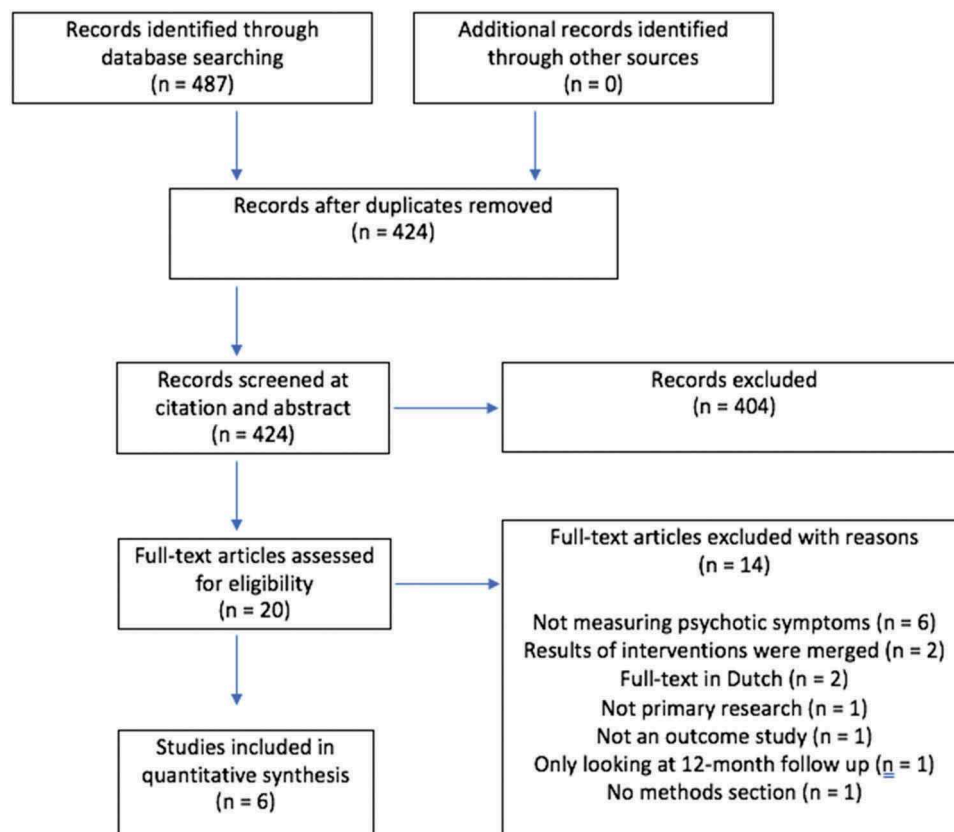


Figure 1. Flowchart.

Table 1. Risk of bias in the included clinical trials.

Study Authors and date	Random Sequence Generation	Allocation Concealment	Blinding of participants and personnel	Blinding of outcome assessment	Incomplete outcome data	Selective reporting	Any other bias
Kim et al. (2010)	Randomization method not reported.	Not reported	Not reported	Outcome assessor was blind to the treatment condition.	Attrition was reported and no significant differences in the rates of drop-outs between the groups in any of the assessment intervals were found.	The study reports all expected outcomes.	1) Self-reported outcome measure. 2) The attending psychiatrist was responsible for the inclusion of participants.
van den Berg and van der Gaag (2012)	Open trial. No randomization	Not reported	Not reported	Not reported	Reasons for attrition were reported and ITT analyses with LOCF (n=27) were undertaken.	The study reports all expected outcomes.	
de Bont et al. (2016)	Participants were randomized using the scientific randomization program on the Internet (www.randomizer.org) by the independent randomization bureau of the Parnassia Psychiatric Institute.	Participants were randomized to each of the three groups using the scientific randomization program on the Internet (www.randomizer.org) by the independent randomization bureau of the Parnassia Psychiatric Institute.	Not reported	Outcome assessors were blind to treatment condition.	Attrition was reported. ITT analyses with the LOCF (n = 155) were undertaken. Missing data was replaced with a negative value.	This study reports all expected outcomes.	1) Self-reported outcome measure.

ITT = Intention-to-treat. LOCF = Last observation carried forward. DRS = Delusion rating scale. GPTS = Green paranoid thought scale.

3.2.1. Study design

The included study designs comprised of an RCT (de Bont et al., 2016); two case series, both including four individual cases (McGoldrick et al., 2008; Laugharne et al., 2014); one single case report (Kratzer et al., 2017) and two pilot studies, one used an RCT design (Kim et al., 2010), and the other was an open trial with only one arm (van den Berg & van der Gaag, 2012).

3.2.2. Sample

A total sample of 236 adult participants were included in this review, with 106 of those participants treated with EMDR and 130 participating within the control or comparator groups. Sample sizes for the trials ranged from 27 to 155. Participants had a range of psychotic disorders across all of the studies including: schizophrenia; schizoaffective disorder; delusional disorders including olfactory reference syndrome (ORS), mood disorders including bipolar disorder with psychotic features, and psychotic disorders otherwise unspecified.

3.2.3. EMDR

Five studies reported using Shapiro's (2001) standard eight-phase EMDR protocol for the treatment of psychotic symptoms. The amount of EMDR sessions varied from one session (McGoldrick et al., 2008 (cases 1 and 4) to 10 sessions (Kratzer et al., 2017). Only two studies reported treatment fidelity checks to ensure EMDR was conducted and administered as intended (de Bont et al., 2016; Kim et al., 2010). Details of the fidelity checks can be seen in the supplementary material (Table S2).

The focus of EMDR differed amongst the studies. In three of the studies EMDR was used to treat Symptoms of PTSD in participants with a psychotic disorder by targeting and reprocessing traumatic life experiences that appeared to have caused the current PTSD (de Bont et al., 2016; Laugharne et al., 2014; van den Berg & van der Gaag, 2012). Kratzer et al.'s (2017) study also evaluated EMDR for the treatment PTSD in a person with a psychotic disorder, however, they also used EMDR to specifically reduce psychotic symptoms by targeting and processing hallucinations associated with the participants dysfunctional beliefs about the self and the world. In one study EMDR was used to treat ORS by targeting the life experiences that triggered the disorder (McGoldrick et al., 2008). In another study EMDR was used to treat the acute phase of schizophrenia and the targets of EMDR were arbitrary and less specific than the other studies (Kim et al., 2010).

3.2.4. Additional treatment

In all of the studies EMDR was provided alongside TAU. For the studies with participants based in the community settings this mainly consisted of psychotropic medications (de Bont et al., 2016; Laugharne

Table 2. Summary of study characteristics and outcomes.

Study authors	Aims	Study design and n	Population	Intervention	Control/Comparator	Outcome	Follow-up
Kim et al. (2010)	To test the feasibility and effectiveness of EMDR for inpatients with a psychotic disorder.	RCT (Pilot study) (n = 45)	Participants diagnosed with Schizophrenia and an inpatient status	Standard eight-phase EMDR protocol (n = 15)	PMR (n = 15) and TAU (n = 15)	Treatment effect sizes for change in total PANSS scores between baseline and 3-months: EMDR – 0.82 PMR – 0.66 TAU – 0.63 No adverse events.	% of people readmitted to hospital at 2-year follow-up EMDR – 18%. PMR – 42%. TAU – 33%.
van den Berg and van der Gaag (2012)	To test the feasibility and effects of EMDR in patients with a psychotic disorder and a comorbid PTSD.	Open pilot trial (n = 27)	Participants diagnosed with Schizophrenia Spectrum Disorder and current PTSD	Standard eight-phase EMDR protocol (Dutch translation)	None	Wilcoxon Signed Rank Tests DRS scores (z = –2.02*) AHRs scores (z = –2.17*) PSYRATS scores (z = –2.67*) GPTS Baseline mean – 73.04. End of treatment mean – 67.92 There were no admissions in general or psychiatric hospital.	None
de Bont et al. (2016)	To examine secondary effects of TFTs of PTSD in patients with chronic psychotic disorders.	RCT (n = 155)	Participants with a Psychotic Disorder and PTSD	Standard eight-phase EMDR protocol (Dutch translation) (n = 55)	Waitlist (n = 47) and PE (n = 53)	GPTS mean scores and 95% CIs EMDR PE WL Baseline 82.7 88.8 83.8 Post-treatment 68* (60.6–75.5) 67.3* (60.1–74.5) 82.7 (74.9–90.6) AHRs mean scores and 95% CIs EMDR PE WL Baseline 24.5 21.7 23.0 Post-treatment 16.8 (11.2–22.3) 18.8 (13.2–24.4) 24.2 (17.8–30.6) % of people in remission from a psychotic disorder Baseline:EMDR – 45.5% PE – 47.2% WL – 40.4%. Post-treatment:EMDR – 56.8%* PE – 59.6%* WL – 30.8%. There was no difference in dropout between the PE 13 participants [24.5%] and EMDR 11 participants [20.0%] (P = .57). The treatments were significantly associated with less adverse events.	GPTS 6-month follow-up WL-70.2 (62.7–77.7) EMDR-65.0 (57.7–72.3) PE-78.3* (70.5–86.2) No change at 12-month follow up (van den Berg et al., 2018) AHRs 6-month follow-up WL-16.1 (10.4–21.7) EMDR-22.5 (16.6–28.4) PE-16.8 (10.6–23.1) No change at 12-month follow up (van den Berg et al., 2018) Remission 6-month Follow-up WL – 45% EMDR – 55.8% PE – 60%
McGoldrick et al. (2008)	To describe four consecutive cases of ORS treated successfully with EMDR.	Case Series (n = 4)	Participants diagnosed with a delusional disorder-somatic subtype	Standard eight-phase EMDR protocol (accept case 1 which used the EMDR protocol described in Shapiro's early papers (Shapiro, 1989a, 1989b))	None	Cases were assessed according to DSM criteria before and after EMDR. Post-treatment: Case 1 – Complete resolution of all symptoms. Case 2 – Resolution of some symptoms. Case 3 – Complete resolution of all symptoms. Case 4 – Complete resolution of all symptom and marked improvement in social functioning.	Case 1 – 6-month follow-up: Symptom free. Discontinued all psychotropic medication. 10- year follow-up: Symptom free and returned to work. Case 2 – 6-month follow-up: Symptom free. Case 3 – 5-year follow-up: Symptom free and discontinued antipsychotic medication. Case 4 – 5-year follow up: Symptom free.

(Continued)

Table 2. (Continued).

Study authors	Aims	Study design and n	Population	Intervention	Control/Comparator	Outcome	Follow-up
Laugharne et al. (2014)	To present four vignettes of people with a psychotic disorder receiving EMDR for symptoms of PTSD	Case series (n = 4)	Participants with an established Psychotic diagnosis who have received EMDR for the treatment of PTSD	Standard eight-phase EMDR protocol	None	Post-treatment: Case 1 – Fewer nightmares. Depression and anxiety much improved. General functioning improved, Case 2 – Marked reduction in distress associated with traumatic memories. Reduction in flash backs and nightmares. Case 3 – reduction in distress associated with images from nightmares. Case 4 – No longer has panic attack and reduced paranoia.	Case 1 – 6-year follow-up: Significant improvement in functioning and reduction in service use. Case 2 – 5-years follow-up: Currently well and only one relapse during the 5 years. Case 3 – 2-year follow-up: Nightmares significantly reduced. Agitation and persecutory thoughts diminished. 3 – year follow-up: Free from drug misuse. Overall functioning improved. Intrusive thoughts remain. One relapse when medication was stopped. Case 4 – 4-year follow-up: Episodes of psychosis no longer included delusions targeted by EMDR. Some psychotic symptoms still remain. Discharged from mental health services.
Kratzer et al. (2017)	No clearly stated aim.	Case report (n = 1)	Participant diagnosed with Schizotypal Personality Disorder and PTSD reporting psychotic symptoms	16 individual 50-min treatment sessions of CBT and ten additional 100-min sessions of EMDR.	None	Post-treatment: PANSS-22 score decreased from 64 to 46 which is clinically significant. Resolution of PTSD and positive psychotic symptoms.	6-month follow-up: symptoms levels decreased even further. Improved functioning. Reduction in service use.

RCT = Randomized Controlled Trial. PTSD = Post-traumatic Stress Disorder. TFT = Trauma-Focused Therapy. ORS = Olfactory Reference Syndrome. n = Sample size. EMDR = Eye Movement Desensitization and Reprocessing. PMR = Progressive Muscle Relaxation. TAU = Treatment as usual. PANSS = Positive and Negative Syndrome Scale. PTSD = Post-traumatic stress disorder. GPTS = Greens Paranoid Thoughts Scale. PSYRATS = Psychotic Symptom Rating Scale. PSYRATS is a measure consisting of two brief structured interviews: the auditory hallucination rating scale (AHRS) and the delusion rating scale (DRS). PE = Prolonged exposure SCI-SR-PANSS = The structured clinical interview for symptoms of remission for the positive and negative syndrome scale. DSM = Diagnostic and Statistical Manual of Mental Health Disorders. CBT = Cognitive behavioural therapy. CI = Confidence intervals. WL = Waitlist. * = significant at $p < 0.05$

NB – Remission status: if no SCI-PANSS symptoms of psychosis interfere with functioning an individual is rated in remission.

et al., 2014; McGoldrick et al., 2008; van den Berg & van der Gaag, 2012). For the studies with participants based in inpatient settings TAU consisted of psychotropic medication, group therapies such as art and exercise therapy, mindfulness and individual psychotherapy (Kratzer et al., 2017; Kim et al., 2010).

3.2.5. Outcome measures

Four studies reported outcomes from structured clinical interviews using Positive and Negative Syndrome Scale (PANSS; Kay, Opler, & Fiszbein, 1986) and/or the Psychotic Symptom Rating Scale (PSYRATS; Haddock, McCarron, Tarrrier, & Faragher, 1999). Two studies used the Greens Paranoid Thoughts Scale (GPTS; Green et al., 2008), which is a self-report measure used to assess the severity of a person's paranoid thoughts.

3.3. Results from clinical trials

All three trials found an association between EMDR and a decrease in psychotic symptoms in different study populations and with different EMDR therapy objectives. Kim et al. (2010) found all treatment groups improved significantly over time on all measures for people in an acute phase of schizophrenia, however, EMDR was not shown to be superior to PMR or TAU at 3-month follow-up. In respect to psychotic symptoms, two trials found opposing results for paranoid thinking according to GPTS scores and auditory hallucinations according to AHRS scores. de Bont et al. (2016) found significant reductions in paranoid thinking, but auditory hallucinations remained unchanged across all groups, when treating PTSD in people with chronic psychotic disorders. Whereas, van den Berg and van der Gaag (2012) found small statistically significant improvements in delusions and auditory hallucinations, but did not produce a significant effect on paranoid ideation, when treating people with psychosis and a comorbid PTSD.

de Bont et al. (2016) were able to demonstrate that EMDR was superior to the waitlist control according to GPTS scores at post-treatment and 6-month follow-up. However, both studies with active comparison groups did not find a significant difference between the treatment groups (de Bont et al., 2016; Kim et al., 2010). Participants in the EMDR and PE groups in de Bont et al.'s (2016) study were significantly associated with more remissions from psychotic disorders than the waitlist condition according to SCI-SR-PANSS scores, however, this was not maintained at 6 or 12-month follow-up for the EMDR group. Despite no significant difference between groups for readmission rates in Kim et al.'s (2010) study, only 18% of participants in the EMDR group had been readmitted to hospital at 2-year follow-up, compared with 42% in the PMR group and 33% in the TAU group.

The average dropout rate for EMDR across all three trials was 17%, and there was no statistical difference between groups for attrition in the two studies using comparison groups (de Bont et al., 2016; Kim et al., 2010). Participants in Kim et al.'s (2010) study did not show any exacerbations of any symptoms due to treatment and no one dropped out due to a worsening of their condition. In van den Berg and van der Gaag's (2012) study, there were three incidences where participants reported brief exacerbation of their symptoms due to the EMDR treatment.

3.4. Results from case series and case report

All cases treated with EMDR in McGoldrick et al.'s (2008) case series reached complete resolution of symptoms of ORS which was maintained at follow-up as long as 10 years (case 1). Kratzer et al.'s (2017) case report found that the use of EMDR in an inpatient setting for people with psychosis and comorbid PTSD produced a clinically significant effect on PANSS- 22 scores, and symptom levels continued to decrease at 6-month follow-up. Across the case series and case report EMDR was associated with other health and well-being benefits including a reduction in psychotropic medication, improved social and general functioning, and a reduction in the use of mental health services.

Initial increases in positive psychotic symptoms were observed in one study (Kratzer et al., 2017). In Laugharne et al.'s (2014) study one person relapsed once during a 5-year follow-up (case 2) and one person relapsed once during a 3-year follow-up after temporarily stopping antipsychotic medication (case 3).

4. Discussion

The use of EMDR was associated with reductions in delusional and negative symptoms of psychosis (de Bont et al., 2016; Kim et al., 2010; Kratzer et al., 2017; Laugharne et al., 2014; McGoldrick et al., 2008; van den Berg & van der Gaag, 2012), and mixed findings were associated with auditory hallucinations and paranoid thinking (de Bont et al., 2016; van den Berg & van der Gaag, 2012). EMDR was associated with more remissions from psychotic disorders than a waitlist condition (de Bont et al., 2016), fewer readmissions to hospital (Kim et al., 2010), and a reduction in the use of mental health services at follow-up as long as 10 years (McGoldrick et al., 2008; Laugharne et al., 2014). This review aimed to evaluate EMDR's potential as a treatment for psychosis. Theoretically, EMDR should be suitable for any mental distress with a traumatic antecedent, which does not need to be of sufficient severity to classify as PTSD (Shapiro, 1995). There is increasing evidence to

suggest that psychosis often occurs in people with a significant history of traumas. Although there is still limited research into the use of EMDR for people with psychosis, early indications suggest that it has potential to be a safe and beneficial intervention for this population (Swan et al., 2017; Sin & Spain, 2017; Valiente-Gomez et al., 2017).

EMDR appears to be a safe intervention for a range of mental health conditions (Carletto et al., 2017; Doering, Ohlmer, de Jongh, Hofmann, & Bisping, 2013; Hase, Schallmayer, & Sack, 2008), and maybe the most poignant finding of this review is that EMDR can also be successfully and safely administered to people with a psychotic disorder with or without a comorbid PTSD. Studies included in this review negate longstanding concerns that treating trauma in people with psychosis will inevitably lead to exacerbations in psychotic symptoms and adverse events (Becker, Zayfert, & Anderson, 2004; Gairns, Alvarez-Jimenez, Hulbert, McGorry, & Bendall, 2015). EMDR did not lead to any adverse events such as suicide attempts, aggression or hospital admissions in any of the included studies. Two of the studies in this review reported that there were no adverse events or exacerbations of symptoms during or after treatment (Kim et al., 2010; Laugharne et al., 2014), and EMDR was associated with significantly less adverse events compared to the wait-list condition in de Bont et al.'s (2016) study. The studies in this review complement the existing literature which suggests TFTs including EMDR are safe to use for people with psychosis, with some studies finding they appear to reduce the adversities experienced by this population compared to wait list conditions (de Bont, van Minnen, & de Jongh, 2013b; van den Berg et al., 2016).

Across the studies EMDR was associated with a statistically and clinically significant decrease in some positive and negative psychotic symptoms, although there were contrasting results for paranoid thinking measured by the GPTS and auditory hallucinations measured by the AHRS (de Bont et al., 2016; van den Berg & van der Gaag, 2012). These differences could be explained by small sample sizes and subsequent lack of power leading to skewed results (Teare et al., 2014). Another plausible contributing factor for the inconsistency in paranoid symptoms could be the use of self-report measures such as the GPTS. These measures are inevitably prone to response bias in which participants can consciously or unconsciously affect outcomes leading to distorted results (Abernethy, 2015).

Sample size and a lack of power is problematic throughout the included trials preventing smaller outcome differences from being detected, potentially affecting the outcomes for EMDR (Sabo & Boone, 2013). Kim et al.'s (2010) study demonstrates that EMDR was associated with considerably fewer readmissions to hospital (18%) at 2-year

follow-up, in comparison to 42% for the attention-placebo group and 33% for the TAU group. Despite these percentages being largely in favour of EMDR, the results were not regarded as statistically significant. Both trials using active comparators were unable to demonstrate that EMDR was superior despite Kim et al.'s (2010) study showing a larger effect size for negative symptoms than the PMR and TAU groups.

Results of the studies with longer follow-up periods (McGoldrick et al., 2008; Kim et al., 2010) provide preliminary evidence that EMDR could potentially provide sustained recovery preventing relapse and readmissions for people with psychosis. The case series in this review with longer follow-up provide valuable insight into the wider impacts on EMDR on a person's life beyond symptom change that contribute to recovery. Both case series note a marked improvement in functioning in most cases with some people returning to full-time employment (McGoldrick et al., 2008; Laugharne et al., 2014). They also report a reduction in the use of psychiatric medication and mental health service use. Reducing the use of psychiatric medication could significantly improve the health, functioning, quality of life and mortality rates of people with psychosis, whereas reduction in the use of services could generate considerable cost savings for the NHS (de Lusignan, Chan, Parry, Dent-Brown, & Kendrick, 2012). These findings should prompt more rigorous confirmatory trials to include outcome measures beyond symptom change with adequate follow-up periods, as decreased service use, economic impact, and improved functioning are also indicators of an intervention's success.

The acceptability of an intervention is a necessary criterion for its overall effectiveness, and is often determined by dropout rates (Sekhon, Cartwright, & Francis, 2017). The average dropout rate across the three trials was 17% (de Bont et al., 2016; Kim et al., 2010; van den Berg & van der Gaag, 2012). This mirrors a previous meta-analysis that found an average dropout rate of 18% for trauma-focused interventions for the treatment of PTSD (Imel, Laska, Jakupcak, & Simpson, 2013). Interpreting the number of dropouts as an indicator of acceptability may be misleading, as someone may think the intervention is entirely acceptable and terminated treatment prematurely simply because their symptoms resolved; or for unrelated reasons such as getting a new job making it difficult to get to appointments (Sekhon et al., 2017). Future research using large, adequately powered, and rigorously performed RCTs with substantial follow-up, which incorporate qualitative methods to capture service user experiences would contribute to this conversation.

4.1. Strengths and limitations of the review

This is the first systematic review of the evidence of EMDR as a treatment for psychosis. It is important to

note that the populations and focus of EMDR varied amongst the studies. Four of the studies were focussed on evaluating the safety of using EMDR when treating PTSD in people with a psychotic disorder (de Bont et al., 2016; Kratzer et al., 2017; Laugharne et al., 2014; van den Berg & van der Gaag, 2012). For these studies, it is difficult to tell whether EMDR was directly responsible for the reduction in psychotic symptoms, or whether it was the reduction in PTSD symptoms that caused subsequent reductions in psychotic symptoms. The two studies evaluating EMDR for the treatment of people with psychosis without a comorbid PTSD were able provide preliminary findings that EMDR could be a useful treatment for psychosis, but these studies are of lower quality (McGoldrick et al., 2008; Kim et al., 2010).

Similar to Swan et al.'s (2017) systematic review of psychological interventions for post-traumatic stress symptoms in psychosis, a strength of this review is the broad search strategy facilitating the inclusion of a variety of study designs. A broad search strategy ensured that no potentially relevant studies were missed, and an inclusive review was produced incorporating all relevant findings within the current literature irrespective of study design. However, although its main strength, the broad inclusion criteria yielded studies which overall are considered poor quality for evaluating the effectiveness of an intervention. Three studies were descriptive studies without a control group and two were pilot studies. Therefore, this review was unable to produce strong inferences regarding the effectiveness of EMDR for people with psychosis.

4.2. Conclusion

This systematic review adds to the growing body of evidence that supports the use of trauma-focused interventions for individuals experiencing psychosis (Swan et al., 2017; Sin & Spain, 2017; Valiente-Gomez et al., 2017). Despite exciting results highlighting the potential benefits of EMDR for the treatment of psychosis, the lack of definitive, high-powered RCTs found, limits any conclusions on the overall effectiveness. However, this review found that EMDR did not lead to any adverse events, and appears a safe and feasible intervention for people both in a stable and acute phase of psychosis, with or without a comorbid PTSD. This review also found comparable dropout rates to existing research evaluating trauma-focused interventions for individuals with PTSD, indicating this population is no more likely to terminate EMDR prematurely than others. However, an adequate evaluation of the acceptability of EMDR for people with psychosis was not possible, as the studies included did not adequately address this issue.

4.3. Implications for practice

This review provides evidence that EMDR can be safely and successfully applied to this people with

psychosis, with evidence of some beneficial effects. Therefore, in practice EMDR could be considered an appropriate treatment for people with psychosis who have been exposed to trauma, based on their individual assessments and clinical needs. It is important to note that some of the studies in this review observed initial increases in psychotic symptoms (Kratzer et al., 2017; van den Berg & van der Gaag, 2012). Although some studies have found that EMDR can be used effectively with this population without the use of additional stabilizing interventions (Hardy & van den Berg, 2016; van den Berg et al., 2015, 2016), initial increases in symptoms highlight the need to view EMDR as a protocol rather than just bilateral stimulation, as there must be sufficient preparation and work on emotional stability before moving on to bilateral stimulation. This also indicates the need for a multidisciplinary team to support people whilst undergoing EMDR in community settings. Due to the initial increase in psychotic symptoms observed in Kratzer et al.'s (2017) study, they suggest administering EMDR in an inpatient setting may be beneficial, as there would be more support available if the intervention increases distress that cannot be adequately managed in the community.

4.4. Implications for future research

The studies in this review have opened up new areas for learning and generated hypotheses that more rigorous trials can evaluate. Larger confirmatory RCTs directly comparing EMDR with 'gold standard' treatments, such as CBT or antipsychotic medication, are required to form more robust conclusions regarding the efficacy of EMDR for the treatment of psychosis. Future trials should ensure they are methodologically sound and sufficiently powered to detect smaller outcome differences, and include outcome measures at follow-up targeting any increase or decrease in mental health services and psychotropic medications. All future research should measure acceptability and rigorously record any adverse outcomes (Duggan, Parry, McMurrin, Davidson, & Dennis, 2014). Future research should also include stringent fidelity checks preferably using the EMDR Fidelity Rating Scale (EFRS) (Korn, Maxfield, Smyth, & Stickgold, 2017). Adherence to treatment protocols confirmed by fidelity rating scales is considered essential for any rigorous RCT (Korn et al., 2017), and fidelity to the treatment model is crucial to success when translating evidence-based interventions into practice (Breitenstein et al., 2010).

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