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Interpersonal Functioning in Psychosis:

An Empirical Study and Systematic Review

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Doctorate in Clinical Psychology

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Thesis Portfolio Abstract

Purpose

The systematic review aimed to identify, synthesise and evaluate the state of evidence regarding quality of social relationships and interpersonal patterns experienced by people with early psychosis, including those with at risk mental states (ARMS). The research study aimed to explore relationships between experiences of trauma and neglect, ability to mentalise and interpersonal problems in people with psychosis.

Method

The review article included a systematic search of four electronic databases, the search revealed eighteen articles. The research study involved gathering data via questionnaires, a semi-structured interview and a cartoon-based task from 48 participants with experience of psychosis. These outcome measures assessed childhood adversity, trauma related distress, ability to mentalise, interpersonal problems and psychotic symptomatology.

Results

The review revealed that people in the early stages of psychosis and those with ARMS experience poor quality relationships and have difficulties with relating to others, such as struggling to prioritise and assert their own needs. These difficulties appear early in the disorder and there was some evidence to suggest they may be related to distress. Further research is required to establish the predictors and consequences of these difficulties. The research article found that participants experienced high levels of trauma related distress and poor mentalising ability. Experience of childhood trauma and neglect was found to influence interpersonal problems via emotional distress and trauma related distress. Trauma related distress was also found to mediate the relationship between childhood adversity and negative symptoms. Mentalising was found to be unrelated to trauma and interpersonal problems.

Conclusions

Taken together the above findings indicate that people with psychosis experience relational difficulties. These difficulties appear to occur early in the disorder and potentially prior to onset. Difficulties in relationships appear to be influenced by experience of trauma, trauma related distress and emotional distress, indicating that a person's adaptation to trauma is significant. Distress (e.g. depression, emotional distress, trauma symptoms) appears to be related to relational functioning. Results reflect that some people may cope with the aftermath of trauma by 'deactivating' and numbing emotional experiences, as trauma was found to indirectly affect negative symptoms via trauma related distress. Findings regarding mentalising appear inconsistent and potentially measures of mentalising require review and refinement.

Lay Summary

This research portfolio is made up of two papers. Both articles relate to people with psychosis. According to the British Psychological Society 'psychosis' can include hearing voices, having unusual sensory experiences, feeling paranoid, believing and/or seeing things that other people typically do not, appearing out of touch with reality and talking in a manner which others may find difficult to understand. These experiences are referred to as 'hallucinations', 'delusions', 'thought disorder', 'acute psychosis' and 'flight of ideas'. They are known as 'positive symptoms' as they are 'added on' to a person's experience. 'Negative symptoms' are 'taken away' from a person's experience and can include low mood, apathy, lack of speech and lack of movement.

The first paper is a review of previous research studies. This review looked to summarise past research regarding how people, who are at risk of developing psychosis and in the early stages of psychosis, relate to other people. This review specifically examined the quality of social relationships i.e. if relationships were perceived to have more positive or negative qualities. The review also looked at how people relate to others; the patterns people can find themselves in when interacting with others. The results of this review found that relationships were strained and in general of poor quality. People also struggled to prioritise and assert their own needs in relationships. Findings suggest that these difficulties occur during the early stages of psychosis and potentially before onset. More research is needed to explore what factors may contribute to these difficulties and what the potential impact of these problems are.

The second paper is a research study. Each person who took part in the study had experienced psychosis at some point in their life. Forty-eight participants completed self-report questionnaires, a semi-structured interview and a picture story task.

The study found that experiencing childhood abuse and neglect influenced levels of distress, difficulties interacting with other people and the negative symptoms of psychosis. The study also found people with psychosis had difficulty with mentalising. Mentalising is the ability to think about one's own mind and another's as distinct, it helps us to predict and understand thoughts, feeling and behaviours. Results also suggested that people in the study experienced high levels of post trauma related distress. People in the study struggled with being self-sacrificing, under-assertive and tended to avoid contact with other people. Experience of childhood abuse and neglect was not found to influence ability to mentalise. Ability to mentalise was found to be unrelated to interacting with other people. Some of these findings appear to be the first of their kind and more research is suggested to replicate these findings.

The Quality of Interpersonal Relationships and Patterns of Interpersonal Functioning in Early Psychosis: A Systematic Review

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(Word count: 6258)

Notes. This systematic review was written up in line with formatting guidelines for submission to 'Psychology and Psychotherapy: Theory, Research and Practice'. Please find author guidelines for the journal in Appendix A. Formatting is in accordance with journal guidelines with the exception of areas the University stipulate (e.g. tables in text, margins, font).

Abstract (Word count=195)

Purpose

To systematically identify, synthesise and evaluate the state of evidence regarding quality of social relationships and interpersonal patterns experienced by people with early psychosis, including those with at risk mental states (ARMS).

Methods

A computerised electronic search was conducted of the following databases via OVID; PsychINFO, Embase, MEDLINE and Cochrane.

Results

Eighteen articles met inclusion criteria, these included 1029 participants. Despite methodological flaws and issues of heterogeneity, the quality of relationships was poor and interpersonal difficulties were apparent in people with early psychosis and ARMS. These problems appear early in the course of the disorder and some evidence suggests they are related to distress and general functioning. Participants appeared to struggle with self-assertion and self-prioritisation.

Conclusions

Relational functioning appears to be a significant difficulty for this population. Clinicians may wish to assess and address difficulties with interpersonal relatedness alongside potential distress, in both people who do and do not convert to psychosis. There was limited evidence in regards to potential underlying mechanisms and consequences of interpersonal functioning in this group, future research may seek to uncover these. Future researchers may aim to pilot treatments targeting the specific difficulties this group experiences with interpersonal functioning.

Key words: psychosis, social relationships, interpersonal, ARMS, relational

Practitioner points

- Interpersonal functioning and quality of social relationships appears to be poor in people with ARMS and early psychosis, these difficulties appear early in the disorder. Specifically, this population appears to struggle with prioritising and asserting their own needs in relationships. Moreover, social relationships were associated with strain and were often experienced as unsupportive and unsatisfactory.
- Clinicians may wish to assess, formulate and address the interpersonal difficulties of their clients. It may be helpful to consider how these specific difficulties (i.e. submissive patterns of behaviour and relationships that are experienced as unsupportive) relate to engagement with health services, health workers and psychological interventions.
- Those with ARMS may continue to have difficulties with relating to others and their needs should be considered and addressed, whether or not they later develop psychosis.
- Clinicians may wish to consider potential distress that may be related to interpersonal difficulties as well as the impact on general functioning.

Introduction

The quality of social relationships has been linked to a variety of important outcomes, including increased mortality (Holt-Lunstad, Smith & Layton, 2010) and poor physical and mental health (Ertel, Glymour & Berkman, 2009; Kawachi & Berkman, 2001; Santini, Koyanagi, Tyrovolas, Mason & Haro, 2015). The ability to manage stress and develop adequate self-esteem has been related to social relationship quality (Brugha, 2010). 'Stress buffering models' suggest that social relationships help individuals cope with stress and increase resilience, by providing a source of emotional support, reciprocity and self-esteem (Cohen & Wills, 1985; Fujisawa, Hamano & Takegawa, 2009). Quality of relationships has been indicated as a more significant and meaningful predictor of health outcomes in comparison to quantity of relationships (Fiorillo & Sabatini, 2011).

Difficulties in social relationships have been linked to several clinical populations, for example, the social and emotional support reaped from relationships is thought to protect against depression in people who have experienced childhood adversity (Brinker & Cheruvu, 2017). Disrupted social relationships have also been reported in psychotic samples (Becker *et al.,* 1997). High levels of difficulty relating to others have been found across the life course of the disorder (Penn *et al*., 2004) and research suggests people with psychosis have small networks (Goldberg, Rollins & Lehman, 2003; Palumbo, Volpe, Matanov, Priebe & Giacco, 2015). A systematic review reported that the quantity of social relationships and social contacts in early psychosis is low compared to healthy controls (Gayer-Anderson & Morgan, 2013), however, quality of relationships appears to be more closely interlinked with health outcomes (Fiorillo & Sabatini, 2011).

Difficulties with interpersonal functioning are thought to be not merely a consequence of psychotic disorder, but a problem prior to onset (Jang *et al*., 2011; MacBeth *et al*., 2014;). Furthermore, poor relational functioning has

been posited as a risk factor for developing psychosis and predicting the course of the disorder (Read, van Os, Morrison & Ross, 2005). People with early psychosis have been found to experience a multitude of social difficulties. Those with at risk mental states (ARMS) for psychosis are thought to experience impaired social cognition (Fusar-Poli *et al*., 2012; Lee *et al*., 2015). Additionally, high levels of loneliness have been reported in those with first episode psychosis (FEP; Angell & Test, 2002). Following onset, high levels of poorly perceived social support are reported (Sunderman, Onwumere, Kane, Morgan & Kuipers, 2014), alongside passivity and isolation (Moller & Husby, 2003). Those with ARMS are thought to have more interpersonal interactions online than in person (Mittal, Tessner & Walker, 2007). Furthermore, people with psychosis are over-represented with regards to social exclusion and disadvantage, as well as high levels of education drop out (Marwaha & Johnson, 2004; Meltzer *et al*., 2002).

Several factors have been linked to the development of difficulties with interpersonal functioning in psychosis, including attachment relationships and interpersonal trauma (Berry, Barrowclough & Wearden, 2008; Stain *et al*., 2014). Correlates of poor interpersonal and social functioning are thought to be widespread and include: increased psychotic symptoms (Collip *et al*., 2013), poor clinical outcomes (Addington & Addington, 2005), poor quality of life (Domínguez-Martínez, Kwapil & Barrantes-Vidal, 2015), poor general functioning (Pruessner, Iyer, Faridi, Joober & Malla, 2011) and increased hospitalisations (Norman *et al*., 2005).

Less is known about the quality of relationships and the pattern of difficulties that this group experience when relating to others. As mentioned previously quality of relationships is important as it is thought to relate to crucial health and psychosocial outcomes. Specifically, it is important to determine the state of relational functioning in early psychosis, as this stage is thought to be a critical period for intervention. Intervention during this time can subsequently

shape and predict the course of the disorder (McGorry, 2011). Systematically reviewing this literature may allow for care to be informed by, and developed to target, the specific interpersonal needs of this group.

Aims of the study

This review aimed to examine relationship quality and patterns of interpersonal functioning in people with ARMS and early psychosis. Specifically, this review sought to address the following research questions:

i) What is the current state of evidence regarding quality of interpersonal relationships and interpersonal patterns in ARMS and early psychosis?

ii) What is the evidence for the association of quality of relationships and interpersonal patterns with other important outcomes in ARMS and early psychosis?

Definitions and terminology

The term 'ARMS' has been used to encapsulate people deemed to be at risk of developing psychosis, according to predefined criteria (e.g. the structured interview for prodromal symptoms (SIPS; Miller *et al.*, 2003); the comprehensive assessment of at-risk mental states (CAARMS; *Yung et al.*, 2005). The ARMS criteria includes the following; attenuated positive symptoms, brief limited intermittent psychotic symptoms and trait vulnerability alongside a significant decline in psychosocial functioning. The ARMS includes people in the 'prodromal phase' or deemed to be 'clinical high risk'. The term 'early psychosis' has been used to capture people in the early stages of the disorder. This includes those with first episode and up to five years following a first episode, including those being seen by early intervention services (McGorry, Killackey & Yung, 2008).

‘Interpersonal functioning’ and ‘interpersonal patterns’ reflect patterns of relating and behaving, including problems that people experience across relationships. For example, increased sensitivity and stress when relating to others and/or relating to others in ways which may result in interpersonal needs being unmet (e.g. domineering, under-assertive, self-sacrificing). ‘Quality of relationships’ refers to positive and negative aspects of relationships, such as support and strain. This may also include perceived satisfaction, reciprocity, companionship and exclusion. The term ‘relational functioning’ has been used to denote both quality of relationships and interpersonal patterns.

Methods

The protocol for this systematic review was registered on PROSPERO (CRD 42018103694) to increase transparency and reduce risk of bias. The review followed PRISMA guidelines (Preferred Reporting Items for Systematic Reviews and Meta-Analyses; Moher *et al*., 2015).

Search strategy

Literature searches were carried out on the 16th February 2018. Articles were identified by searching the following online databases via OVID: PsychINFO (1806 to Feb week 2 2018), Embase Classic+Embase (1947 to 2018 February 15); MEDLINE(R) (1946 to present) and Cochrane (all years up to issue 2 of 12, February 2018). Search terms were piloted and refined through preliminary searches, consultation with an expert librarian and the third author (H.G.) who has specialist knowledge of the research area. The following search terms were used: (psychosis OR psychoses OR psychotic OR schizo*) AND (interpersonal OR interpersonal problem OR interpersonal deficit OR interpersonal relationship OR personal relationship OR social relationship OR peer relationship OR family relationship OR romantic relationship). References were exported to an online database, duplicates were automatically removed. References were initially screened via title and abstract, then full-text articles were reviewed. Reference lists of the final papers were hand searched.

Inclusion criteria:

i. Sample included participants with:
    a. Early psychosis (e.g. FEP or individuals under the care of an early intervention service and/or individuals who had been experiencing psychosis for up to five years after a first episode)

    or

    b. ARMS where predefined criteria were used (e.g. the SIPS, CAARMS)

ii. Standardised outcome measure which focused on quality of relationships and/or patterns of interpersonal functioning
iii. Peer reviewed journal articles
iv. Empirical research
v. Where the sample was not 100% early psychosis/ARMS, articles were included if at least 50% were the target population and the article reported interpersonal outcomes separately for this group
vi. Any study design was acceptable, however, only trials which reported baseline data were included

Exclusion criteria:

i. Non-English language articles
ii. Measures which did not focus solely on relationship quality/interpersonal patterns, but focused on the following constructs:
    a. generic social functioning
    b. ward environment/therapeutic relationships
    c. number of contacts/relationships
    d. attachment
    e. social cognition
    f. quality of life

Quality assessment

Articles which fulfilled inclusion/exclusion criteria were quality assessed with regards to methodological quality and risk of bias. A quality assessment tool was required which could cover a variety of study designs and assess the ability of each article to answer the research questions. Currently, there is no consensus on a tool which assesses studies of mixed methodological design (Deeks *et al.*, 2003). Therefore, guidelines from the Agency for Healthcare and Research Quality (AHRQ; Viswanathan *et al.*, 2017) and the National Institute of Health (2018) were used to develop quality criteria (see appendix B).

Quality criteria were piloted on four studies with different designs and subsequently refined. Criteria consisted of 14 items, each item was assigned a mark (2=well covered, 1=adequate, 0=poorly addressed/not addressed). A total percentage was calculated for the number of items that scored 'well covered'. This figure was calculated from items which applied to the particular study design. As intervention studies were few and uncontrolled, they were quality assessed as cross-sectional studies, as the conclusions that could have been drawn would likely have lacked meaning and were not central to the research questions. To increase validity of the quality criteria inter-rater reliability was assessed. A second researcher (a Clinical Psychologist) blind rated 25% of the articles. Articles for blind rating were selected at random. The initial agreement rate was 86%, each discrepancy was one mark apart. Discrepancies were resolved through discussion which resulted in 100% agreement.

Data extraction

Data extraction was completed by the first author using a proforma designed to answer the research questions. For intervention studies, data was extracted from baseline only. The extracted data is displayed in table 1 and a narrative synthesis is provided.

Results

Literature search

Details of the literature search and exclusion process are displayed in figure 1.

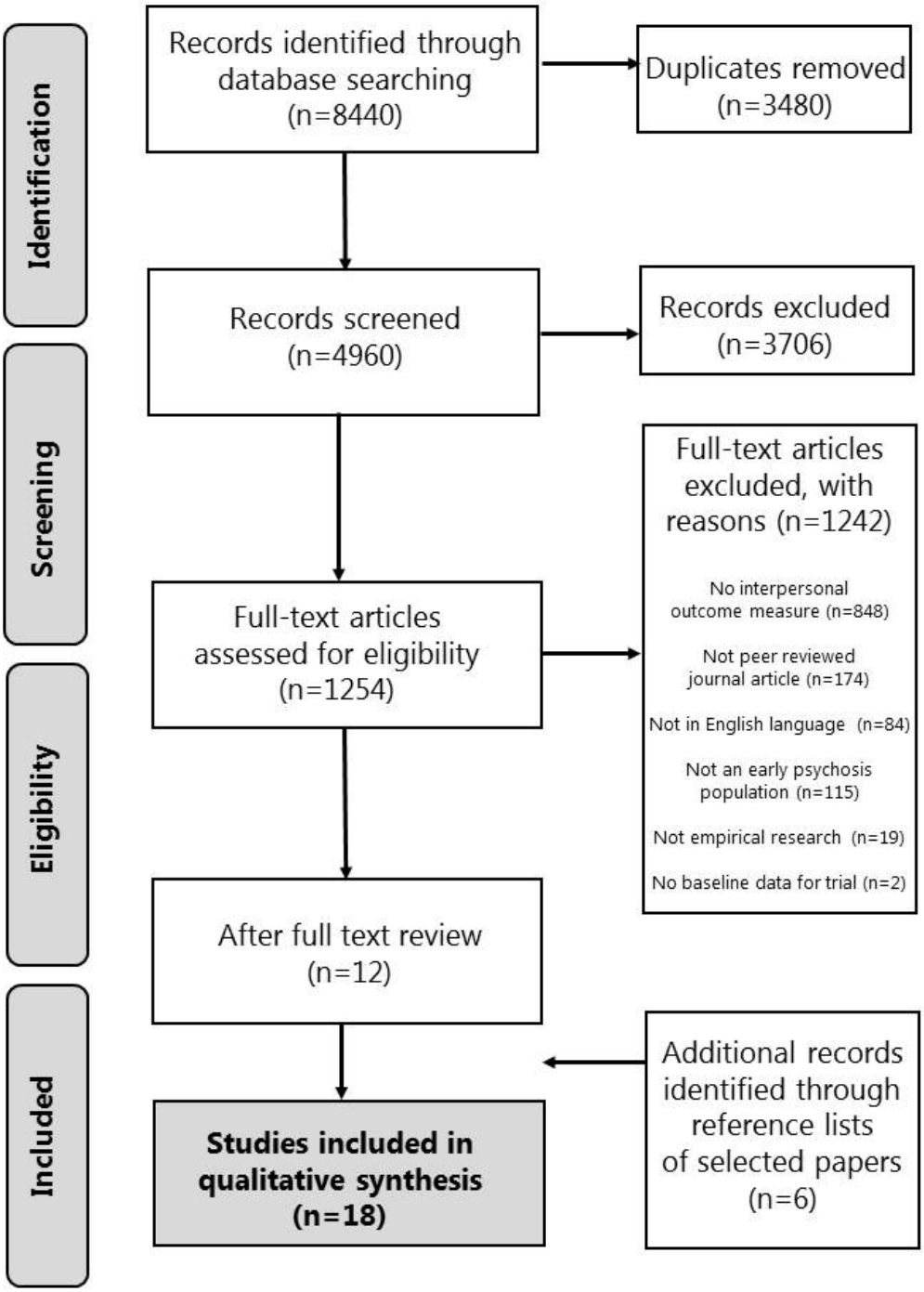

Figure 1: Flow diagram of search and screening process

Included studies

Eighteen articles were identified that fulfilled inclusion/exclusion criteria (these papers consisted of 13 datasets).

Study/participant characteristics

Study/participant characteristics are summarised in table 1. There were 1029 participants, this included 607 participants with ARMS and 422 participants with early psychosis (N=13). The sample was 38.1% female (N=13). The mean age of the sample was 21.0 years (N=11). Mean duration of psychosis was 10.7 months (N=4). Other demographic characteristics were inconsistently reported or were reported in ways which do not allow for amalgamation (e.g. ethnicity, education/employment level). The majority of studies recruited participants from clinical services. However, two studies used a wider recruitment strategy which included participants outwith health services (Masillo *et al*., 2016; Robustelli *et al*., 2017). One article did not report where the sample was recruited from (Mondrup & Rosenbaum, 2010).

Each study used diagnostic criteria to define their sample. Six articles, with early psychosis samples, used the Diagnostic and Statistical Manual of Mental Disorders (DSM) to define their population (DSM-IV; American Psychiatric Association, 2000; Abbass *et al*., 2015, Johansen *et al*., 2013; MacDonald *et al*., 2000; Song *et al*., 2013. DSM-III; American Psychiatric Association, 1980; Erickson *et al*., 1989; Erickson *et al*., 1998). Two articles used the International Classification of Diseases (ICD-10; World Health Organisation, 1992; Allison *et al*., 2013; Na *et al*., 2016). Articles with ARMS samples used the SIPS (Miller *et al*., 2003) criteria (Cannon *et al*., 2008; Cornblatt *et al*., 2012; Fulford *et al*., 2013; Masillo *et al*., 2016; Mondrup & Rosenbaum, 2010; *Niendam et al*., 2007; Robustelli *et al*., 2017; Song *et al*., 2013), scale of prodromal symptoms (Miller *et al*., 1999) criteria (Cornblatt *et al*., 2007) or the comprehensive assessment of at-risk mental states (CAARMS; Yung *et al*., 2005) criteria (Masillo *et al*., 2012; McDonnell *et al*., 2018) to define their samples.

Three articles used specifically FEP samples (Erickson *et al*., 1989; Erickson *et al*., 1998; Song *et al*., 2013). 'Early psychosis' was quantified differently across the studies, in relation to years of psychosis. Two papers specified a maximum time period of less than/equal to five years (Fulford *et al*., 2013; Na *et al*., 2016) whereas one study specified no more than two years (Johansen *et al*., 2013). Three papers did not state duration of early psychosis apriori. Of these, one study reported the sample was recruited from an early intervention service (Abbass *et al*., 2015), one reported mean duration of treatment as 24.4 months (Alison *et al*., 2013) and MacDonald *et al*. (2000) reported mean duration of illness (24.7 months).

Measurement

Across the studies eight standardised outcome measures were used to examine various aspects of relational functioning.

Global Functioning Social Scale (GFSS; Cornblatt *et al*., 2007)

Seven articles used the GFSS (Cannon *et al*., 2008; Cornblatt *et al*., 2007; Cornblatt *et al*., 2012; Fulford *et al*., 2013; Masillo *et al*., 2016; Niendam *et al*., 2007; Song *et al*., 2013). This assessment examines quality of peer relationships, conflict, age appropriate intimate relationships and family relationships. This assessment is rater scored on a scale of 1-10 with higher scores indicating better functioning. The measure considers age appropriateness, social withdrawal and isolation. Both construct (Cannon *et al*., 2008) and predictive validity (Cornblatt *et al*., 2007) have been reported.

The Interpersonal Sensitivity Measure (IPSM; Boyce & Parker, 1989)

Four articles used the IPSM (Masillo *et al*., 2012; Masillo *et al*., 2016; McDonnell *et al*., 2018; Na *et al*., 2016). This 36 item self-report questionnaire assesses excessive sensitivity to interpersonal behaviour and social feedback from others. Higher scores indicate higher levels of interpersonal sensitivity.

Subscales include; interpersonal awareness, need for approval, separation anxiety, timidity and fragile inner self. This measure has good internal consistency, convergent and divergent validity as well as test re-test reliability (Boyce & Parker, 1989).

Inventory of Interpersonal Problems (IIP; Barkham, Hardy & Startup, 1996)

Three articles used the IIP (IIP-32 - Abbass *et al*., 2015; IIP-64 - Johansen *et al*., 2013; Mondrup & Rosenbaum, 2010). This self-report measure assesses interpersonal difficulties that people experience in social relationships. Participants rate items on a four-point Likert scale. Eight subscales can be calculated, these include: social inhibition, non-assertive, overly accommodating, cold, vindictive, self-sacrificing, domineering and needy. A total score can be calculated, higher scores reflect increased problems. This measure has high internal consistency and good face validity (Barkham *et al*., 1996).

Interview Schedule for Social Interaction (ISSI; Henderson, Duncan-Jones, Byrne & Scott, 1980)

Two articles used the ISSI (Erickson *et al*., 1989; Erickson *et al*., 1998). This assessment involves participants discussing their interpersonal relationships for the duration of time leading up to their first interaction with services. This measure assesses supportive people in the network, availability of close and confiding relationships, as well as the level of satisfaction with these relationships. Adequate reliability and validity have been reported in a schizophrenia sample (Bengtsson-Tops, 2004).

Network of Relationships-Revised (Furman & Buhrmester, 1985)

One article used the NRI-R (Allison *et al*., 2013). This 30 item self-report measure assesses positive and negative features of relationships. Positive features include: companionship, disclosure and support. Negative features include: exclusion, power and criticism. Higher scores on each scale indicate

higher levels of positive/negative features. High internal consistency has been reported (Furman & Buhrmester, 1992).

Submissive Behaviour Scale (SBS; Gilbert & Allan, 1994)

One article used the SBS (Allison et al., 2013). This 16-item outcome measure examines how often people engage in submissive behaviours in social relationships. A five-point Likert scale is used. Higher scores indicate higher levels of submissive behaviours. Good internal consistency and reliability have been reported (Allan & Gilbert, 1997; Birchwood, Meaden, Trower, Gilbert & Plaistow, 2000).

Adolescent Social Relationship Scale (MacDonald, Madden & Roods, 1996)

One article used the ASRS (MacDonald *et al*., 2000). This measure is adapted from the Social Relationship Scale (McFarlane, Neale, Norman, Roy, & Streiner, 1981). This measure assesses who is able to support participants and to what extent they find these interactions helpful. Relational reciprocity is also captured. The Social Relationship Scale has reasonable reliability and validity (McFarlane *et al*., 1981).

Support and Strain Scales (Walen & Lachman, 2000)

One article used the support and strain scales (Robustelli *et al*., 2017). This measure assesses quality of relationships including both positive and negative facets. Higher scores indicate higher levels of support/strain on each scale. Good internal consistency has been reported (Walen & Lachman, 2000).

Table 1: Summary of data extraction and participant characteristics

Study	Overall quality rating	Design (follow up period)	N and population (ARMS criteria)	Age M (SD)	% female	Control group	Relationship measure	Other outcome measures	Key results
Abbass *et al.*, 2015 Canada	54.5%	Single, open arm pilot trial	38 early psychosis	-	47.4	-	IIP-32	-	Mean (SD) for IIP-32 (higher scores indicate more problems); Socially inhibited = 2.06 (1.2) Non-assertive = 1.92 (1.2) Overly accommodating = 1.76 (1.1) Cold/distant = 1.72 (1.2) Vindictive = 1.43 (1.0) Self-sacrificing = 1.09 (0.8) Domineering controlling = 0.90(0.8) Intrusive/needy = 0.84 (0.8) Total score = 1.48 (0.7)
Allison *et al.*, 2013 UK	58.3%	Case control	24 early psychosis	23 (3.71)	25.0	24 matched normal controls	NRI-R, SBS	PANSS	Psychosis sample significantly less satisfied (t=2.67**) with friends and felt significantly more excluded by peers (t= 2.61**). Psychosis sample engaged significantly more in submissive behaviours (t=2.18*). Significant relationship between positive symptoms and submissive behaviour (r=.43*).
Cannon *et al.*, 2008[c] USA	46.2%	Cohort (2.5 year)	291 ARMS (SIPS)	18.1 (4.6)	41.6	-	GFSS	SIPS	Poorer quality of relationships associated with conversion to psychosis (χ^2=14.98**).
Cornblatt *et al.*, 2007[c]	57.1%	Cohort (6 & 12 months)	121 ARMS (SOPS)	16.5	34.7	44 normal controls	GFSS	GFRS, SOPS, GAF, SCOS, PAS	Quality of relationships poorer for prodromal than non-prodromal group (F=204.05**). Relationship functioning more stable compared to role functioning, over a year period. Quality of relationships correlated with number of social contacts (r=.70**),

									premorbid social adjustment (r=-.49**), negative symptoms (r=-.54**), general functioning (r=.44**), role functioning (r=.31**) and conversion to psychosis (t=3.21**).
Cornblatt *et al*., 2012[c] USA	38.5%	Case control (2.5 years)	50 ARMS (SIPS) & 50 psychosis	18.0 18.2	36.0	-	GFSS	SIPS, GFSR	Poorer quality of relationships at baseline associated with conversion to psychosis (t=3.21**), including when baseline cognition was adjusted for. Onset of psychosis did not further disrupt social difficulties. Relational functioning was four to five times poorer in those who converted to psychosis than matched non-converters (OR, 3.82; 95% CI, 1.08–13.51 and OR, 5.83; 95% CI, 1.15–29.54). No relationship between baseline positive or negative symptoms, depression, or emergence of psychosis and quality of relationships. Quality of relationships at baseline did not differ between STC and LOC.
Erickson *et al*., 1989[a] Canada	28.6%	Case control (18 months)	146 FEP Split into affective and non-affective	25.2 (8.1)	33.0	122 matched normal controls	ISSI	DSM-III axis V rating	Non-affective FEP perceive less close and confiding relationships than normal controls(p<.01). Perceived increased numbers of friendships of good quality positively related to outcome for FEP (non-affective r=.37**; affective r=.38**). No differences between groups regarding perceived availability of acquaintances. Increased numbers of family relationships related to poorer prognosis for non-affective FEP group (r=-.25*). Greater availability (r=.25*) and adequacy (r=.35**) of acquaintances was positively

									associated with outcome for non-affective FEP, but not affective FEP. Social relationships had a more significant role for non-affective FEP group than affective FEP group.
Erickson *et al.*, 1998[a] Canada	46.2%	Case series (18 months, 5 years)	146 FEP Split into affective and non-affective	25.2 (8.1)	33.0	-	ISSI	DSM-III axis V rating	More supportive friendships predicted adaptive functioning five years after the first treatment contact for non-affective FEP sample (r=.31**). Better five-year adaptive functioning was related to more non-kin social relationships for non-affective group (r=.29**). Greater availability of acquaintances and fewer family in the network did not predict medium-term outcome.
Fulford *et al.*, 2013 USA	58.3%	Cross sectional	98 ARMS (SIPS) 88 early psychosis	17.73 (4.23) 21.28 (3.97)	40.8 28.4	-	GFSS	SCOS, GAF, SIPS, SOPS	Negative (ARMS r=-.38**; early psychosis r=-.42**) and disorganised symptoms (ARMS r=-.31**; early psychosis r=-.18**) significantly associated with quality of relationships. Link between positive symptoms and quality of relationships in early psychosis (r=-.20*). In the ARMS sample disorganised and positive symptoms were not associated with relationships after negative symptoms were controlled for. Depression and quality of relationships were associated in the ARMS sample, including after controlling for negative and demographic symptoms (β=-.16*). Anxiety and quality of relationships were not associated. Quality of relationships was associated with general functioning (ARMS r=.37**; early psychosis r=.57**) and number of social contacts (ARMS r=.59*; early psychosis

									r=.60**) and employment (ARMS/early psychosis r=.24**).
Johansen *et al*., 2013 Norway	45.4%	Cross sectional	42 early psychosis	27.5 (5.6)	33.3	-	IIP-64	PANSS, NEO-FFI, WAI-S	Interpersonal problems significantly higher (>1 SD) on all dimensions (except domineering) in comparison to norm sample, but similar level to non-psychotic clinical sample. Comparatively, less problems were experienced on the dominant/hostile quadrant (dominant/friendly t=2.76**; submissive/hostile t=4.33**; submissive/friendly t = 5.48**) and more problems were experienced on the submissive/friendly quadrant (submissive/hostile t=–2.05*; dominant/friendly t=–3.84**; dominant/ hostile t=–7.24**). Submissive/hostile problems were related to patient rated working alliance (r=-.46**), tasks (r=-.34*), goals (r=-.41**) and bond (-.46**). Working alliance patient rated goals were associated with dominant/hostile interpersonal problems (r=-.44**). Personality traits were associated with interpersonal problems; neuroticism and dominant/hostile (r=.61**), submissive/hostile (r=.73**), submissive/friendly (r=.62**) and dominant friendly (r=.561**). Extraversion was related to submissive hostile interpersonal problems (r=-.50**). Agreeableness was related to dominant hostile (r=-.52**) and submissive hostile interpersonal problems (r=-.51**). Conscientiousness was associated with dominant hostile (r=-.37**), submissive hostile (r=-.42**), submissive

									friendly (r=-.37*) and dominant friendly interpersonal problems (r=-.43**).
MacDonald *et al.*, 2000 Australia	27.3%	Case control	26 early psychosis	-	-	26 matched normal controls	ASRS	-	People with psychosis had smaller networks (t=–2.34*), fewer friendships (t=–3.61**) and poorer quality friendships (i.e. less people to turn to in a crisis; t=–2.34*). No differences were found regarding perceived support, number of family members, acquaintances or reciprocal relationships. Psychosis sample were more likely to identify service providers in their network (χ^2=7.02**).
Masillo *et al.*, 2012[b] UK	75.0%	Case control	62 ARMS (CAARMS)	22.6 (4.05)	40.3	39 normal controls	IPSM	PQ, WCQ, DASS	ARMS experienced increased levels of interpersonal sensitivity overall (U=577.0**), interpersonal awareness (U=592.0**), separation anxiety (U=474.5**) and fragile inner self (U=644.5**). Interpersonal sensitivity was associated with positive symptoms (e.g. paranoid ideation r_s=.52**), avoidant coping (r=.40**), depression (r=.56**), anxiety (r=.60**) and stress (r=.58**). Interpersonal sensitivity and positive symptoms were no longer associated after depression was controlled for.
Masillo *et al.*, 2016 Italy	58.3%	Cross sectional	39 ARMS (SIPS)	17.36 (5.58)	46.2	108 treatment seeking but non-ARMS	IPSM, GFSS	GFRS	ARMS had higher levels of interpersonal sensitivity (U=1430.0, p<.01, r=.25) and poorer quality relationships (U=1279.0, p<.01, r=–.31). Interpersonal sensitivity (specifically interpersonal awareness; r=-.33*) and timidity (r=-.36*) correlated with quality of relationships. This relationship was not mediated by negative symptoms. Interpersonal sensitivity was not related to role functioning.

									Interpersonal sensitivity was related to negative symptoms (β=.48**).
McDonnell *et al*., 2018[b] UK	54.5%	Cross sectional	64 ARMS (CAARMS)	22.5 (4)	40.6	-	IPSM	Retrospective bullying questionnaire, SPSS	Severity of bullying significantly predicted interpersonal sensitivity (β=.33*). Interpersonal sensitivity significantly predicted paranoid ideation (β=.54**). Interpersonal sensitivity carried the effect between severe bullying and state paranoia (β=.18*).
Mondrup & Rosenbaum, 2010 Denmark	33.3%	Cross sectional	11 subthreshold 12 ARMS (SIPS)	23.1 22.6	45.4 66.7	12 Psychosis	IIP-64	SIPS	Severity of interpersonal problems increased with severity of psychotic symptomatology. Significant differences on dominant/controlling between ARMS and psychosis (d=.60**), and subthreshold and psychosis (d=.68**). Significant differences on vindictive/self-centred between subthreshold and psychosis (d=.61**). The entire sample struggled to initiate social interactions, express feelings, use initiative and be the focus of attention. The ARMS sample experienced most problems on the non-assertive, socially inhibited and self-sacrificing subscales. Interpersonal problems in the ARMS sample were increased on all axes except the domineering/controlling dimension (all p<.01).
Na *et al*., 2016 Korea	30.8%	Cohort (1 year)	25 early psychosis	28.16 (6.44)	48.0	-	IPSM	IPSM	IPSM baseline scores M (SD) (higher scores indicate increased problems); Separation anxiety = 19.88 (4.44) Interpersonal awareness = 19.86 (4.93) Need for approval = 19.36 (5.05) Timidity = 19.06 (6.13) Fragile inner-self = 11.36 (3.25)

Niendam *et al*., 2007[c] USA	69.2%	Cohort (mean 8.3 months)	35 ARMS (SIPS)	17.26 (4.32)	40.0	-	GFSS	SOPS, Trail making test A and B, WMS-III	50% of ARMS individuals showed improvement in social functioning over the follow-up period. 37%–43% showed a 20% improvement from baseline. Improved quality of relationships was associated with improvement in processing speed (t=-2.26*), memory (t=-2.56*) and positive symptoms (t=2.43*). Improvement in relationship quality was not associated with participation in psychological therapy.
Robustelli *et al*., 2017 USA	58.3%	Cross sectional	44 ARMS (SIPS)	19.2 (1.73)	41.0	41 normal controls	Support and strain scales	SIPS, SNI, ISEL 12, UCLA loneliness scale	ARMS had more strain (friend strain t=-2.57*; family strain t=4.46**) and less support in relationships (friend support t=4.07**; family support t=4.55**). Higher levels of social anhedonia were associated with less friend support (r=–.40**). Social anhedonia was not associated with family support, or family or friend strain. Family support and positive symptoms were associated (r=-.31*). Friend support and negative symptoms were associated (r=-.39*).
Song *et al*., 2013 Korea	64.3%	Cohort (24 months)	50 ARMS (SIPS) 33 FEP	20.0 (3.4) 21.4 (3.6)	40.0 57.6	120 normal controls	GFSS	TCI, GFRS	Better quality relationships associated with higher cooperativeness in the UHR sample (r=.51**). In the FEP sample better quality relationships was associated with lower harm avoidance (r=-.56**) and higher self-directedness (r=.59*). Baseline relational functioning was not associated with conversion (over 24 months).

Notes. *=p<.05; **=p<.01; [a]=same dataset; [b]=same dataset; [c]=same dataset; M=mean; SD=standard deviation; NRI-R=network of relationships inventory revised; SBS=submissive behaviour scale; PANSS=positive and negative symptoms scale; ARMS=at risk mental states; GFSS=global functioning social scale; SIPS=structured interview for prodromal symptoms; GFRS=global functioning role scale; SOPS=scale of prodromal symptoms; GAF=global assessment of functioning; SCOS=Strauss Carpenter outcome scale; PAS=premorbid adjustment scale; FEP=first episode psychosis; STC=short term converters; LOC=longer onset converters; ISSI=schedule for social interaction; DSM=diagnostic and statistical manual for mental disorders; NEO-FFI=neuroticism-extraversion-openness five-factor inventory; WAI-S=Wechsler adult intelligence scale; ASRS=adolescent social relationship scale; CAARMS=comprehensive assessment of at-risk mental states; IPSM=interpersonal sensitivity measure; PQ=prodromal questionnaire; WCQ=ways of coping questionnaire; DASS=depression anxiety and stress scales; SPSS=state social paranoia scale; WMS-III=Wechsler memory scale; TCI=temperament and character inventory.

Critical appraisal of study quality

Findings from quality assessment are summarised in table 2. Study quality has been considered whilst reporting findings throughout the results section. Overall quality was found to vary across the studies. Five of the 18 included articles appeared to be of poor quality, as their overall quality rating was below 40%. Several areas were less well covered across the studies. These included sample size justification, representativeness of the samples (i.e. majority in health services), high percentage of males (reflecting the usual demographics of this group), unmatched comparison groups and poor levels of follow up data from longitudinal studies. As mentioned previously, studies did not provide detailed information regarding the descriptive characteristics of their sample. This could be improved in future research to allow for comparisons across studies and for representativeness to be more thoroughly assessed.

There were several areas of strength across the studies, including standardised outcome measures with good statistical properties, both for the relationship measure and for other psychological constructs. It should be noted that the inclusion criteria of the review stipulated that the relationship outcome measure had to be standardised.

Asides from diagnostic criteria, the articles were mixed with regards to application of inclusion/exclusion criteria. Two articles did not apply inclusion and exclusion criteria (Abbass *et al.*, 2015; MacDonald *et al.*, 2000). Four articles applied scant inclusion or exclusion criteria (Allison *et al.*, 2013; Masillo *et al.*, 2012; Masillo *et al.*, 2016; Mondrup & Rosenbaum, 2010). It was a strength that twelve articles applied both inclusion and exclusion criteria, which included common exclusions for this population (such as brain injury, alcohol and drug dependence, significant intellectual disability; Cannon *et al.*, 2008; Cornblatt *et al.*, 2007; Cornblatt *et al.*, 2012; Erickson *et al.*, 1998; Erickson *et al.*, 1989; Fulford *et al.*, 2013; Johansen *et al.*, 2013; McDonnell *et al.*, 2018; Na *et al.*, 2016; Niendam *et al.*, 2007; Robustelli *et al.*, 2017; Song *et al.*, 2013).

Studies were well designed in relation to the research questions. No studies received ‘0/poorly addressed’ for these criteria. Furthermore, samples were well defined in relation diagnostic criteria, with every study using diagnostic criteria. However, some heterogeneity was observed in relation to ARMS criteria and the specific duration of early psychosis.

Table 2: Summary of methodological quality assessment

Quality criteria	Abbass *et al.* (2015)	Allison *et al.* (2013)	Cannon *et al.* (2008)	Cornblatt *et al.* (2007)	Cornblatt *et al.* (2012)	Erickson *et al.* (1989)	Erickson *et al.* (1998)	Fulford *et al.* (2013)	Johansen *et al.* (2013)	MacDonald *et al.* (2000)	Masillo *et al.* (2012)	Masillo *et al.* (20	McDonnell *et al.* (2018)	Mondrup & Rosenbaum (2010)	Na *et al.* (2016)	Niendam *et al.* (2007)	Robustelli *et al.* (2017)	Song *et al.* (2013)
Research question	2	2	1	1	2	1	2	2	2	2	2	2	2	2	1	2	2	2
Study design	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2	2	2
Study population	1	1	1	1	1	1	1	1	1	1	2	2	1	1	2	2	2	2
Sample size justification	1	1	2	2	1	1	1	2	1	1	1	1	1	0	0	1	1	1
Recruitment procedure	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1
Sample description	1	2	1	2	1	1	1	1	1	0	1	1	2	1	1	1	1	1
Comparison group	NR	2	NR	0	2	1	NR	1	NR	2	2	1	NR	0 NA	NR	NR	1	2
Relationship measure	2	2	2	2	2	2	2	2	2	1	2	2	2	2	2	2	2	2
Other measures	2	2	2	2	NR	2	2	2	2	NR	2	2	1	2	0	2	2	2
Follow up data	NR	NR	1	0	0	1	0	NR	NR	NR	NR	NR	NR	NR	2	2	NR	2
Follow up period	NR	NR	2	2	1	1	2	NR	NR	NR	NR	NR	NR	NR	1	1	NR	1
Analysis methods	1	1	2	2	2	1	1	2	2	1	2	1	1	1	1	2	1	1
Limitations addressed	2	2	1	2	1	2	2	2	1	1	2	2	2	1	1	2	2	2
Conflicts of interest	2	0 NA	1	0 NA	1	0 NA	0 NA	1	0 NA	1	2	2	2	0	2	2	1	2
Total % 'well covered'	54.5	58.3	46.2	57.1	38.5	28.6	46.2	58.3	45.4	27.3	75.0	58.3	54.5	33.3	30.8	69.2	58.3	64.3

Notes. 2=well covered; 1=adequate; 0=not addressed/poorly addressed; NR=not relevant; NA=not addressed; italics denotes categories which only apply to certain study designs.

Interpersonal functioning and quality of relationships

All studies (of both higher and lower quality) reported difficulties with relating to others, across both ARMS and early psychosis samples, indicating that interpersonal functioning was a difficulty for participants and that quality of relationships was poor.

ARMS and interpersonal functioning

Three studies highlighted that those with ARMS had poor interpersonal functioning. Compared to controls those with ARMS reported higher interpersonal sensitivity overall, as well as difficulties with interpersonal awareness, separation anxiety and a fragile inner self (Masillo *et al*., 2012; Masillo *et al*., 2016). Additionally, interpersonal awareness and timidity was found to negatively correlate with quality of relationships (Masillo *et al*., 2016). Mondrup and Rosenbaum (2010) reported that those with ARMS experienced problems with being under-assertive, socially inhibited and self-sacrificing.

ARMS and quality of relationships

Three studies suggested that quality of relationships was poor in those with ARMS (Cornblatt *et al*., 2007; Masillo *et al*., 2016; Robustelli *et al*., 2017). Specifically, relationships were more likely to feel strained and less supportive, those with ARMS also perceived that they had fewer good quality relationships than healthy controls (Robustelli *et al*., 2017). Higher levels of peer conflict, and poorer quality relationships with family, friends and intimate relationships were observed, compared to treatment seeking non-ARMS controls (Masillo *et al*., 2016). Poor quality relationships were found to correlate with lower levels of social contact and poorer social premorbid adjustment (Cornblatt *et al*., 2007; Fulford *et al*., 2013). Data from one sample suggested that relationship functioning lacked stability over time but reported that it was more stable than role functioning (Cornblatt et al., 2007; Neindam *et al*., 2007).

Early psychosis and interpersonal functioning

Four studies reported difficulties with interpersonal functioning for people with early psychosis, the patterns were similar to those with ARMS. In comparison to matched controls, those with early psychosis were found to engage more frequently in submissive behaviours when relating to others (Allison *et al*., 2013). Similarly, two studies reported that people with early psychosis experienced most interpersonal problems on the submissive, socially inhibited, non-assertive and over-accommodating interpersonal domains (Abbass *et al*., 2015; Johansen *et al*., 2013). Domineering was the only subscale that the early psychosis sample did not experience significantly more problems with, when compared to a normative sample (Johansen *et al*., 2013). Similar to those with ARMS, people with early psychosis were found to experience difficulty with separation anxiety, interpersonal awareness and seeking approval from others (Na *et al*., 2016).

Early psychosis and quality of relationships

Three studies reported that those with early psychosis had poor quality social relationships. The findings of Allison *et al*. (2013) suggest that those with early psychosis were less satisfied with their friendship groups and felt more excluded by their peers. Additionally, those with early psychosis perceived that they had fewer people to turn to in a crisis (MacDonald *et al*., 2000). Moreover, they were more likely, than controls, to identify service providers as part of their network (MacDonald *et al*., 2000). Erickson *et al*. (1989) compared first episode affective and non-affective psychoses with a control group. Results indicated that the non-affective sample perceived that they had less close and confiding relationships than controls. No differences were found between controls and early psychosis samples with regards to perceived social support and perceptions of numbers of acquaintances or of reciprocal relationships (Erickson *et al*., 1989; MacDonald *et al*., 2000).

Relationship with symptoms

Associations between relational functioning and symptoms were explored in ten samples (thirteen articles).

ARMS

Relationships were found between positive symptoms and interpersonal functioning in three samples (five articles). Specifically, interpersonal sensitivity was found to predict paranoid ideation (Masillo *et al*., 2012; McDonnell *et al*., 2018), suspiciousness and positive symptoms (Masillo *et al*., 2012). However, these relationships did not exist when depression was controlled for. Similarly, one study found that poor quality relationships were negatively associated with positive symptoms, but not once negative symptoms were controlled for (Fulford *et al*., 2013). Over short-term follow-up (8.3 months) improved quality of relationships was found to be related to improvement in positive symptoms (Niendam *et al*., 2007). A poorer quality study reported that this relationship did not exist over a longer follow-up period (2.5 years; Cornblatt *et al*., 2012). These follow up periods were uncontrolled.

Three higher quality studies found a relationship between relational functioning and negative symptoms. Two studies reported that quality of relationships was associated with negative symptoms (Cornblatt *et al*., 2007; Fulford *et al*., 2013) and one reported an association with interpersonal sensitivity (Masillo *et al*., 2016). Contrary to this, a poorer quality study reported no relationship between negative symptoms and quality of relationships over a follow up period (Cornblatt *et al*., 2012). Two studies found that as symptom severity increased, interpersonal problems increased and quality of relationships decreased (Mondrup & Rosenbaum, 2010; Robustelli *et al*., 2017). One higher quality study (Fulford *et al*., 2013) reported a relationship between quality of relationships and disorganised symptoms, however, this relationship ceased to exist once negative symptoms were controlled for.

Three studies explored relationships between relational functioning and non-psychotic symptoms. Two higher quality studies examined the relationship between anxiety and relational functioning and one found an association (Masillo *et al*., 2012) whereas Fulford *et al*. (2013) did not. However, Masillo and colleagues (2012) examined interpersonal sensitivity and Fulford *et al*. (2013) examined quality of relationships. Depression was found to be associated to both interpersonal sensitivity (Masillo *et al*., 2012) and relationship quality, even after negative symptoms and demographic characteristics were controlled for (Fulford *et al*., 2013). Interpersonal sensitivity was found to correlate with stress in one study (Masillo *et al*., 2012).

One longitudinal study (Niendam *et al*., 2007) examined links between quality of relationships and cognitive functioning over 8.3 months. Improvement in quality of relationships associated with improved processing speed and visual memory over time. However, baseline cognitive performance did not predict improvement in relational functioning at follow up. This study used an uncontrolled follow-up period.

Early psychosis

Two higher quality studies found relationships between symptoms and relational functioning. A significant correlation was found between positive symptoms and submissive behaviour (Allison *et al*., 2013). Quality of relationships was found to correlate with positive symptoms, as well as negative and disorganised symptoms. Anxiety was found to be unrelated to relationship quality (Fulford *et al*., 2013).

Conversion to psychosis

Two datasets (four articles; Cannon *et al*., 2008; Cornblatt *et al*., 2007; Cornblatt *et al*., 2012; Song *et al*., 2013) explored relational functioning and conversion to psychosis. Mixed findings were reported. Data from three articles/one data set (Cannon *et al*., 2008; Cornblatt *et al*., 2007; Cornblatt *et*

al., 2012) indicated links between relationship quality and conversion to psychosis, whereas, another study of high quality found no association between baseline relational functioning and conversion, over a 24-month period (Song *et al*., 2013). The onset of psychosis did not further disrupt relational functioning in one poorer quality study (Cornblatt *et al*., 2012).

Associations with psychological constructs

ARMS

Three higher quality studies (Cornblatt *et al*., 2007; Fulford *et al*., 2013; Song *et al*., 2013) reported that quality of relationships associated with general functioning. Interpersonal sensitivity was found to be unrelated to role functioning (Masillo *et al*., 2016), whereas, quality of relationships was found to correlate with role functioning (Cornblatt *et al*., 2007). Better quality of relationships was associated with higher cooperativeness in one study (Song *et al*., 2013). One study found severity of bullying to predict interpersonal sensitivity; interpersonal sensitivity was also found to mediate the relationship between severe bullying and state paranoia (McDonnell *et al*., 2018). Associations between interpersonal sensitivity and avoidant ways of coping were found in one study (Masillo *et al*., 2012). Changes in quality of relationships was found to be unrelated to participation in psychological therapy (Niendam *et al*., 2007).

Early psychosis

Interpersonal functioning was also associated with general and adaptive functioning in two early psychosis samples (Erickson *et al*., 1989; Erickson *et al*., 1999; Fulford *et al*., 2013). One study found correlations with lower harm avoidance and higher self-directedness in a FEP sample (Song *et al*., 2013). Higher patient rated therapeutic alliance was associated with lower interpersonal problems in the submissive/hostile domain (Johansen *et al*., 2013). This study also found certain personality attributes to correlate with

interpersonal problems, for example, neuroticism positively correlated with dominant and submissive behaviours.

Discussion

The present review sought to examine the current state of evidence regarding quality of interpersonal relationships and patterns of interpersonal functioning in people with ARMS and early psychosis. Findings suggest this population experiences difficulties with interpersonal functioning which reflect a tendency towards being under-assertive and submissive when relating to others. Additionally, poor quality relationships appear evident. Results indicate that people with ARMS and early psychosis experienced less satisfaction and support, as well as more strain in relationships. Moreover, they perceived that they have fewer mutually supportive and reciprocal relationships. Difficulties in relationships were not strongly linked to positive symptoms, evidence supported links with depression, negative symptoms and emotional distress. These findings add to previous reviews which suggest that people with early psychosis have reduced numbers of social relationships (Gayer-Anderson & Morgan, 2013) and that those with ARMS have poor social cognition (van Donkersgoed *et al*., 2015). Taken together the findings of these reviews indicate significant difficulties across a multitude of social domains, reflecting significant difficulties relating with others.

Findings from this review indicate that interpersonal problems and poor quality relationships are present in the early stages of the disorder. These results add to findings from previous reviews which suggest reduced networks and poor social cognition during the early stages (Gayer-Anderson & Morgan, 2013; van Donkersgoed *et al*., 2015). The evidence from this review is limited and tentative with regards to whether relational deficits arise prior to onset. In part, this is due to the nature of the ARMS, as by definition some will be 'false positives' (i.e. they will not convert to psychosis). Longitudinal follow up studies are indicated to address the difficulty of measuring interpersonal functioning

prior to onset. At the same time, results indicate that those with ARMS may have significant difficulties with relating to others, whether they convert to psychosis or not (Fusar-Poli, Yung, McGorry & van Os, 2014). Clinical services may wish to consider how the needs of these individuals may be best addressed. These findings reflect that potentially conversion to psychosis (and subsequent focus on treatment of symptoms) is not the only important treatment focus. Instead, findings lend support to the idea that interventions focused on improving relational aspects of functioning would likely be useful across this whole help-seeking group (i.e. whether or not they develop psychosis).

The findings of this review provide preliminary evidence that difficulties in relational functioning are related to poor global functioning. This finding is perhaps unsurprising as there is robust evidence linking interpersonal relationships with a variety of important outcomes in the general population and clinical groups (Berkham, Glass, Brissette & Seeman, 2000; Teo, Choi & Valenstein, 2013; Umberson & Montez, 2010). It is of note, that measures of global functioning (e.g. the Global Assessment of Functioning, DSM-IV-TR) often include relational functioning as part of their measurement. This may partially explain the relationship between these variables. Future longitudinal research, utilising distinct outcome measures, may shed light on this matter and allow for the relationship between these two differential components to be fully understood.

Evidence was mixed in relation to links between difficulties with relationships and symptoms. The limited evidence suggests a potential link with depressive and negative symptoms, as well as emotional distress. There are social aspects of both negative symptoms and depression, for example, withdrawal from others, which could theoretically contribute to poor relational functioning. Cognitive theory may also support this idea, as people may struggle to relate to others as a result of negative views of the self, others and the world (Beck,

1995). Although these relationships may function in reverse. People may struggle to relate to others and as a result, depression, negative symptoms and emotional distress may be an adaptation and way of coping with relational difficulties. In this scenario, it could be theorised that emotional distress, negative symptoms and depression may perpetuate these difficulties, and vice versa, suggesting a potential bidirectional relationship. Further research is advocated to tease apart the nature of these relationships.

Each study utilised an outcome measure that was either participant or researcher rated. However, interpersonal relationships by nature involve two people, and two perspectives. A review of instruments examining social networks in psychosis indicated that 'the others' perspective was not being captured via current measures (Siette, Gulea & Priebe, 2015). Future studies may wish to consider whether new instruments require developing or current ones adapted in order to explore 'the others' perspective. Qualitative studies are well placed to shed light on this perspective, for example, Brand, Harrop & Ellett (2011) identified that persisting with the relationship was a key contributing factor to positive relational functioning from 'the others' perspective.

Cognition and social cognition were also poorly addressed by the studies. Previous reviews report links between these constructs and functional outcome in early psychosis, ARMS and schizophrenic samples (Allott, Liu, Proffitt & Killackey, 2011; Cotter *et al*., 2014; Fett *et al*., 2011). However, the studies in this review poorly addressed links between cognition, social cognition and interpersonal relationships (a potential sub domain of functional outcome). Future research could examine whether these known deficits relate to and or/predict interpersonal problems.

Additionally, high levels of loneliness are thought to be endemic in people with early psychosis (Sunderman *et al*., 2014). However, only one study in this

review addressed loneliness and interpersonal relationships; this paper reported an association between these constructs (Robustelli *et al*., 2017). Preliminary evidence from qualitative studies provides some insight into potential mechanisms underlying this link. For example, participants reported feeling excluded, stigmatised and isolated and found themselves preferring to spend time with service users, who they perceived to have better understanding of their difficulties (MacDonald *et al*., 2005; Mackrell & Lavender, 2004). That is, social withdrawal may be an adaptive response to relational difficulties but the cost of this is potentially loneliness. However, empirical evidence is required to substantiate these ideas.

Limitations of the studies included in the review

The sample sizes of several of the studies were small to modest which can increase the risk of type I and II errors, it is suggested that future studies seek to recruit larger samples. Additionally, there is a lack of longitudinal data from the studies included in this review. The samples suffered from being gender biased towards males, potentially relationship difficulties for females differ, especially during late adolescence when the onset of psychosis frequently occurs. However, study samples being mainly male is also an artefact of the broader psychosis literature, therefore findings can be compared across psychosis research more broadly. Few of the studies utilised well controlled comparison groups. It is suggested that future researchers aim to recruit well controlled comparisons groups. Furthermore, the samples were biased towards including participants that were in treatment. Although this increases homogeneity, it means that relationship difficulties experienced by those not in services were not captured.

Eight different outcome measures were utilised across the studies. This may reflect the multi-faceted nature of relational functioning; however, it also means that comparisons are less easily drawn. The IIP, the GFSS and the IPSM were the most widely used outcome measures. Future researchers may wish to

consider utilising one of these measures to enable closer comparisons across facets of relational functioning. Despite a variety of measures being used, results pointed to the same conclusions - deficits were present across all facets of relational functioning.

Limitations of the review

This review was limited to studies of the English language; therefore, findings do not reflect relational difficulties experienced by those out with this remit, which could potentially differ. However, the included studies span a wide geographical area and are not limited to the United States, as has been a limitation of previous reviews (e.g. Palumbo *et al*., 2015). This review included pure measures of relational functioning and excluded multi-dimensional and non-standardised measures. This is both a strength, as specific areas of relational functioning were reviewed, and a weakness as the findings from studies including the latter types of measures were not encompassed. Lastly, the quality assessment tool utilised, although based on guidelines, was adapted and does not have reliability or validity data. However, the tool benefits from being specifically adapted to address the needs of this study and inter-rater reliability was included to increase validity.

Clinical Implications

The high levels of relational difficulties established in this review indicate that psychological interventions targeting these problems (e.g. difficulties asserting needs in relationships, perceived unsatisfactory quality of relationships and distress associated with interpersonal functioning) may be appropriate (e.g. Gumley & Schwannauer's (2006) Cognitive Interpersonal Model). The initial stages of the illness are considered critical in terms of malleability and determining trajectory, suggesting that interventions at this stage could have a significant impact on relational functioning (Birchwood & Fiorillo, 2000; Harrison *et al*., 2001). Evidence from recent reviews is mixed as to the effectiveness of improving social and relational functioning. A systematic

review and meta-analysis found that interventions failed to improve social functioning in ARMS (Devoe, Farris, Townes & Addington, 2018) but a separate review concluded that novel treatments targeting cognitive deficits may improve functional outcomes for FEP (Santesteban-Echarri *et al*., 2017). However, these reviews did not solely address quality of relationships and patterns of interpersonal relating. Future research could explore the development and piloting of treatments targeting these specific deficits. In particular the findings from this review suggest the following potential treatment targets: increasing ability to assert and prioritise one's needs, developing interpersonal awareness, anxiety and distress regarding relating to others and addressing conflict and strain in relationships.

Future Research

Several factors were not encapsulated by the studies in this review, including factors that may contribute to the development of poor relational functioning. Psychological theory suggests that childhood attachment relationships influence later life relational functioning (Bowlby, 1973). Attachment and interpersonal functioning have been linked in people with psychosis (Berry *et al*., 2008). However, no studies in this review explored this relationship. Additionally, links between trauma and neglect and relational functioning (e.g. Briere, 1992; Cotter, Kaess & Yung, 2015; Lysaker, Meyer, Evans, Clements & Marks, 2001) were poorly addressed. Links between interpersonal trauma and social functioning have been reported in a FEP sample (Stain *et al*., 2014) indicating that traumatic experiences may also influence quality of relationships and interpersonal functioning. Only one study in this review addressed childhood adversity, specifically bullying, and findings indicate that this was related to interpersonal sensitivity (McDonell *et al*., 2018). The lack of research into predictors of poor relational functioning indicate that future research is required, attachment and trauma are two potential avenues.

Conclusions

People with ARMS and early psychosis have significant relational difficulties, these problems appear early in the course of the disorder and appear related to general functioning. This review compliments others in the field by highlighting significant deficits across another social domain early in the disorder, in addition to social cognition (van Donkersgoed *et al*., 2015) and reduced social networks (Gayer-Anderson & Morgan, 2013), reflecting significant widespread relational difficulties. There is limited evidence suggesting relational difficulties may be related to distress, however, further exploration is required. Further research into factors predicting poor interpersonal functioning and the potential impact of these difficulties is recommended. Clinicians may wish to consider the interpersonal needs of their clients, as difficulties appear widespread and potentially distressing.

References

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List of Appendices

Appendix A: Author guidelines for 'Psychology and Psychotherapy: Theory, Research and Practice'

Author Guidelines

Psychology and Psychotherapy: Theory Research and Practice (formerly The British Journal of Medical Psychology) is an international scientific journal with a focus on the psychological aspects of mental health difficulties and well-being; and psychological problems and their psychological treatments. We welcome submissions from mental health professionals and researchers from all relevant professional backgrounds. The Journal welcomes submissions of original high quality empirical research and rigorous theoretical papers of any theoretical provenance provided they have a bearing upon vulnerability to, adjustment to, assessment of, and recovery (assisted or otherwise) from psychological disorders. Submission of systematic reviews and other research reports which support evidence-based practice are also welcomed, as are relevant high quality analogue studies and Registered Reports. The Journal thus aims to promote theoretical and research developments in the understanding of cognitive and emotional factors in psychological disorders, interpersonal attitudes, behaviour and relationships, and psychological therapies (including both process and outcome research) where mental health is concerned. Clinical or case studies will not normally be considered except where they illustrate particularly unusual forms of psychopathology or innovative forms of therapy and meet scientific criteria through appropriate use of single case experimental designs.

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Appendix B: Quality assessment criteria

Quality Criteria Guidance

- These criteria are designed to assesses methodological quality and risk of bias
- The criteria cover observational, longitudinal and intervention studies. Intervention studies are being assessed as cross sectional studies.
- Assign each criteria with; 2 (well covered), 1 (adequately covered), 0 (poorly addressed, not addressed) or not relevant (NR) for each study. If rated 0 please state the category within this
- Some items only apply to certain study types (e.g. longitudinal), these are marked in italics
- Quality criteria were developed/adapted from NIH and AHRQ guidelines

Criteria	Rating	Definition	Comment
1. Is the research question clearly stated and appropriate?	2	Clearly stated hypothesis/hypotheses, variables and direction of relationship predicted	
	1	Still a definite research question but less clearly defined	
	0	No clear question/hypothesis	
2. Study design appropriate for the stated aims?	2	Study design is ideal for the question	
	1	The design is satisfactory and can answer the question(s) but another design could have been preferable	
	0	Study design inappropriate for question(s)	
3. Study population	2	Inclusion/exclusion clearly defined and important exclusions applied (e.g. intellectual disabilities) Diagnosis of psychosis spectrum disorder. A	

		standardised tool was used to assess diagnosis (e.g. SIPS, DSM, ICD) Balanced gender (at least 60:40)	
	1	Some of the criteria above are met but not all	
	0	None of the criteria above are met	
4. Sample size justification	2	Sufficient to power the study For small N the authors try to limit the damage through statistical measures. Was the impact of small N acknowledged? Apriori power analysis? (preferable if small sample) Estimates of variance/effect size mentioned	
	1	Some of the above criteria are covered/limitations are acknowledged/accounted for	
	0	None of the above criteria are covered	
5. Recruitment procedure – clearly explained and representative/unbiased ?	2	Was this done in an unbiased and representative manner? Are all the participants in treatment or is there a mix of people in and out of treatment?	

		From one service/area only or mixed geographical area?	
	1	Some of the above criteria are covered	
	0	None of the above criteria are covered	
6. Is the sample adequately described?	2	Demographics Age, gender, ethnicity Education, SES	
	1	Education and SES not mentioned	
	0	Only one/none of these factors mentioned	
7. For studies with more than one group -Were the groups similar on important characteristics that could affect outcomes (e.g., demographics, risk factors, co-morbid conditions)	2	All of these factors are similar and there are not statistically significant differences	
	1	Majority are similar	
	0	Majority are not similar	
8. Interpersonal functioning/quality of relationships outcome measure	2	Standardised measure Appropriate Clearly defined and described Valid and reliable – ideally this should be quoted in paper but the focus should be on the measure itself rather than the reporting so refer to original validation papers.	
	1	Standardised measure	
	0	None addressed	
9. Other outcome measures	2	Standardised measure Appropriate Clearly defined and described	

		Valid and reliable – ideally this should be quoted in paper but the focus should be on the measure itself rather than the reporting so refer to original validation papers.	
	1	Standardised measures (mostly)	
	0	None addressed	
10. Was loss to follow-up after baseline 20% or less?	2	Yes	
	1	Close to this i.e. less than or equal to 25%	
	0	More than 25%	
11. Adequate follow up period	2	Appropriate, too short or too long? Consider this in context of the research questions Has justification been provided for the length of follow up?	
	1	Some of these factors addressed	
	0	None addressed	
12. Analysis methods appropriate?	2	Were the methods appropriate for the research question and the type of data? The basic data is well described. Were confounding factors controlled for?/Addressed Was small sample size controlled for?	
	1	A couple of these factors were addressed	
	0	None of these factors addressed	
13. Limitations addressed in the context of the findings?	2	Limitations specific to the study are addressed and the	

		impact of these is discussed in detail	
	1	Limitations are brief/generalised and specificity not discussed	
	0	Not discussed/study findings are blown out of proportion/context	
14. Were any funding sources/conflicts of interests that may affect the authors interpretations of the results acknowledged?	2	Acknowledged	
	1	Partially acknowledged	
	0	Not addressed at all/appears there is significant bias/conflict of interest	

Trauma, Mentalisation and Interpersonal Problems in Psychosis

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(Word count=6324)

The authors report no conflict of interest

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Abstract (Word count=200)

Objectives

The study aimed to explore relationships between experiences of trauma, ability to mentalise and interpersonal problems in people with psychosis. Specifically, it was hypothesised that mentalising would mediate the relationship between childhood adversity and interpersonal problems.

Methods

The study used a cross-sectional design. Forty-eight participants diagnosed with schizophrenia-spectrum disorders were recruited. Data was collected via self-report questionnaires, a semi-structured interview and a cartoon-based task. Outcome measures assessed the following psychological constructs; interpersonal problems, childhood abuse and neglect, current trauma symptomatology, mentalising ability and psychotic symptomatology.

Results

Mentalisation did not mediate the relationship between childhood adversity and interpersonal problems. Current trauma symptoms and emotional distress were found to mediate the relationship between childhood adversity and interpersonal problems. Current trauma symptoms also mediated the relationship between childhood adversity and negative symptoms. High levels of current trauma related distress and mentalising difficulties were found. Mentalising did not relate to expected psychological constructs, aside from cognitive symptoms.

Conclusions

Results suggest that responses to trauma (i.e. current trauma symptoms and emotional distress) are important factors to consider and potentially address when working with this population. Results indicate that experiences of trauma

and neglect may influence trauma symptoms, emotional distress, interpersonal problems and negative symptoms.

Key words: psychosis, interpersonal problems, mentalisation, trauma, distress

Introduction

Trauma and interpersonal functioning

People with psychosis have increased levels of trauma and adversity in their histories (Gaudiano & Zimmerman, 2010; Schäfer & Fisher, 2011). Exposure to childhood adversity is thought to significantly increase risk of developing psychosis (Varese *et al*., 2012). Specific traumas have been linked to specific psychotic symptoms and symptom severity (Bentall *et al*., 2014; Longden, Sampson & Read, 2015; Reiff, Castille, Muenzenmaier & Link, 2012; van Dam *et al*., 2015). There is debate about the potential etiological nature of trauma and neglect (Selten, 2016; van Winkel, van Nierop, Myin-Germeys & van Os, 2013) with a large amount of evidence pointing to a causal role (Bentall *et al*., 2014; Isvoranu *et al*., 2016). Research into the underlying psychological mechanisms and potential mediating factors remains in the early stages and is a current research priority in the field (Bentall *et al*., 2014).

Experiencing trauma has been linked to poorer psychosocial outcomes and social dysfunction in people with psychosis (Alameda *et al*., 2015; Cotter, Kaess & Yung, 2015; Palmier-Claus *et al*., 2016). Evidence suggests that psychosocial difficulties are apparent prior to onset and throughout the course of the disorder (MacBeth *et al*., 2014; Masillo *et al*., 2012). A cognitive model suggests that events such as childhood adversity impact on belief systems, which influence how people with psychosis interact in the world (Garety, Kuipers, Fowler, Freeman & Bebbington, 2001). Poor social functioning has been linked to a number of outcomes, including increased hospitalisations (Norman *et al*., 2005), increased psychotic symptomatology (Collip *et al*., 2013), poor general functioning (Norman *et al*., 2011) and is thought to predict relapse (Robinson *et al*., 1999).

In spite of this, there is little research regarding links between interpersonal functioning and trauma in psychosis. Interpersonal functioning encapsulates

the specific ways people interact with others, this includes behaviour in social relationships such as behaving in a dominating or under-assertive manner. Interpersonal functioning is potentially a mechanism underlying social functioning. Relating to others has been indicated as a difficulty for people with psychosis (Penn *et al*., 2004), for example, people with psychosis are thought to experience difficulty initiating social interactions and expressing feelings and needs (Mondrup & Rosenbaum, 2010). Interpersonal problems have been linked to therapeutic alliance, and attachment styles in people with psychosis (Berry, Barrowclough & Wearden, 2008; Johansen, Melle, Iversen & Hestad, 2013; Associations between childhood adversity and later life interpersonal dysfunction have been reported in non-clinical and clinical populations, for example those with anxiety and depression (Briere & Runtz, 2002; Cole & Putnam, 1992; Huh, Kim, Yu & Chae, 2014; van der Kolk, Roth, Pelcovitz, Sunday & Spinazzola, 2005).

Nevertheless, these relationships have been poorly addressed within a psychosis context. Two studies have reported that poor interpersonal functioning is related to childhood trauma and sexual abuse in people with psychosis (Lysaker, Meyer, Evans, Clements & Marks, 2001; Stain *et al*., 2014). However, these studies did not use specific interpersonal functioning outcome measures. Furthermore, they did not address neglect. It is important to understand how interpersonal functioning and trauma relate within a psychosis population, in order to enable treatments to be developed to target potential underlying mechanisms.

Interpersonal functioning and negative symptoms

There is mixed evidence regarding the relationship between psychosocial functioning and negative symptoms, with some research suggesting that these concepts are related, whereas others indicate the reverse (Macbeth et al., 2013; Masillo *et al*., 2012; Pinkham & Penn, 2006). It could be argued that negative symptoms contribute to psychosocial difficulties (i.e. via poor self-

concept, low motivation, apathy), or vice versa and psychosocial difficulties impact on these facets of negative symptoms. It may be theorised that psychosocial functioning and negative symptoms are related bi-directionally, moreover, both psychosocial difficulties and negative symptoms could be part of the sequalae of trauma. This study aimed to explore this relationship in a psychosis sample.

Trauma and mentalising

Mentalising has been defined as thinking about our own mental states and those of others (Bateman & Fonagy, 2012). This study aimed to examine several aspects of this multi-faceted construct, including attribution of emotional and cognitive states (to self and others), 'hypermentalising' (over attribution of mental states) and 'hypomentalising' (under attribution of mental states) (Fonagy *et al*., 2016). People with psychosis are thought to experience difficulties with various aspects of mentalising, these difficulties are thought to be significant and stable across the course of the disorder (Bora, Yucel, & Pantelis, 2009; Sprong, Schothorst, Vos, Hox & van Engeland, 2007).

Mentalising develops early in life and is thought to be shaped by a person's interactions with their social environment. Factors such as parental childhood abuse are thought to reduce the formation of effective mentalising (Ensink *et al*., 2015). It has been theorised that when children suffer abuse they can develop a 'phobic avoidance' of mentalising in order to cope and survive (Chiesa & Fonagy, 2014). Relationships which are based on reciprocal respect, alliance and understanding are thought to encourage the development of mentalising (Liotti & Gilbert, 2011). Links between childhood adversity and difficulties with mentalising have been found in a sample diagnosed with borderline personality disorder (Brune, Walden, Edel & Dimaggio, 2016). Additionally, these associations have recently been established in a psychosis sample (Weijers *et al*., 2018).

Mentalising and interpersonal problems

Mentalising is thought to help us make sense of our life experiences and shape our self-representations; it is thought to be crucial to relational functioning (Couture, Penn & Roberts, 2006; Van Os, Kenis & Rutten., 2010). Disrupted mentalising has been associated with difficulties in social functioning and poor psychosocial outcomes in people with psychosis (Lysaker & Dimaggio, 2014; Penn, Sanna & Roberts, 2008). Furthermore, social cognition (of which mentalising is a subdomain) has been found to be one of the strongest predictors of social functioning (Brüne, 2005; Fett *et al*., 2011). However, this link has not been extended to interpersonal functioning. A meta-analysis of mentalising in psychosis advised that although conceptually mentalising and interpersonal functioning appear to be linked, providing empirical evidence of this relationship within this population is key (Sprong *et al*., 2007).

Aims of the study

From the literature discussed it appears that mentalising may act as a mediator between experiences of trauma and abuse and interpersonal functioning, nevertheless, these relationships require empirical exploration within a psychosis population. This study aimed to explore the relationship between trauma, mentalising and interpersonal problems. To the best of our knowledge this is the first study to examine the relationships between these three psychological constructs. Specifically, this project aimed to address the following hypothesis and research question:

Primary hypothesis:

i) Mentalising (Reflective Functioning Questionnaire and the Cartoon-Based Assessment of Mentalising Skills) will mediate the relationship between childhood trauma (total score on the Childhood Trauma Questionnaire) and interpersonal problems (total score on the Inventory of Interpersonal Problems) in people with a diagnosis of psychosis

Secondary, exploratory research question:

ii) What are the relationships between trauma (Impacts of Events Scale-Revised and the Childhood Trauma Questionnaire), mentalising (Reflective Functioning Questionnaire and the Cartoon-Based Assessment of Mentalising Skills) and interpersonal problems (Inventory of Interpersonal Problems and the Positive and Negative Syndrome Scale, Negative Symptoms Subscale) in people with a diagnosis of psychosis?

Methods

Study design

The study used a cross-sectional design. In order to increase sample size two studies were pooled by developing an overlapping battery of assessments. Recruitment took place over two geographical sites. A favourable opinion was obtained from the South East Scotland Research Ethics Committee and the University of Edinburgh School of Health in Social Science Ethics Committee. Relevant management approvals were received from NHS Lanarkshire and NHS Grampian (see appendix B).

Power calculation

Fritz and Mackinnon's (2007) 'rule of thumb' for simple mediation analyses using bootstrapping suggests that 54 participants are required to detect a medium effect and 34 participants are required to detect a large effect. Previous research studies reported medium effect sizes between similar variables to those being examined by this study (e.g. Bora *et al.*, 2006; Lysaker *et al.*, 2013), therefore, this study aimed to recruit 54 participants.

Participants and procedure

Forty-eight participants with psychosis spectrum disorders, as defined by the Diagnostic and Statistical Manual of Mental Disorders (American Psychiatric Association, 2013), were recruited from mental health services across NHS Lanarkshire and NHS Grampian. Ninety people were provided information about the study by their clinicians but 35 immediately declined participation. A further seven people initially opted into the study and subsequently decided they did not wish to take part. Inclusion criteria were as follows: over the age of 16 years old, experience of psychosis (including psychotic episode, schizophrenia, schizoaffective disorder and bipolar disorder) and ability to provide informed consent. Exclusion criteria included: solely drug induced psychosis, significant head injury or organic disease (e.g. dementia), significant intellectual disability, autism spectrum disorders and non-fluent English speakers.

Data collection sessions took approximately one hour and 40 minutes, over one or more sessions at the participant's discretion. Data collection sessions took place in health clinics, hospitals or at participants' homes (according to participant need). Researchers confirmed participants' diagnosis via health records. Capacity to provide informed consent was assessed by the researcher. Participants were thoroughly debriefed and provided with information on how to seek help, if distressed following participation.

Outcome Measures

A socio-demographic study specific questionnaire was developed. This included age, gender, ethnicity, diagnosis, medication, employment, education and duration of psychosis.

Childhood Trauma Questionnaire (CTQ; Bernstein & Fink, 1998)

This 28 item self-report questionnaire assesses experiences and severity of childhood abuse and neglect. The five subscales incorporate physical abuse,

sexual abuse, emotional abuse, physical neglect and emotional neglect. A minimisation/denial scale is encompassed to indicate under reporting. This measure has been widely used to assess experiences of trauma in people with psychosis (Duhig *et al*., 2015; Sheffield, Williams, Blackford & Heckers, 2013). Past research demonstrates self-report questionnaires are a valid method of measurement of childhood adversity in patients with psychosis (Dill, Chu, Grob & Eisen, 1991; Fisher *et al*., 2011). The questionnaire has good reliability and validity (Paivio & Cramer, 2004; Scher, Stein, Asmundson, McCreary & Forde, 2001). Internal consistency in the present study was excellent (Cronbach's alpha=.95). This measure was used as the primary independent variable (X) in the hypothesised mediation model.

Impact of Events Scale-Revised (IES-R; Weiss & Marmar, 1997)

This 22 item self-report questionnaire provides a measure of current trauma related distress and symptomatology. A total score can be calculated, higher scores reflect increased levels of trauma symptoms. The three subscales incorporate; intrusions, hypervigilance and avoidance. This measure has good psychometric properties, including high internal consistency and high concurrent validity (Creamer, Bell & Failla, 2003). The IES-R is reported to be a reliable measure of trauma distress in people with psychosis (White & Gumley, 2009). Internal consistency in this study was excellent (Cronbach's alpha=.95).

Reflective Functioning Questionnaire (RFQ-46; Fonagy *et al*., 2016)

This 46 item self-report questionnaire provides a measure of mentalisation. A six-point Likert scale is used. This measure provides two subscales; certainty and uncertainty regarding mental states. Higher scores on the certainty subscale indicate increased levels of 'hypermentalising', where one is overly confident and sure regarding the mental states of others. Whereas, higher scores on the uncertainty subscale are indicative of 'hypomentalising', where one lacks the ability to infer mental states of others. Increased scores on either

scale indicate difficulties with mentalising. This outcome measure has good psychometric properties including test-retest reliability and internal consistency (Fonagy *et al*., 2016). Internal consistency in this study was good (Cronbach's alpha=.81). This measure was used as the mediator (M) in the hypothesised mediation model.

Cartoon-Based Assessment of Mentalising Skills (Brune *et al*., 2016)

A novel tool was used as a second assessment of mentalising. The measure includes four cartoons which involve complex social interactions between characters. Each cartoon series is made up of seven pictures, participants are asked to sequence these as quickly as possible. For each card correctly sequenced one point is awarded (28 points total). Participants are asked to reflect on the mental states of the cartoons across each story. Two questions enquire about cognitive states and two about affective states. Participants are scored zero if they do not provide a mental state, one if they provide a correct but stereotyped response and two if they provide a range of mental states (16 points total). In the present study inter-rater reliability was good (K=.54, 95% CI [.23-.84], p=.002). This measure was used as the mediator (M) in the hypothesised mediation model.

Inventory of Interpersonal Problems (IIP-32; Horowitz, Alden, Wiggins & Pincus, 2000)

This 32 item self-report questionnaire assesses a range of interpersonal problems people can experience in relationships. Participants use five-point Likert scales to rate how distressing they find each problem. A total score can be calculated with higher scores indicating increased level of difficulty. Distancing and affiliating subscales were also calculated (MacBeth, Schwannauer & Gumley, 2008). Problems with initiating and sustaining relationships are reflected by the distancing subscale. Difficulties with managing relationships are reflected by the affiliation subscale. The eight-

subscale scoring method was also employed to provide descriptive information for the sample with regards to patterns of interpersonal problems. These subscales include; overaccommodating, needy, non-assertive, self-sacrificing, social-inhibition, cold, vindictive and dominant. Psychometric properties of the IIP-32 include high internal consistency, high test-retest reliability and good face validity (Barkham, Evans & Margison, 1998). Internal consistency in this study was good (Cronbach's alpha=.90). This measure was used as the primary dependent variable (Y) in the hypothesised mediation model.

The Positive and Negative Syndrome Scale (PANSS; Kay, Fiszbein & Opler, 1987)

The PANSS is a 30 item semi-structured interview. As recommended (by Wallwork, Fortgang, Hashimoto, Weinberger & Dickinson, 2012) this study employed the robust five-factor scoring method (van der Gaag *et al*., 2006). This includes the following subscales; positive symptoms, negative symptoms, emotional distress, cognitive disorganisation and excitement. Higher scores reflect increased symptomatology. This measure was selected to characterise the population. As mentioned previously this study aimed to explore the relationship between trauma, interpersonal problems and negative symptoms, therefore, this measure was included to examine this relationship further. The PANSS has good psychometric properties which include good inter-rater reliability (Kay, Opler & Lindenmayer, 1988; Peralta & Cuesta, 1994), high internal consistency, adequate test-retest reliability and external validity (Kay *et al*., 1987; Kay *et al*., 1988). In the present study levels of inter-rater reliability were good (K=.51, 95% CI [.26-.77], p<.001 to K=.67, 95% CI [.55-.80], p<.001). Internal consistency in this study was also good (Cronbach's alpha=.84).

Data analysis

Version 24 of SPSS was used for all analyses and the Hayes' PROCESS macro tool (v3.1) was used for mediation analyses (Hayes, 2018). Data was

explored in the first instance with descriptive statistics. Variables were checked for normality (using the Shapiro-Wilk test), skew and kurtosis. Correlational analysis was conducted using Pearson's correlations (for parametric data) and Spearman's correlations (for non-parametric data). Cohen's (1988) effect sizes were used to interpret correlations. Simple mediation analysis was used to investigate the roles of proposed mediators (M; mentalisation and current trauma symptoms) on the relationship between childhood trauma (X) and interpersonal problems (Y). The aforementioned model was also tested with negative symptoms as the outcome variable (Y), given that negative symptoms may be related to interpersonal functioning. Hayes' (2018) approach to mediation was employed which is advised for modest sample sizes and non-parametric data. This approach advises that mediation analysis is appropriate when there is no direct correlation between X and Y, as X could be impacting on Y through a mediator. Bootstrapped confidence intervals were based on 5000 resamples, with 95% confidence intervals. For direct effects significance testing was used, and for indirect effects bootstrapped confidence intervals were used. A significant mediation (indirect effect) is indicated where the confidence interval does not cross zero.

Results

Descriptive analysis

Sample characteristics

The mean age of the sample was 44.4 years (SD=13.4; range 19-78). The sample was 27.1% female and mainly white Caucasian British (97.9%). The diagnoses of the sample were as follows: 43.8% schizophrenia, 22.9% psychotic episode, 18.8% schizoaffective and 14.6% bipolar disorder. The mean duration of psychosis was 18.0 years (SD=13.2; range 0-48). The average age of onset was 26.4 years (SD=14.1; range 10.75). The majority of the sample reported taking anti-psychotics (91.7%). Participants were referred to the study via community mental health teams (37.5%), psychiatric

rehabilitation (33.3%), psychology (14.6%), acute inpatient psychiatry (8.3%), forensic services (4.2%) and self-referral (2.1%). The majority of the sample were unemployed (64.6%), 10.4% were carrying out voluntary work, 10.4% were registered students, 8.3% were retired and 6.3% were employed. Half of the sample had completed further education (25% college qualifications; 25% university degrees).

Table 1 displays descriptive data for the sample in relation to trauma, mentalising, interpersonal problems and psychotic symptoms.

Trauma

Childhood trauma and neglect. Rates of trauma and neglect were calculated using the CTQ dichotomous clinical cut-off scores which were designed to establish the presence and absence of abuse and neglect (Bevilacqua *et al*., 2012; Walker *et al*., 1999). Childhood physical neglect (50%), emotional abuse (47.9%) and emotional neglect (33.3%) were the most common, followed by physical abuse (25%) and sexual abuse (25%). Of those who had experienced childhood trauma and neglect 16.6% had experienced one form, 12.5% experienced two, 29.2% experienced three, 14.6% experienced four and 18.8% reported experiencing all five types. Rates of childhood trauma and neglect were similar to previous psychotic samples (e.g. Aas *et al*., 2016; Duhig *et al*., 2015).

Current trauma symptoms. Over half of the sample (54.2%) reported current trauma symptoms that were indicative of post-traumatic stress disorder (PTSD) at clinical levels. An additional 14.6% of the sample reported clinically relevant trauma symptoms that were below the PTSD cut off. This suggests that 68.8% of the sample were experiencing current trauma related distress. These rates are slightly higher than those reported in previous research (Bendall, Alvarez-Jiminez, Hulbert, McGorry & Jackson, 2012; Dallel, Cancel & Fakra, 2018).

Mentalising

Scores for the cartoon-based mentalising task indicated that the sample had poor mentalising across all domains (sequencing, cognitive and affective) when compared to both a sample with a diagnosis of borderline personality disorder, and a non-clinical control sample (Brune *et al*., 2016). Data from the RFQ indicated that the sample had poorer mentalising than personality disorder, eating disorder and non-clinical control samples (Fonagy *et al*., 2016). Results suggest that the sample had difficulties with both hypomentalising and hypermentalising.

Interpersonal problems

Scores were not significantly higher or lower than a normative sample (Horowitz *et al*., 2000). Comparatively, participants had more difficulty with affiliating behaviours, reflecting problems with managing relationships. They experienced difficulties with distancing behaviours, such as establishing and sustaining relationships to a lesser extent. Comparatively the sample experienced more interpersonal problems on the over-accommodating (M=8.13, SD=4.0), self-sacrificing (M=7.75, SD=4.2), socially inhibited (M=7.73, SD=4.6) and non-assertive (M=7.52, SD=4.6) subscales and less problems on the cold (M=5.81, SD=4.3), needy (M=5.0, SD=4.3), vindictive (M=4.8, SD=4.3) and dominant (M=2.3, SD=2.3) subscales. This pattern of difficulties is similar to previous FEP and psychosis samples (MacBeth, 2009; Mondrup & Rosenbaum, 2010).

Table 1: Descriptive characteristics of the sample

Variable	**M (SD) Range/%**
CTQ Emotional abuse	11.6 (6.7) 5-25
CTQ Physical abuse	7.9 (5.5) 5-25
CTQ Sexual abuse	7.6 (5.6) 5-25
CTQ Emotional neglect	11.9 (5.8) 5-25
CTQ Physical neglect	9.0 (4.4) 5-21
CTQ Total	48.1 (23.2) 25-105
CTQ Minimisation/denial	0.8 (1.1) 0-3
IES-R Intrusions	14.6 (8.9) 0-32
IES-R Avoidance	14.1 (8.7) 0-30
IES-R Hypervigilance	10.8 (6.8) 0-24
IES-R Total	39.5 (22.3) 0-85
IES-R <23 clinical cut off	29.2
IES-R >24 clinical concern	14.6
IES-R >33 PTSD cut off	6.3
IES-R >37 suppress immune functioning	47.9
Cartoon mentalising measure sequencing	15.7 (6.5) 1-28
Cartoon mentalising measure affective	6.7 (1.5) 2-8
Cartoon mentalising measure cognitive	6.1 (2.0) 1-8
RFQ Certainty	7.2 (5.4) 0-20
RFQ Uncertainty	10.5 (7.1) 0-34
IIP Affiliating	28.7 (12.5) 0-55
IIP Distancing	20.4 (11.1) 2-45
IIP Total	49.1 (21.3) 4-92
PANSS Positive	14.8 (5.0) 7-25
PANSS Negative	11.6 (5.1) 7-28
PANSS Cognitive disorganisation	15.6 (5.4) 9-29
PANSS Excitement	5.4 (2.1) 4-13
PANSS Emotional distress	11.2 (4.4) 4-13

Notes. N=47 for IES-R; N=46 for cartoon measure; M=mean; SD=standard deviation; CTQ=childhood trauma questionnaire; IES-R=impacts of events scale-revised; RFQ=reflective functioning questionnaire; IIP=inventory of interpersonal problems; PANSS=positive and negative symptoms scale.

Correlation analysis

Table 2 displays medium to large correlation coefficients between key variables. As predicted positive correlations were found between interpersonal problems and current trauma symptoms (IES-R). Childhood trauma and neglect were found to positively correlate with current trauma symptoms (IES-R). PANSS emotional distress positively correlated with current trauma symptoms (IES-R) and interpersonal problems. PANSS negative symptoms positively correlated with current trauma symptoms (IES-R). Expected correlations between mentalising and trauma/neglect were not found. Additionally, hypothesised correlations between childhood adversity and interpersonal problems were not found to be significant. Furthermore, expected correlations between mentalising and interpersonal functioning were not found.

Table 2: Correlation matrix for key psychological variables

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
1. IIP Total[a]	-	.91**	.89**	.52**	.41**	.52**	.48**	.25	.21	.11	.18	.23	.23	.17	-.22	-.01	.19	.16	.19	.19	.47**
2. IIP Affiliating[a]		-	.61**	.52**	.44**	.51**	.45**	.18	.22	.06	.17	.18	.17	.11	-.22	.07	.19	.18	.15	.20	.49**
3. IIP Distancing[a]			-	.42**	.28	.42**	.39**	.25	.15	.12	.11	.21	.24	.21	-.23	-.06	.14	.14	.18	.11	.36*
4. IES-R Total[a]				-	.94**	.90**	.87**	.42**	.37*	.31*	.41**	.31*	.45**	.06	-.10	.18	.25	.39**	.13	.25	.50**
5. IES-R Intrusions[a]					-	.72**	.79**	.49**	.47**	.36*	.37*	.39**	.45**	.06	.00	.17	.24	.35*	.23	.27	.49**
6. IES-R Avoidance						-	.69**	.28	.21	.12	.40**	.21	.35*	.07	-.23	.11	.22	.39**	-.01	.18	.41**
7. IES-R Hypervigilance							-	.37*	.32*	.38**	.35*	.23	.45**	.04	-.03	.16	.18	.31*	.18	.25	.49**
8. CTQ Total								-	.85**	.60**	.64**	.87**	.85**	-.10	-.01	.14	.20	.08	.28	.11	.21
9. CTQ EA									-	.48**	.52**	.67**	.60**	-.05	-.08	.23	.29*	.02	.32*	.11	.31*
10. CTQ PA										-	.57**	.40**	.41**	.02	.19	.26	.13	.10	.11	-.01	.16
11. CTQ SA											-	.47**	.47**	-.12	.09	.12	.08	.10	-.06	-.08	-.01
12. CTQ EN												-	.74**	-.09	.02	.12	.07	.03	.29*	.06	.12
13. CTQ PN													-	-.09	-.06	-.05	.18	.11	.17	.11	.26
14. CMM S[a]														-	-.37*	.05	-.22	.05	-.10	-.48**	.17
15. RFQ C															-	-.15	.16	.06	.8	.17	-.20
16. RFQ U																-	-.19	-.07	.01	-.05	.04
17. PANSS Positive[a]																	-	.26	.53**	.56**	.34*
18. PANSS Negative																		-	.01	.17	.47**
19. PANSS Excitement																			-	.62**	.11
20. PANSS Cognitive D																				-	.11
21. PANSS ED																					-

Notes. N=47 for IES-R; N=46 for CMM; [a]=not normally distributed; IIP=inventory of interpersonal problems; CTQ=childhood trauma questionnaire; IES-R=impacts of events scale-revised; CMM S=cartoon mentalising measure sequencing; RFQ C/U=reflective functioning questionnaire certainty/uncertainty; PANSS=positive and negative symptoms scale; Cognitive D=cognitive/disorganisation; ED=emotional distress; *=p<.05; **=p<.01; all correlations two-tailed.

Mediation analysis

Primary analysis

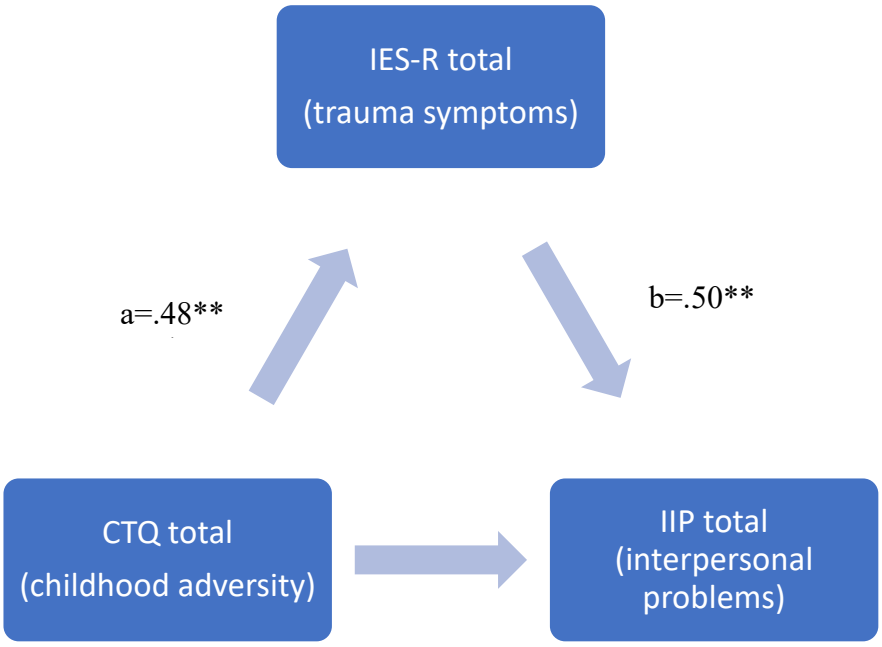
Contrary to hypothesis, but as correlational analysis indicated, mentalising did not mediate the relationship between trauma and interpersonal problems.

Secondary exploratory analysis

In the correlational analysis current trauma symptoms (IES-R) and emotional distress (PANSS) were noted to have significant associations with key variables and therefore were included as mediators in further analyses.

Figure 1 outlines the first mediation model predicting interpersonal problems. Childhood adversity did not have a significant direct effect on interpersonal problems, however, there was a significant indirect effect (mediation) through current trauma symptoms (IES-R total; β=.24, BCI=[.09-.44]). The model explained 27% of the variance in interpersonal problems.

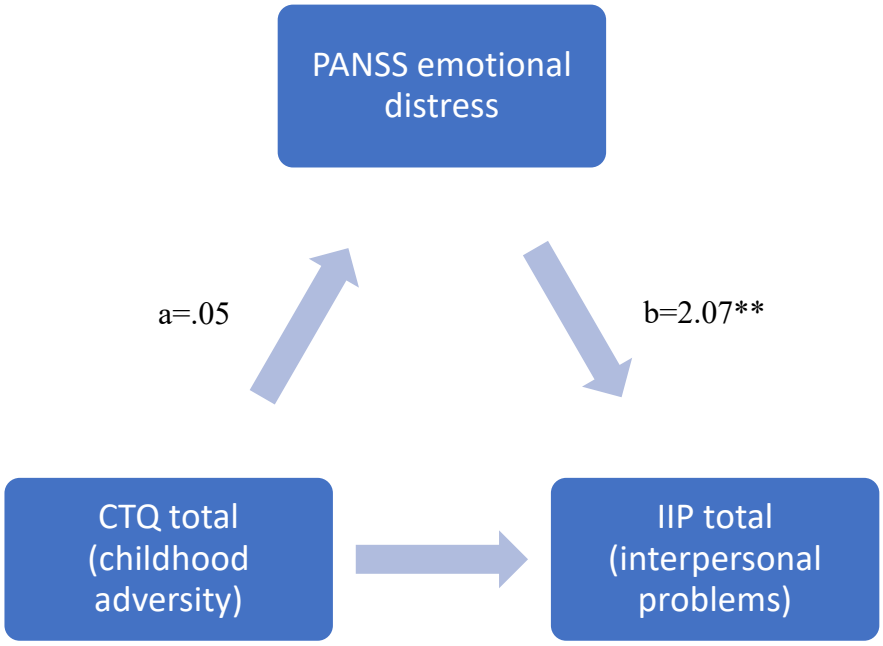
Figure 1: Model 1 predicting interpersonal problems



Total effect: c=.24, Direct effect: c'=.00

Figure 2 displays the second mediation model predicting interpersonal problems. There was no direct effect of childhood adversity on interpersonal problems, but there was an indirect effect through PANSS emotional distress (β=.11, BCI [.02-.23]). This model explained 24% of the variance in interpersonal problems.

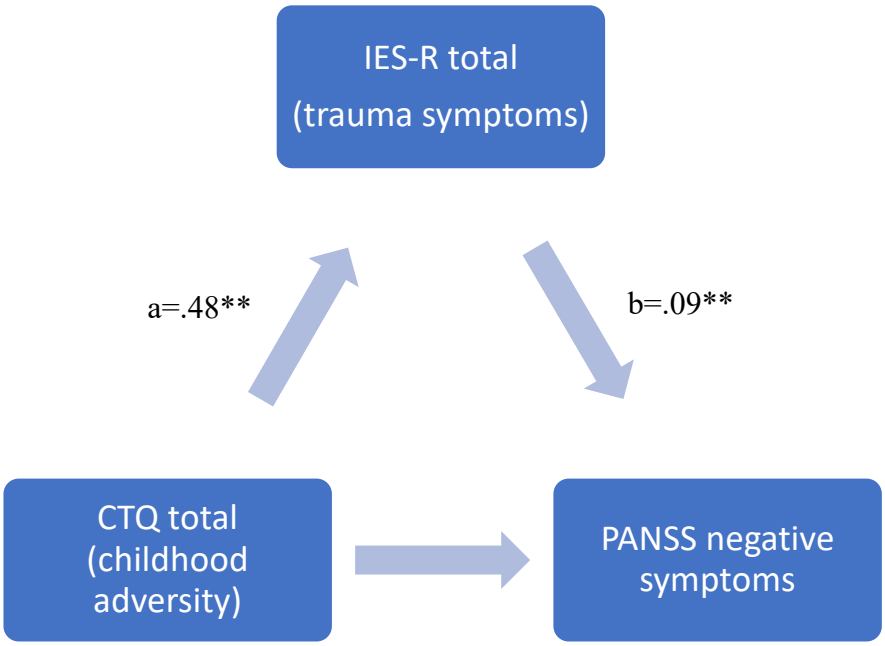
Figure 2: Model 2 predicting interpersonal problems



Total effect: c=.24, Direct effect: c'=.13

Figure 3 outlines the third mediation model predicting negative symptoms. Childhood adversity did not have a significant direct effect on negative symptoms, although, there was a significant indirect effect through current trauma symptoms (IES-R total; β=.04, BCI [.01-.10]). This model explained 14% of the variance in negative symptoms.

Figure 3: Model 3 predicting negative symptoms



Total effect: c=.04, Direct effect: c'=-.05

Discussion

This study aimed to explore relationships between trauma, mentalising and interpersonal problems in people with psychosis. The primary hypothesis was not found to be significant, mentalising did not mediate the relationship between trauma and interpersonal functioning as predicted. However, exploratory analysis from this study progresses current research by indicating that current trauma symptoms and emotional distress are important and potential mediating factors between childhood adversity and interpersonal problems, as well as between childhood adversity and negative symptoms. To the best of our knowledge this is the first study to report these findings.

Trauma, neglect and interpersonal problems

This study aimed to explore the relationship between trauma and interpersonal problems. Childhood adversity was found to indirectly affect interpersonal problems through current trauma symptomatology and emotional distress, suggesting that a person's response to trauma is an important factor by which childhood adversity influences how people relate to others later in life. This suggests that interpersonal problems may indicate a trauma response. These findings raise questions about risk and resilience, i.e. following trauma, who goes on to develop 'PTSD' symptoms, emotional distress and interpersonal problems, and who does not. Understanding these psychological processes would enable more refined treatments to be developed.

Rates of PTSD are thought to be higher in people with psychosis than the general population (Dallel *et al.*, 2018). There appear to be a host of risk factors indicating that people with psychosis are at higher risk of becoming distressed post trauma. Past research suggests that childhood attachment may have a role with regards to risk and resilience in relation to coping with traumatic events (Shapiro & Levendosky, 1999). People with psychosis are thought to have increased levels of attachment disruption (Gumley, Taylor, Schwannauer & MacBeth, 2014) which may contribute to lower resilience and poorer ability to cope with trauma distress (Alexander *et al.*, 1998; Mikuliner, Florian & Weller, 1993). People with psychosis are thought to experience increased levels of social problems, have less social support and higher levels of exclusion (Killaspy *et al.*, 2014; Stilo *et al.*, 2013), these factors may also explain why people with psychosis have poor resilience and coping styles in the context of trauma. Moreover, difficulties with alcohol and substance misuse (Brady & Sinha, 2005) may contribute to poor coping styles and increased risk for trauma related distress (Kaysen *et al.*, 2006). Furthermore, having a history of mental health difficulties, increased episodes of trauma and a family with a psychiatric history places people at risk of developing PTSD symptoms, all of which are thought to be common in people with psychosis (Bebbington *et al.*,

2004; Brewin, Andrews & Valentine, 2000; Mortensen, Pedersen & Pedersen, 2010).

Two theoretical models also help to explain the role of risk and resilience in relation to the effects of trauma. The diathesis-stress model (Neuchterlein & Dawson, 1986) suggests that people with psychosis have a biological risk to adapt poorly to psychosocial stressors such as childhood adversity. In addition, the traumagenic neurodevelopmental model (Read, Perry, Moskowitz & Connolly, 2001) posits that childhood trauma impacts on the development of the brain which contributes to an individual being less able to cope with stress and regulate their emotions effectively.

Past research also lends support to links found between distress and interpersonal problems in the present study. For example, trauma symptoms such as hypervigilance, intrusions and avoidance may lead individuals to have difficulties relating to and maintaining connections with others as a result of fear, mistrust and pre-occupation (Roesler & MacKenzie, 1994). Cognitive theories of trauma suggest that negative appraisals about the self, world and others following traumatic events contribute to poor interpersonal functioning (e.g. Foa & Rothbaum, 1998). The specific interpersonal difficulties which appear to be experienced by people with psychosis (under-assertiveness, self-sacrifice and difficulty prioritising their own needs) potentially reflect a fear-based trauma presentation. For example, with high levels of early trauma prevalent in this population (Varese *et al.,* 2012), it could be theorised that living in a fear-based state may allow little space for development of interpersonal skills.

It is of note that trauma related distress in this sample may or may not be related to childhood trauma. For some people their trauma distress could be explained by later life trauma (Larkin & Read, 2008) and/or trauma related to

psychotic episodes and subsequent treatment (e.g. hospitalisations; Berry, Ford, Jellicoe-Jones & Haddock, 2013).

Childhood adversity, mentalising and interpersonal problems

Our study aimed to cast light on the relationship between trauma, mentalising and interpersonal problems. Mentalising was found to be an area of difficulty for the sample, as echoed by previous research (Harrington, Siegert & McClure, 2005). However, mentalising did not relate to childhood abuse and neglect or interpersonal problems. In light of this, it is unsurprising, that contrary to hypothesis, mentalising did not mediate the relationship between childhood adversity and interpersonal problems.

Potentially, the measurement of mentalising in this study was problematic. Mentalising was found to be associated with cognitive symptoms, indicating that poor performance on the cartoon measure may be reflective of poor cognitive and/or executive functioning, which are suggested to be common in this population (e.g. planning, problem solving; Bora *et al*., 2009; Fioravanti, Carlone, Vitale, Cinti & Clare, 2005). It is possible the cartoon measure was partially assessing empathy and emotion recognition, as previous mentalising measures have been critiqued for (Sprong *et al*., 2007). The RFQ, although validated, has not been used extensively in research studies and further examination of this measure has been recommended (Fonagy *et al*., 2016). These potential difficulties may explain the lack of associations between mentalising and psychological variables in this study.

Although, both measures of mentalising appeared to reflect the same pattern of results, which may suggest that the forms of mentalising assessed do not relate to trauma or psychosocial functioning in people with psychosis, as others have also reported (Palmier-Claus *et al*., 2016; Weijers *et al*., 2018). Alternatively, the combination of a potential flooring effect with regards to

mentalising ability and a modest sample size may have contributed to, and increased, risk of a type II error.

The findings of this study point elsewhere in order to explain predictors and constructs related to mentalising. It is possible that specific forms of social cognition are related to specific psychological variables (Fett *et al*., 2011) and this study may have not captured these particular facets. Alternatively, there may not be a direct relationship between mentalising and trauma, and mentalising and interpersonal functioning. Instead these relationships may be mediated by other constructs. Attachment theory is one potential mediator which has been related to childhood adversity and how we learn to relate to and understand the intentions of others (i.e. mentalising and interpersonal functioning; Bowlby, 1973). This is a potential avenue for future research.

Trauma, negative symptoms and interpersonal functioning

This study looked to explore whether negative symptoms may be related to interpersonal problems. The lack of a direct correlation between interpersonal problems and negative symptoms is contrary to previous findings which suggest that negative symptoms may be predictive and related to interpersonal functioning (MacBeth *et al*., 2013). The results of our study instead appear to lend support to previous research which has reported a lack of association between these constructs (Collip *et al*., 2013; Masillo *et al*., 2012). However, current trauma related distress was found to mediate the relationship between childhood adversity and negative symptoms, indicating a similar pattern to interpersonal problems. Perhaps what these results reflect instead, is that negative symptoms (similar to interpersonal problems) are a response to trauma and trauma related distress (Morrison, Frame & Larkin, 2003).

Our model adds support to Mueser's theory (2002) that trauma distress mediates the effect of childhood adversity on severe mental illness (particularly psychotic illnesses). It is suggested that trauma distress affects mental illness

directly through symptoms such as avoidance, flashbacks, dissociation and hypervigilance, and indirectly through common correlates of PTSD, such as substance misuse and poor relational functioning. Our findings potentially reflect that in order to cope with the aftermath of trauma and subsequent trauma distress people deactivate, numb and avoid emotional experiences and difficult cognitions (i.e. negative symptoms) which can often result from childhood abuse (Liotti & Gumley, 2009). Links between childhood neglect, in particular, and negative symptoms have been found in previous research (Gallagher & Jones, 2013). Theoretically, blunted affect, lack of speech and withdrawal (negative symptoms) help people cope with distress associated with neglect; this may also be a learned coping style. Withdrawal may be an adaptive way of coping with distress, however, it may contribute to the high levels of loneliness in this population (Michalska, Rhodes, Vasilopoulou & Hutton, 2018).

Considerations and limitations

Recruitment for the current sample was informed by modern theory regarding a spectrum of psychosis (Guloksuz & van Os, 2018). Therefore, the sample is heterogeneous in the sense that a variety of psychotic diagnoses were included, both non-affective and affective as well as psychotic episodes. The sample was heavily biased towards males. Future research may seek to recruit samples with more equal gender distributions, to enable the perspectives of females with psychosis to be captured.

Although clinicians were encouraged to provide information to all patients who fulfilled inclusion/exclusion criteria, the sample was limited by who clinicians selected to invite to take part. The study was open to people not in health services, however, only people who were involved with health services took part. This may have been a product of the advertising methods of the study. Participants were heterogeneous with regards to the types and lengths of

treatment they had received. As in other research studies the perspectives and experiences of those who did not wish to participate were not captured.

The sample was uncontrolled, cross-sectional and did not include a control group. Therefore, the observed relationships may not be specific to this population, and inferences about causality are merely speculative. Additionally, the modest sample size potentially increased risks for both type I and type II errors.

Future research

Future research may wish to take the findings of this study further and ascertain to what extent interpersonal problems are a response to trauma or are present before the onset of trauma. Findings in the present study may not be specific to people with psychosis and future research could examine this relationship in other clinical groups as well as non-clinical groups. Additionally, as these appear to be novel findings with a modest and male biased sample, replication with a larger and balanced gender sample is suggested. As there was not an association between trauma and mentalising, and mentalising and interpersonal problems in this study, future research may seek to identify potential mediators between these variables. Attachment is one suggested mediator, alongside resilience and personality. As mentioned previously inconsistent findings are reported in the literature with regards to the predictors and correlates of mentalising. What is consistently reported are deficits across several domains of social cognition including mentalising. Perhaps, current measures of mentalising require refining to ensure that they specifically assess mentalising rather than other domains, or new measures of mentalising may require development and piloting. Moreover, in light of the heterogeneity of findings in relation to mentalising and links with other constructs, it is crucial for future researchers to report research findings whether there are statistically significant associations between mentalising and other psychological variables, or not.

Clinical implications

Findings point to trauma informed care and suggest that both past experience of trauma and the ways in which people have coped with trauma (current trauma symptoms, emotional distress, interpersonal problems and negative symptoms) are assessed, and addressed where relevant (Read, 1997). Research evidence suggests that this is not consistently happening (Callcott, Standart & Turkington, 2004; Davidson, 2001; McFarlane, Bookless & Air, 2001). Findings tentatively suggest that it may be fruitful to address current trauma symptoms and emotional distress, as addressing these may also impact positively on negative symptoms and interpersonal problems.

There are effective psychological interventions for trauma symptoms in the general population and there is preliminary evidence that adapted PTSD treatments can alleviate trauma distress, and potentially psychotic symptoms, in people with psychosis (Swan, Keen, Reynolds & Onwumere, 2017). There is also some support for the cognitive model of PTSD (Ehlers & Clark, 2000) being suitable for people with trauma distress and psychosis (Lommen & Restifo, 2009). Our findings add support to these forms of interventions, when based on thorough assessment and formulation.

Lastly, the specific interpersonal problems experienced by this group highlight difficulties with asserting and prioritising their own needs, as well as managing relationships. It may be useful for services to consider how this pattern of difficulties may impact on ability to seek help, relate to health professionals and benefit from interventions (Gurtman, 1996). Similarly, mentalising difficulties highlighted in this study provide some support for interventions targeting these deficits, such as mentalisation and metacognitive based therapies (Brent, Holt, Keshavan, Seidman & Fonagy, 2014; Van Donkersgoed *et al*., 2014). Poor ability to mentalise may have implications for Cognitive Behavioural Therapy for psychosis (CBTP), currently a

recommended treatment in the Matrix (NHS Education for Scotland, 2015) for this population. CBTP involves a significant amount of cognitive flexibility and reflective capacity in order to consider various explanations in reference to thoughts, feelings and behaviours. As mentalising in this sample did not relate to other expected psychological variables, and the measures used may not purely assess mentalising, these suggestions are tentative. It is suggested that potential deficits in mentalising are screened for and considered as part of wholistic assessment and treatment planning. Additionally, integrative treatments are indicated that allow space for trauma, distress, interpersonal problems, psychotic symptoms and mentalisation to be addressed where necessary.

Conclusion

Contrary to the a priori hypothesis in this study, mentalising did not mediate the relationship between trauma and interpersonal functioning. However, the second research question in this study looked to explore underlying mechanisms in relation to trauma, mentalising and interpersonal functioning in people with psychosis. These exploratory findings suggest that childhood trauma and neglect may influence interpersonal problems and negative symptoms via one's adaptation and response to trauma (i.e. through emotional distress and trauma related distress).

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List of Appendices

Appendix A: Author guidelines for 'Psychosis: Psychological, Social and Integrative approaches'

About the Journal

Psychosis is an international, peer-reviewed journal publishing high-quality, original research. Please see the journal's Aims & Scope for information about its focus and peer-review policy.

Please note that this journal only publishes manuscripts in English.

Psychosis accepts the following types of article: Research Articles, First Person Accounts, Brief Reports, Opinion Pieces, Letters to Editor and Book Reviews.

Peer Review

Taylor & Francis is committed to peer-review integrity and upholding the highest standards of review. Once your paper has been assessed for suitability by the editor, it will then be double blind peer reviewed by independent, anonymous expert referees. Find out more about what to expect during peer review and read our guidance on publishing ethics.

Preparing Your Paper

All authors submitting to medicine, biomedicine, health sciences, allied and public health journals should conform to the Uniform Requirements for Manuscripts Submitted to Biomedical Journals, prepared by the International Committee of Medical Journal Editors (ICMJE).

Structure

Your paper should be compiled in the following order: title page; abstract; keywords; main text introduction, materials and methods, results, discussion; acknowledgments; declaration of interest statement; references; appendices (as appropriate); table(s) with caption(s) (on individual pages); figures; figure captions (as a list).

Word Limits

Please include a word count for your paper.

The maximum word length for an Article in this journal is 6000 words (this limit includes tables, references and figure captions).

The maximum word length for a First Person Account is 3500 words.

The maximum word length for a Brief Report is 1500 words.

The maximum word length for an Opinion Piece is 1500 words.

The maximum word length for Letters to Editor is 400 words.

The maximum word length for a Book Review is 1000 words.

Style Guidelines

Please refer to these quick style guidelines when preparing your paper, rather than any published articles or a sample copy.

Any spelling style is acceptable so long as it is consistent within the manuscript.

Please use double quotation marks, except where “a quotation is ‘within’ a quotation”. Please note that long quotations should be indented without quotation marks.

Formatting and Templates

Papers may be submitted in Word format. Figures should be saved separately from the text. To assist you in preparing your paper, we provide formatting template(s).

Word templates are available for this journal. Please save the template to your hard drive, ready for use.

If you are not able to use the template via the links (or if you have any other template queries) please contact us here.

References

Please use this reference guide when preparing your paper.

An EndNote output style is also available to assist you.

Checklist: What to Include

1. **Author details.** Please ensure everyone meeting the International Committee of Medical Journal Editors (ICMJE) requirements for authorship is included as an author of your paper. All authors of a manuscript should include their full name and affiliation on the cover page of the manuscript. Where available, please also include ORCiDs and social media handles (Facebook, Twitter or LinkedIn). One author will need to be identified as the corresponding author, with their email address normally displayed in the article PDF (depending on the journal) and the online article. Authors' affiliations are the affiliations where the research was conducted. If any of the named co-authors moves affiliation during the peer-review process, the new affiliation can be given as a footnote. Please note that no changes to affiliation can be made after your paper is accepted. Read more on authorship.
2. Should contain a structured abstract of 200 words.
3. You can opt to include a **video abstract** with your article. Find out how these can help your work reach a wider audience, and what to think about when filming.
4. Between 5 and 6 **keywords**. Read making your article more discoverable, including information on choosing a title and search engine optimization.
5. **Funding details.** Please supply all details required by your funding and grant-awarding bodies as follows:
   For single agency grants

This work was supported by the [Funding Agency] under Grant [number xxxx].

For multiple agency grants

This work was supported by the [Funding Agency #1] under Grant [number xxxx]; [Funding Agency #2] under Grant [number xxxx]; and [Funding Agency #3] under Grant [number xxxx].

6. **Disclosure statement.** This is to acknowledge any financial interest or benefit that has arisen from the direct applications of your research. Further guidance on what is a conflict of interest and how to disclose it.
7. **Data availability statement.** If there is a data set associated with the paper, please provide information about where the data supporting the results or analyses presented in the paper can be found. Where applicable, this should include the hyperlink, DOI or other persistent identifier associated with the data set(s). Templates are also available to support authors.
8. **Data deposition.** If you choose to share or make the data underlying the study open, please deposit your data in a recognized data repository prior to or at the time of submission. You will be asked to provide the DOI, pre-reserved DOI, or other persistent identifier for the data set.
9. **Supplemental online material.** Supplemental material can be a video, dataset, fileset, sound file or anything which supports (and is pertinent to) your paper. We publish supplemental material online via Figshare. Find out more about supplemental material and how to submit it with your article.
10. **Figures.** Figures should be high quality (1200 dpi for line art, 600 dpi for grayscale and 300 dpi for colour, at the correct size). Figures should be supplied in one of our preferred file formats: EPS, PS, JPEG, GIF, or Microsoft Word (DOC or DOCX). For information relating to other file types, please consult our Submission of electronic artwork document.
11. **Tables.** Tables should present new information rather than duplicating what is in the text. Readers should be able to interpret the table without reference to the text. Please supply editable files.

12. **Equations.** If you are submitting your manuscript as a Word document, please ensure that equations are editable. More information about mathematical symbols and equations.
13. **Units.** Please use SI units (non-italicized).

Using Third-Party Material in your Paper

You must obtain the necessary permission to reuse third-party material in your article. The use of short extracts of text and some other types of material is usually permitted, on a limited basis, for the purposes of criticism and review without securing formal permission. If you wish to include any material in your paper for which you do not hold copyright, and which is not covered by this informal agreement, you will need to obtain written permission from the copyright owner prior to submission. More information on requesting permission to reproduce work(s) under copyright.

Disclosure Statement

Please include a disclosure statement, using the subheading "Disclosure of interest." If you have no interests to declare, please state this (suggested wording: *The authors report no conflict of interest*). For all NIH/Wellcome-funded papers, the grant number(s) must be included in the declaration of interest statement. Read more on declaring conflicts of interest.

Clinical Trials Registry

In order to be published in a Taylor & Francis journal, all clinical trials must have been registered in a public repository at the beginning of the research process (prior to patient enrolment). Trial registration numbers should be included in the abstract, with full details in the methods section. The registry should be publicly accessible (at no charge), open to all prospective registrants, and managed by a not-for-profit organization. For a list of registries that meet these requirements, please visit the WHO International Clinical

Trials Registry Platform (ICTRP). The registration of all clinical trials facilitates the sharing of information among clinicians, researchers, and patients, enhances public confidence in research, and is in accordance with the ICMJE guidelines.

Complying With Ethics of Experimentation

Please ensure that all research reported in submitted papers has been conducted in an ethical and responsible manner, and is in full compliance with all relevant codes of experimentation and legislation. All papers which report in vivo experiments or clinical trials on humans or animals must include a written statement in the Methods section. This should explain that all work was conducted with the formal approval of the local human subject or animal care committees (institutional and national), and that clinical trials have been registered as legislation requires. Authors who do not have formal ethics review committees should include a statement that their study follows the principles of the Declaration of Helsinki.

Consent

All authors are required to follow the ICMJE requirements on privacy and informed consent from patients and study participants. Please confirm that any patient, service user, or participant (or that person's parent or legal guardian) in any research, experiment, or clinical trial described in your paper has given written consent to the inclusion of material pertaining to themselves, that they acknowledge that they cannot be identified via the paper; and that you have fully anonymized them. Where someone is deceased, please ensure you have written consent from the family or estate. Authors may use this Patient Consent Form, which should be completed, saved, and sent to the journal if requested.

Health and Safety

Please confirm that all mandatory laboratory health and safety procedures have been complied with in the course of conducting any experimental work reported in your paper. Please ensure your paper contains all appropriate warnings on any hazards that may be involved in carrying out the experiments or procedures you have described, or that may be involved in instructions, materials, or formulae.

Please include all relevant safety precautions; and cite any accepted standard or code of practice. Authors working in animal science may find it useful to consult the International Association of Veterinary Editors' Consensus Author Guidelines on Animal Ethics and Welfare and Guidelines for the Treatment of Animals in Behavioural Research and Teaching. When a product has not yet been approved by an appropriate regulatory body for the use described in your paper, please specify this, or that the product is still investigational.

Appendix B: Ethical and management approval for the study

Lothian NHS Board

South East Scotland Research Ethics Committee 01

Waverley Gate
2-4 Waterloo Place
Edinburgh
EH1 3EG
Telephone 0131 536 9000

www.nhslothian.scot.nhs.uk

31 March 2017

Your Ref
Our Ref

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Dear Miss Reid

Study title: **How does Mentalizing and Interpersonal Functioning relate to adverse life events and service engagement in people who experience psychosis?**
REC reference: **17/SS/0033**
IRAS project ID: **222947**

Thank you for your letter of 24 March 201, responding to the Committee's request for further information on the above research and submitting revised documentation.

The further information has been considered on behalf of the Committee by the Vice-Chair.

We plan to publish your research summary wording for the above study on the HRA website, together with your contact details. Publication will be no earlier than three months from the date of this opinion letter. Should you wish to provide a substitute contact point, require further information, or wish to make a request to postpone publication, please contact hra.studyregistration@nhs.net outlining the reasons for your request.

Confirmation of ethical opinion

On behalf of the Committee, I am pleased to confirm a favourable ethical opinion for the above research on the basis described in the application form, protocol and supporting documentation as revised, subject to the conditions specified below.

Conditions of the favourable opinion

The REC favourable opinion is subject to the following conditions being met prior to the start of the study.

- It is noted that Point 4, from our Provisional Opinion letter, regarding the Clinician Referral Form appears not to have been addressed; "are there any known risks associated with home visits? If so, please detail below" without providing space to do so. This should be amended and a revised form submitted.

You should notify the REC once all conditions have been met (except for site approvals from host organisations) and provide copies of any revised documentation with updated version numbers. Revised documents should be submitted to the REC electronically from IRAS. The REC will acknowledge receipt and provide a final list of the approved documentation for the study, which you can make available to host organisations to facilitate their permission for the study. Failure to provide the final versions to the REC may cause delay in obtaining permissions.

Management permission must be obtained from each host organisation prior to the start of the study at the site concerned.

Management permission should be sought from all NHS organisations involved in the study in accordance with NHS research governance arrangements. Each NHS organisation must confirm through the signing of agreements and/or other documents that it has given permission for the research to proceed (except where explicitly specified otherwise).

Guidance on applying for NHS permission for research is available in the Integrated Research Application System, www.hra.nhs.uk or at http://www.rdforum.nhs.uk.

Where a NHS organisation's role in the study is limited to identifying and referring potential participants to research sites ("participant identification centre"), guidance should be sought from the R&D office on the information it requires to give permission for this activity.

For non-NHS sites, site management permission should be obtained in accordance with the procedures of the relevant host organisation.

Sponsors are not required to notify the Committee of management permissions from host organisations

Registration of Clinical Trials

All clinical trials (defined as the first four categories on the IRAS filter page) must be registered on a publically accessible database within 6 weeks of recruitment of the first participant (for medical device studies, within the timeline determined by the current registration and publication trees).

There is no requirement to separately notify the REC but you should do so at the earliest opportunity e.g. when submitting an amendment. We will audit the registration details as part of the annual progress reporting process.

To ensure transparency in research, we strongly recommend that all research is registered but for non-clinical trials this is not currently mandatory.

If a sponsor wishes to request a deferral for study registration within the required timeframe, they should contact hra.studyregistration@nhs.net. The expectation is that all clinical trials will be registered, however, in exceptional circumstances non registration may be permissible with prior agreement from the HRA. Guidance on where to register is provided on the HRA website.

It is the responsibility of the sponsor to ensure that all the conditions are complied with before the start of the study or its initiation at a particular site (as applicable).

NHS Lothian

Ethical review of research sites

NHS sites

The favourable opinion applies to all NHS sites taking part in the study, subject to management permission being obtained from the NHS/HSC R&D office prior to the start of the study (see "Conditions of the favourable opinion" below).

Approved documents

The final list of documents reviewed and approved by the Committee is as follows:

Document	*Version*	*Date*
Copies of advertisement materials for research participants [Poster]	1.1	24 March 2017
GP/consultant information sheets or letters [GP letter]	1	16 February 2017
Other [Debrief form]	1	16 February 2017
Other [CV - Helen Griffiths]	1	16 February 2017
Other [Clinician referral form]	1	16 February 2017
Other [brune et al 2016 paper using mentalizing measure]	1	22 February 2017
Other [Demographic information]	1.1	24 March 2017
Other [Debrief form]	1.1	24 March 2017
Other [Covering letter to REC]	1	24 March 2017
Other [GCP certificate Caroline Reid]	1	24 March 2017
Other [GCP certificate Julia Hannon]	1	24 March 2017
Participant consent form [Consent form]	1	16 February 2017
Participant information sheet (PIS) [PIS]	1.1	24 March 2017
REC Application Form [REC_Form_17022017]		17 February 2017
Research protocol or project proposal [Protocol]	1.1	24 March 2017
Summary CV for Chief Investigator (CI) [CV - Julia Hannon]	1	16 February 2017
Summary CV for student [CV - Caroline Reid]	1	16 February 2017
Summary CV for supervisor (student research) [CV - Angus MacBeth]	1	16 February 2017
Validated questionnaire [Childhood Trauma Questionnaire]	1	22 February 2017
Validated questionnaire [Impact of Events Scale]	1	22 February 2017
Validated questionnaire [Inventory of interpersonal problems]	1	22 February 2017
Validated questionnaire [Positive and negative symptoms scale]	1	22 February 2017
Validated questionnaire [The Singh O'Brien Level of Engagement Scale]	1	22 February 2017
Validated questionnaire [cartoon based mentalization measure - instructions]		22 February 2017
Validated questionnaire [sample picture task 1 - mentalizing measure]		22 February 2017
Validated questionnaire [clinical interview - positive and negative symptoms scale]		22 February 2017

Statement of compliance

The Committee is constituted in accordance with the Governance Arrangements for Research

Ethics Committees and complies fully with the Standard Operating Procedures for Research Ethics Committees in the UK.

After ethical review

Reporting requirements

The attached document *"After ethical review – guidance for researchers"* gives detailed guidance on reporting requirements for studies with a favourable opinion, including:

- Notifying substantial amendments
- Adding new sites and investigators
- Notification of serious breaches of the protocol
- Progress and safety reports
- Notifying the end of the study

The HRA website also provides guidance on these topics, which is updated in the light of changes in reporting requirements or procedures.

User Feedback

The Health Research Authority is continually striving to provide a high quality service to all applicants and sponsors. You are invited to give your view of the service you have received and the application procedure. If you wish to make your views known please use the feedback form available on the HRA website: http://www.hra.nhs.uk/about-the-hra/governance/quality-assurance/

HRA Training

We are pleased to welcome researchers and R&D staff at our training days – see details at http://www.hra.nhs.uk/hra-training/

17/SS/0033	**Please quote this number on all correspondence**

With the Committee's best wishes for the success of this project.

Yours sincerely

Christine Beadle

Mrs Christine Beadle
Vice Chair

Email:sandra.wyllie@nhslothian.scot.nhs.uk

Enclosures: "After ethical review – guidance for researchers"

Copy to: *Ms Charlotte Smith*
Ms Rebecca Whiting, NHS Grampian

South East Scotland REC 01
Waverley Gate
2 - 4 Waterloo Place
Edinburgh
EH1 3EG

Telephone: 0131 465 5473

03 April 2017

Miss Caroline Reid
Trainee Clinical Psychologist
NHS Grampian
Older Adult Psychology Service
Royal Cornhill Hospital
Aberdeen
AB25 2ZH

Dear Miss Reid

Study title: **How does Mentalizing and Interpersonal Functioning relate to adverse life events and service engagement in people who experience psychosis?**
REC reference: **17/SS/0033**
IRAS project ID: **222947**

Thank you for your letter of 31 March 2017. I can confirm the REC has received the documents listed below and that these comply with the approval conditions detailed in our letter dated 31 March 2017

Documents received

The documents received were as follows:

Document	*Version*	*Date*
Other [Clinician referral form]	1.1	31 March 2017

Approved documents

The final list of approved documentation for the study is therefore as follows:

Document	*Version*	*Date*
Copies of advertisement materials for research participants [Poster]	1.1	24 March 2017
GP/consultant information sheets or letters [GP letter]	1	16 February 2017
Other [Debrief form]	1	16 February 2017

Other [CV - Helen Griffiths]	1	16 February 2017
Other [brune et al 2016 paper using mentalizing measure]	1	22 February 2017
Other [Demographic information]	1.1	24 March 2017
Other [Debrief form]	1.1	24 March 2017
Other [Covering letter to REC]	1	24 March 2017
Other [GCP certificate Caroline Reid]	1	24 March 2017
Other [GCP certificate Julia Hannon]	1	24 March 2017
Other [Clinician referral form]	1.1	31 March 2017
Participant consent form [Consent form]	1	16 February 2017
Participant information sheet (PIS) [PIS]	1.1	24 March 2017
REC Application Form [REC_Form_17022017]		17 February 2017
Research protocol or project proposal [Protocol]	1.1	24 March 2017
Summary CV for Chief Investigator (CI) [CV - Julia Hannon]	1	16 February 2017
Summary CV for student [CV - Caroline Reid]	1	16 February 2017
Summary CV for supervisor (student research) [CV - Angus MacBeth]	1	16 February 2017
Validated questionnaire [Childhood Trauma Questionnaire]	1	22 February 2017
Validated questionnaire [Impact of Events Scale]	1	22 February 2017
Validated questionnaire [Inventory of interpersonal problems]	1	22 February 2017
Validated questionnaire [Positive and negative symptoms scale]	1	22 February 2017
Validated questionnaire [The Singh O'Brien Level of Engagement Scale]	1	22 February 2017
Validated questionnaire [cartoon based mentalization measure - instructions]		22 February 2017
Validated questionnaire [sample picture task 1 - mentalizing measure]		22 February 2017
Validated questionnaire [clinical interview - positive and negative symptoms scale]		22 February 2017

You should ensure that the sponsor has a copy of the final documentation for the study. It is the sponsor's responsibility to ensure that the documentation is made available to R&D offices at all participating sites.

17/SS/0033	**Please quote this number on all correspondence**

Yours sincerely

Sandra Wyllie
REC Manager

E-mail: sandra.wyllie@nhslothian.scot.nhs.uk

Copy to: *Ms Charlotte Smith*
Ms Rebecca Whiting, NHS Grampian

Lothian NHS Board

South East Scotland Research Ethics Committee 01

Waverley Gate
2-4 Waterloo Place
Edinburgh
EH1 3EG
Telephone 0131 536 9000

www.nhslothian.scot.nhs.uk

03 May 2017

Miss Caroline Reid
Trainee Clinical Psychologist
NHS Grampian
Older Adult Psychology Service
Royal Cornhill Hospital
Aberdeen
AB25 2ZH

Date 03 May 2017
Your Ref
Our Ref

Enquiries to: Sandra Wyllie
Extension: 35473
Direct Line: 0131 465 5473
Email: Sandra.Wyllie@nhslothian.scot.nhs.uk

Dear Miss Reid

Study title: **How does Mentalizing and Interpersonal Functioning relate to adverse life events and service engagement in people who experience psychosis?**
REC reference: **17/SS/0033**
Amendment number: **17/SS/0033/AM01**
Amendment date: **28 April 2017**
IRAS project ID: **222947**

The above amendment was reviewed by the Sub-Committee in correspondence.

Ethical opinion

The members of the Committee taking part in the review gave a favourable ethical opinion of the amendment on the basis described in the notice of amendment form and supporting documentation.

The Committee had no ethical concerns regarding this amendment.

Approved documents

The documents reviewed and approved at the meeting were:

Document	*Version*	*Date*
Notice of Substantial Amendment (non-CTIMP)		28 April 2017
Participant information sheet (PIS)	Version 3	26 April 2017
Research protocol or project proposal	Version 3	26 April 2017
Validated questionnaire [RFQ46]		22 August 2016

Membership of the Committee

The members of the Committee who took part in the review are listed on the attached sheet.

NHS
Lothian

Working with NHS Care Organisations

Sponsors should ensure that they notify the R&D office for the relevant NHS care organisation of this amendment in line with the terms detailed in the categorisation email issued by the lead nation for the study.

Statement of compliance

The Committee is constituted in accordance with the Governance Arrangements for Research Ethics Committees and complies fully with the Standard Operating Procedures for Research Ethics Committees in the UK.

We are pleased to welcome researchers and R & D staff at our Research Ethics Committee members' training days – see details at http://www.hra.nhs.uk/hra-training/

17/SS/0033:	**Please quote this number on all correspondence**

Yours sincerely

Christine Beadle

Mrs Christine Beadle
Vice Chair

E-mail: sandra.wyllie@nhslothian.scot.nhs.uk

Enclosures: *List of names and professions of members who took part in the review*

Copy to: *Ms Rebecca Whiting, NHS Grampian*
Ms Charlotte Smith

South East Scotland REC 01

Attendance at Sub-Committee of the REC

Committee Members:

Name	*Profession*	*Present*	*Notes*
Mrs Christine Beadle	Research Nurse	Yes	Chair
Mr Ben Bullen	Acute Diabetes Specialist Podiatrist	Yes	
Dr Sara Smith	Senior Lecturer-Dietetics	Yes	
Professor Jill Stavert	Professor (Law) and Director, Centre for Mental Health and Incapacity Law, Rights and Policy	Yes	

Also in attendance:

Name	*Position (or reason for attending)*
Mrs Sandra Wyllie	REC Manager

Miss Caroline Reid
Trainee Clinical Psychologist
NHS Grampian
Older Adult Psychology Service
Royal Cornhill Hospital
Aberdeen
AB25 2ZH

R&D Department
Corporate Services Building
Monklands Hospital
Monkscourt Avenue
AIRDRIE
ML6 0JS

Date 12.04.2017
Enquiries to Elizabeth McGonigal,
Senior R&D Facilitator
Direct Line 01236 712459
Email elizabeth.mcgonigal@lanarkshire.scot.nhs.uk

Dear Miss Reid

Project title: How does Mentalizing and Interpersonal Functioning relate to adverse life events and service engagement in people who experience psychosis?

R&D ID: L17020

NRS ID Number: NRS17/222947

I am writing to you as Chief Investigator of the above study to advise that R&D Management approval has been granted for the conduct of your study within NHS Lanarkshire.

NAME	TITLE	ROLE
Miss Julia Hannon	Trainee Clinical Psychologist	Principal Investigator

For the study to be carried out you are subject to the following conditions:

Conditions

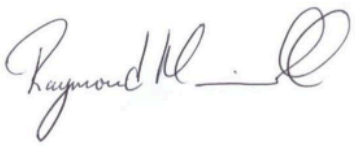
- You are required to comply with Good Clinical Practice, Ethics Guidelines, Health & Safety Act 1999 and the Data Protection Act 1998.
- The research is carried out in accordance with the Scottish Executive's Research Governance Framework for Health and Community Care (copy available via the Chief Scientist Office website: http://www.cso.scot.nhs.uk/ or the Research & Development Intranet site: http://firstport2/staff-support/research-and-development/default.aspx

Cont...

- You must ensure that all confidential information is maintained in secure storage. You are further obligated under this agreement to report to the NHS Lanarkshire Data Protection Office and the Research & Development Office infringements, either by accident or otherwise, which constitutes a breach of confidentiality.
- Clinical trial agreements (if applicable), or any other agreements in relation to the study, have been signed off by all relevant signatories.
- You must contact the Lead Nation Coordinating Centre if/when the project is subject to any minor or substantial amendments so that these can be appropriately assessed, and approved, where necessary.
- You notify the R&D Department if any additional researchers become involved in the project within NHS Lanarkshire
- You notify the R&D Department when you have completed your research, or if you decide to terminate it prematurely.
- You must send brief annual reports followed by a final report and summary to the R&D office in hard copy and electronic formats as well as any publications.
- If the research involves any investigators who are not employed by NHS Lanarkshire, but who will be dealing with NHS Lanarkshire patients, there may be a requirement for an SCRO check and occupational health assessment. If this is the case then please contact the R&D Department to make arrangements for this to be undertaken and an honorary contract issued.

I trust these conditions are acceptable to you.

Yours sincerely,



Raymond Hamill – Corporate R&D Manager

cc.

NAME	TITLE	CONTACT ADDRESS	ROLE
Julia Hannon	Trainee Clinical Psychologist	Julia.Hannon@nhs.net	Principal Investigator
Charlotte Smith		Charlotte.smith@ed.ac.uk	Sponsor Contact
Dr Alison Campbell	Consultant Clinical Psychologist	Alison.Campbell@lanarkshire.scot.nhs.uk	Field Supervisor
Dr Angus MacBeth		angus.macbeth@nhs.net	Academic Supervisor
Dr Helen Griffiths		helen.griffiths@ed.ac.uk	Academic Supervisor