Doctoral Thesis

Submitted in partial fulfilment of the Lancaster University Doctorate in Clinical Psychology

Exploring Mental Imagery in Psychosis: Systematic Review and Lessons learned from a Pilot Study Intervention for Suicidal Ideation

Doctorate in Clinical Psychology

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Statement of Total Word Count

Section	Main text	Appendices including References, Figures and Table	Total
Thesis Abstract	291	0	291
Literature Review	6292	15,397	21689
Research Paper	6030	7,925	13955
Critical Appraisal	3823	1101	4924
Total	16,115	24,423	40,538

Thesis Abstract

This thesis explores the role of mental imagery in psychosis, encompassing both a systematic review and a pilot feasibility study.

Section One presents a systematic review aimed at exploring the relationship between mental imagery and psychosis. A comprehensive search of four academic databases was conducted, utilising keywords related to mental imagery and psychosis. The review highlights that mental imagery appears to be altered in people with psychosis. Results suggested that the apparent alterations in mental imagery may influence symptomology, but the relationship requires further investigation.

Section Two details a pilot feasibility study exploring the application of a positive mental imagery intervention targeting suicidal ideation in a small sample of individuals with psychosis who were also experiencing suicidal thoughts. Due to recruitment barriers, the study shifted its focus to lessons learned about conducting research within this population group. Results showed that participants enjoyed the intervention and rated the intervention as acceptable and feasible. However, the results are inconclusive due to the low sample size and attrition rate. Apparent adaptations that were helpful within the study are discussed. It is recommended that a more extensive feasibility study should be explored in further research to determine the acceptability and feasibility of this approach.

Section Three critically appraises the research process, reflecting on the methodological decisions, challenges faced, and implications of the findings for clinical practice and future research.

Declaration

This thesis contains research undertaken for the Doctorate in Clinical Psychology at the Division for Health Research, Lancaster University. The work presented here is the author's own, except where due reference is made. This work has not been submitted for any other academic award.

Name: Claudia Daley

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Date: 30/Aug/2024

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Finally, I would like to dedicate this work to the memory of my Aunty, whom I lost while writing this thesis and miss every day. Her love, kindness, and texts telling me to take it one day at a time helped me continue on this journey.

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Paper One: Systematic Literature Review

A systematic review exploring the relationship between mental imagery and psychosis.

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Abstract: 291

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1. Abstract

Background

Mental imagery can be defined as sensory information from an individual's memory, resulting in re-experiencing a version of the original stimulus or novel stimuli in the mind's eye. The review explored the relationship between mental imagery and psychosis by examining imagery vividness, controllability, symptomology, and other aspects of imagery in individuals with psychosis. Mental imagery has been linked to both the onset and maintenance of symptoms in individuals with psychosis. By examining aspects such as imagery vividness, controllability, and its association with symptomology, this review aims to provide a clearer understanding of the role mental imagery plays in psychosis. This understanding may help to contribute to the development of tailored interventions for individuals with psychosis.

Methods

PsycINFO, MEDLINE, Embase and CINAHL were systematically searched for peer-reviewed reports examining primary data concerning mental imagery in individuals with psychosis. Papers were quality appraised using the JBI Critical Appraisal Checklist for Analytical Cross-Sectional Studies. The review protocol was pre-registered on PROSPERO (CRD42023480987).

Results

Of the 1336 reports identified, 24 were eligible for inclusion. Results suggested that individuals with psychosis experience an alteration in mental imagery. Findings showed consistent deficits in object imagery, whilst reports on spatial imagery were varied. There were inconsistent results on imagery vividness, which was reported as enhanced or reduced in this population group. Results suggested that the apparent alterations in mental imagery may influence symptomology such as hallucinations, but the relationship requires further investigation.

Conclusions

This review demonstrates a plethora of research which suggests that individuals with psychosis experience altered mental imagery in comparison to healthy controls. However, discrepancies between the findings of the literature and the methods of the studies should be considered. Future high-quality research, with larger sample sizes, is required to draw absolute conclusions.

Keywords: mental imagery, psychotic disorders, psychosis, schizophrenia, hallucinations

2. Introduction

Mental imagery has been defined as sensory information from an individual's memory, resulting in re-experiencing a version of the original stimulus or novel stimuli in the "mind's eye" (Pearson et al., 2015). Mental imagery is a broad term that encompasses multiple forms of imagery that map onto the five senses: auditory, visual, olfactory, gustatory, and tactile. It is pivotal in shaping an individual's perception, and its influence has been explored across multiple aspects, including cognition, memory, and emotions (Kosslyn, 1994). Some evidence suggests that mental imagery provokes stronger emotions in individuals than verbal representations (Pearson et al., 2015).

Literature has often explored mental imagery in terms of its vividness and controllability. If an individual has high imagery vividness, they can create an image of greater robustness, meaning that mental pictures are more lifelike and immersive (Friedlander et al., 2022). Imagery controllability refers to how an individual can manipulate or alter an image (Di Corrado et al., 2019) and can be explored in terms of spatial imagery. Spatial imagery refers to "the inspection and evaluation of spatial features (e.g., distance, relative position, configuration) and the spatial manipulation (e.g., rotation, shifting, reorienting) of mentally generated visual images" (Sack et al., 2012).

Mental imagery is central to psychological difficulties (Hackmann & Holmes, 2004) as it strongly impacts emotion (Holmes et al., 2008; 2009; Holmes & Mathews, 2010). There is evidence that it influences the onset and maintenance of depression (Weßlau & Steil, 2014), psychosis (D'Argembeau et al., 2008), post-traumatic stress disorder (PTSD; Holmes et al., 2005), social phobia (Hackmann et al., 2000) and extreme mood states (Berg et al., 2023). As mental imagery is closely intertwined with an individual's memories and imagining of the future (Pearson et al., 2013), individuals can exhibit intrusive images known as "flashbacks", which occur in psychological difficulties such as PTSD, anxiety, depression, eating difficulties and psychosis (Brewin et al., 2010).

Mental imagery can aid in understanding the underlying cognitive mechanisms of psychological disorders (Pearson et al., 2013) and play an essential part in an individual's treatment plan (Pearson et al., 2015). Several frameworks support the implementation of mental imagery in psychological therapies. For example, in cognitive behavioural therapy (CBT), imagery can function as an "emotional amplifier" (Holmes & Mathews, 2010), meaning that an image produced in one's mind can lead to intensified emotional responses. Additionally, in psychodynamic therapy, mental imagery is utilised to uncover unconscious

thoughts and feelings which help individuals to gain insight (Bauckhage & Sell, 2021) and within mindfulness practices, imagery impacts cognitive and emotional states (Bigham, 2014).

There has been increasing interest in exploring the role of mental imagery within individuals with psychosis (Auvinen-Lintunen et al., 2021; Wagner & Monzel, 2023; Laing et al., 2016). Psychosis can be defined as a clinical construct characterised by several symptoms, with core symptoms being delusions, hallucinations and thought disorders (Gaebel & Zielasek, 2015). Psychosis has been associated with increased mental imagery (Königsmark et al., 2021; Sack et al., 2005; Shine et al., 2015), as well as a more significant inability to generate mental imagery or separate this from sensory perception (Ji et al., 2019). Mental imagery plays a crucial role in individuals' symptomatology, with intrusive mental images possibly maintaining factors for persecutory delusions (Taylor et al., 2020). However, some studies have suggested that individuals with psychosis experience no differences in imagery in comparison to healthy controls (Auvinen-Litunen et al., 2021).

Multiple hypotheses have been put forward to explain why individuals diagnosed with psychosis may exhibit differences in mental imagery. Cognitive theories highlight that distorted perception and misinterpretation of internal stimuli may lead to individuals experiencing hallucinations (Horowitz, 1975). Researchers also suggest that individuals diagnosed with psychosis have impaired reality monitoring (Garrison et al., 2017). Reality monitoring can be defined as the ability to differentiate between internally and externally generated information (Johnson & Raye, 1981). This means individuals living with psychosis may misinterpret internal images as if they are coming from external sources within their perceptual system (Sack et al., 2005). Individual studies have investigated the relationship between psychosis and mental imagery. However, to the author’s knowledge, there is no systematic review of the topic. A comprehensive review of studies would help facilitate an understanding of the relationship between mental imagery and psychosis. In addition, although imagery seems to be a potentially helpful therapeutic avenue, findings need to be accounted for that show no differences in mental imagery between individuals with psychosis and control groups.

Exploring mental imagery in psychosis is essential to increase knowledge of the cognitive and neural mechanisms underlying these symptoms. An excellent understanding of this area will be necessary to develop effective and tailored clinical interventions (Blackwell, 2019). This review's main aim was to explore the relationship between mental imagery and

psychosis. It aimed to examine imagery vividness, controllability, and other domains of imagery in individuals with psychosis.

3. Method

3.1 Review Protocol and Registration.

The review was written according to the Preferred Reporting Items for Systematic Review and Meta-Analyses (PRISMA) statement (Liberati et al., 2009). The review protocol was pre-registered on PROSPERO (CRD42023480987).

3.2 Eligibility Criteria

To be included, studies had to include individuals who had a diagnosis of a psychotic disorder by the Diagnostic and Statistical Manual (DSM) or International Statistical Classification of Diseases and Related Health Problems (ICD). The study also had to be a quantitative or mixed-method study, published in a peer-reviewed journal with specific reference to psychosis and mental imagery. Mental imagery for this review was defined as "the simulation or re-creation of perceptual experience across sensory modalities" (Kosslyn et al., 2001; Pearson, 2007). Studies were excluded if individuals had organic psychosis, neurological conditions, brain injury, or primary alcohol/substance use difficulty. Additionally, studies were excluded if they focused on motor imagery, therapy intervention studies, no healthy control group present or had reference to autobiographical memories without explicitly exploring imagery components.

3.3 Search Strategy

On November 14, 2023, PsycINFO, MEDLINE, Embase, and CINAHL were accessed. The search was updated in February of 2024 to identify any papers published after the initial search, and one paper was identified and included in the review. Google Scholar also identified further literature through forward and backward citation searches. Initial search terms were developed by defining concepts from the literature and utilising tools such as thesaurus terms (PsycINFO) and MeSH headings (MEDLINE). Please see Table 1-1 for terms and keywords utilised. The references were imported into Mendeley, where duplicates were removed. Two reviewers Claudia Daley (CD), a trainee clinical psychologist and Emily Bispham (EB), a research assistant external to the research team, screened titles and abstracts from the search following the preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines against the review's inclusion and exclusion criteria. The kappa coefficient for this review was 0.75. According to Altman's (1991) guidelines, this indicates good agreement between reviewers. The articles that met the inclusion criteria from

their title and abstract were screened in full text for their eligibility. Any disagreements between reviewers were discussed until a consensus was reached. If reviewers could not agree, a third author (JPC) was consulted.

3.4 Data Extraction Process

The papers that met the inclusion criteria were imported into an Excel document. Data were extracted for title, author, year of study, study design, study aims, methods, findings, limitations, sample size, participant demographics, measure of imagery, and type of imagery focus (See Table 1-2 for summary). Due to the diverse range of measures utilised across studies, which focus on different aspects of imagery (indicated by Table 1-3) and varying sample characteristics meant significant heterogeneity between studies. Therefore, it was concluded a meta-analysis would not be appropriate, as conducting a meta-analysis with this level of heterogeneity can lead to true effects being obscured and meaningless results (Lee, 2019). The research was evaluated through a narrative synthesis to present differences, similarities, and associations across the literature. Data were categorised into four themes, dependent on the focus of imagery in the study. These were imagery vividness, spatial imagery, object imagery and the relationship between imagery and symptomology.

3.5 Critical Appraisal Checklist

All studies were assessed for quality using the JBI Critical Appraisal Checklist for Analytical Cross-Sectional Studies (JBI-MaStari; Joanna Briggs Institute, 2017). Please see Appendix 1-A. This tool is approved to evaluate the risk of bias and the methodological quality of cross-sectional studies (Munn et al., 2020). It includes eight items that assess the studies' reliability and validity. To increase the quality appraisal's reliability, 30% of papers were independently rated by another researcher (EB). The checklist questions were answered with yes, no, or unclear. Yes, was summed as 1 point; unclear was equal to 0.5 points, and no was marked as 0. For this study, 7-8 points were classed as high quality, 5-6 points as moderate quality, and 3-4 points as low quality. The clinical supervisor (JPC) resolved any disputes. The collective strengths and weaknesses of the records were examined to identify patterns, such as common methodological flaws or areas where the research is predominantly strong.

4. Results

4.1 Study Selection

The database search identified 1855 records. After removing 519 duplicates, 1336 titles and abstracts were screened. 1280 records were excluded for failing to meet the inclusion

criteria. 56 articles were read in full to determine eligibility further. Out of these, 2 articles met the inclusion criteria for the study. Three additional articles were identified through forward and backward searches. A total of 24 articles were included in the review. Refer to Figure 1-1 for the PRISMA flow diagram on selecting and excluding studies. The review was written per PRISMA guidance (Page et al., 2021).

4.2 Study and participants' characteristics.

See Table 1-2 for participants' characteristics. The 24 studies were published from 1972-2024. 15 of these were conducted in Europe, five studies in the USA, three in Iran, and one in India. Most studies occurred in the UK (n = 7). Across studies, all individuals were diagnosed with psychotic disorders such as schizophrenia (n = 811), schizoaffective disorder (n = 22) and first-episode psychosis (n = 12). The majority of participants with psychotic disorders were taking antipsychotic medication (n = 629). Six studies did not specify whether participants were taking medication. The measure of imagery varied considerably across studies. All studies utilised a cross-sectional study design. The search identified no longitudinal research. The total overall sample size for individuals diagnosed with a psychotic disorder was 845. The total sample size for healthy controls was 698.

4.3 Quality Appraisal

12 studies were rated high quality, ten were rated medium quality, and two were rated low quality. The scores from the quality appraisal ranged from 4.5-7.00 out of a possible 8. The main reasons for reduced quality were the confounding variables not being addressed or identified and whether imagery had been measured reliably and validly throughout studies. Table 1-4 provides further information on the quality appraisal of included studies.

4.4 Imagery Vividness

Six studies within the review investigated imagery vividness in individuals diagnosed with psychosis (Alle et al., 2020; Böcker et al., 2000; Matthews et al., 2014; Oertel et al., 2009; Pillny et al., 2024; Sack et al., 2005). Imagery vividness is often measured through subjective and objective measures. Four studies utilised subjective measures, primarily self-report measures, asking individuals to form mental images and rate their imagery experience. (Matthews et al., 2014; Oertel et al., 2009; Pillny et al., 2024; Sack et al., 2005). Two studies utilised objective measures that employed tests that required imagery for their solution (Alle et al., 2020; Böcker et al., 2000).

Three reports found that individuals diagnosed with psychosis experience enhanced vividness in imagery (Böcker et al., 2000; Oertel et al., 2009; Sack et al., 2005). Oertel et al.

(2009) conducted a cross-sectional comparison study with 52 individuals diagnosed with psychosis, 44 of their first-degree relatives and two healthy control groups. Utilising self-report measures, cognitive-perceptual tests, and psychometric assessments, they found that individuals diagnosed with psychosis, their first-degree relatives, and individuals with high "schizotypy traits" experience enhanced vividness in visual imagery compared to healthy controls. It was suggested that vividness of mental imagery could be an independent symptom and a trait marker for individuals who are diagnosed with psychosis. Sack et al. (2005) extended this claim with 50 individuals diagnosed with psychosis using the self-report measure, "Questionnaire Upon Mental Imagery" (QMI: Sheehan, 1967). It was found that individuals diagnosed with psychosis have a higher level of imagery vividness across all sensory modalities in comparison to healthy controls. Finally, Böcker et al. (2000) implemented objective tests to assess the vividness of imagery, including 22 triads of line drawings (Mehta et al., 1992) in a small sample size of 13 individuals diagnosed with psychosis who experienced hallucinations and 19 individuals diagnosed with psychosis who did not experience hallucinations. The study found that for individuals with auditory hallucinations, the vividness of auditory imagery was relatively higher than that of visual imagery. This difference highlights a potential link between vivid auditory imagery and auditory hallucinations. It must be considered that 'The Line-drawing Measure' (Mehta et al., 1992) was previously created to measure a specific deficit in one service user (Böcker et al., 2000). It is uncertain how applicable this measure is to other population groups, such as individuals diagnosed with psychosis. The limited information on the reliability and validity of this measure means that interpreting the results of this study is challenging.

Three articles within the review showed contrary findings (Alle et al., 2020; Matthews et al., 2014; Pillny et al., 2024). Alle et al. (2020) used a new paradigm with 28 individuals diagnosed with psychosis and 28 matched healthy controls to examine the effects of sensory imagery manipulation. It was found that individuals diagnosed with psychosis rated memories lower on overall vividness in comparison to healthy controls. Similarly, Pillny et al. (2024), used The Vividness of Visual Imagery Questionnaire (VVIQ; Marks 1973) with 43 individuals with psychosis spectrum disorders, found that mental imagery vividness is reduced in individuals with psychotic disorders. Conversely, Matthews et al. (2014) conducted mental imagery generation and inspection tasks, as well as self-report measures such as the VVIQ (Marks, 1973), with 15-16 individuals diagnosed with psychosis and 15 healthy controls. It was found that there was no difference in the vividness of imagery

between individuals who were diagnosed with psychosis and the control group. This difference in findings may be due to the employment of psychometric scales that measure different aspects of mental imagery. The VVIQ (Marks, 1973) measures the subjective vividness or clarity of an individual's mental imagery, whilst the QMI (Sheehan, 1967) assesses various aspects of mental imagery, including frequency, generation, and control. It should be noted that the small sample size of Matthews et al. (2014) could make the study more prone to bias.

4.5 Spatial Imagery

Nine studies within this review explored spatial imagery in individuals diagnosed with psychosis (Aleman et al., 2005; Ba et al., 2022; Benson & Park, 2013; Chandiramani & Varma, 1987; Matthews et al., 2014; Mazhari et al., 2014; 2015; 2016; Rafford et al., 2010). One of the most widely utilised methods to measure spatial imagery is the Mental Rotation Task (Shepard & Metzler, 1971). Mental rotation is the capability to envision how an object would exist if it were rotated from its original position (Johnson & Moore, 2020). Mental rotation tasks can indirectly provide information about the spatial aspects of mental imagery. These tasks include individuals mentally rotating objects, and the speed and accuracy of these tasks may relate to their vividness and ability to manipulate mental imagery (Shepard & Metzler, 1971). Self-report measures were used to measure spatial imagery, for example, the Object-Spatial Imagery Questionnaire (OSIQ; Blajkenkova et al., 2006), which consists of a spatial imagery scale to measure spatial relations and transformations.

Four articles within this review used mental rotation tasks to shed light on the nature of spatial imagery abilities (Ba et al., 2022; Mazhari et al., 2014; 2015; 2016). All studies used a cross-sectional design and compared individuals diagnosed with psychosis to healthy control groups. They found individuals diagnosed with psychosis show less precision and take more time on the mental rotation tasks in comparison to controls, concluding that individuals diagnosed with psychosis have a deficit in mental spatial imagery (Mazhari et al., 2014; Mazhari et al., 2015; Mazhari et al., 2016; Ba et al., 2022). Two articles found further evidence for mental rotation being a multi-layered concept that could be indicative of psychosis (Mazhari et al., 2014; 2015). The papers argue that mental rotation could help explore the genetic effects and cognitive functioning within this population group (Mazhari et al., 2015).

Additionally, utilising a different methodology, Rafford et al. (2010), in a cross-sectional comparison study with 24 individuals diagnosed with psychosis and 25 healthy

controls, asked individuals to explain their mental representations of scenes they had visited in as much detail as possible, as well as new experiences. Researchers found that individuals diagnosed with psychosis had difficulties imagining rich scenarios and developing overall content compared to the healthy control group, which implied that individuals diagnosed with psychosis hold a deficit in spatial imagery.

In contrast, other research indicates that individuals with psychosis may have spared, or even enhanced performance spatial imagery compared to healthy controls (Aleman et al., 2005; Chandiramni & Varma, 1987; Benson & Park, 2013; Matthews et al., 2014). Aleman et al. (2005), in a cross-sectional comparison study, used numerous behavioural measures of auditory and visual mental imagery measures and found there was no significant difference between the spatial imagery ability of individuals diagnosed with psychosis and healthy controls. Similarly, Chandiramani & Varma (1987) compared spatial imagery between 20 individuals diagnosed with psychosis who experienced hallucinations, 20 individuals diagnosed with psychosis who did not experience hallucinations and 20 healthy control participants. This study utilised the QMI (Betts, 1909) and Gordon's (1949) test of the control of visual imagery. It was concluded that the controllability of visual imagery did not differ between individuals diagnosed with psychosis who experience hallucinations, those who don't, and healthy controls.

Moreover, research has shown that individuals diagnosed with psychosis show enhanced visuospatial imagery (Benson & Park, 2013; Matthew et al., 2013). Benson & Park (2013) explored the association between visuospatial mental imagery and spatial working memory in individuals diagnosed with psychosis compared to healthy controls. Researchers utilised visuospatial tasks such as the Paper Folding Test (PFT) (Ekstrom et al., 1976) and the Jigsaw Puzzle Task (JPT) (Richardson & Vecchi, 2002). Participants were required to visualise objects and reconstruct puzzles of those objects. Individuals diagnosed with psychosis showed intact visuospatial intelligence, as well as enhanced mental imagery manipulation, in comparison to healthy controls.

Furthermore, Matthews et al. (2014) explored visuospatial mental imagery and spatial working memory performance in individuals diagnosed with psychosis compared to healthy controls, utilising spatial working memory tasks and the VVIQ (Marks, 1973). It was found that individuals diagnosed with psychosis have enhanced visuospatial mental imagery and spatial working memory performance compared to healthy controls.

4.6 Object imagery

Three studies in this review explored object imagery within individuals diagnosed with psychosis (Aleman, 2005; Ba et al., 2022; Doniger, 2001). All studies were cross-sectional and employed viewer or object recognition tasks. Object imagery is the ability to form illustrative images of objects (Vannucci et al., 2008). It is usually measured by self-report questionnaires such as The Object-Spatial Imagery Questionnaire (OSIQ) (Blajenkova et al., 2006), as well as object recognition tasks (Smithson et al., 2023). Ba et al. (2022) tested the ability of object imagery in individuals at different stages of psychosis. This included four groups: individuals who are at a high risk of developing psychosis, first-episode psychosis individuals, individuals diagnosed with chronic psychosis, as well as a healthy control comparison group. Participants were asked to perform a viewer mental rotation task and an object mental rotation task. Individuals diagnosed with chronic psychosis had more significant deficits in the object recognition task in comparison to the other groups. It was found that an individual's ability of object recognition may differ across the lifespan of individuals diagnosed with psychosis.

In addition, Doniger (2001) examined 26 individuals diagnosed with psychosis and 23 healthy controls to explore object recognition. Researchers utilised object recognition tasks with line drawings, word prompting and pictures. Individuals diagnosed with psychosis showed a significant deficit in object recognition. Interestingly, researchers found that individuals diagnosed with psychosis benefited as much as healthy control individuals from previous exposure to complete pictures and word prompting. Similarly, Aleman et al. (2005) conducted a comparative study with 44 individuals diagnosed with psychosis and 20 healthy control participants. Participants were asked to complete a task of object visual mental imagery. They found that individuals diagnosed with psychosis showed a deficit in the object imagery task compared to the healthy controls. It was concluded that there may be a dysfunction of systems mediating objects and spatial visual mental imagery in individuals diagnosed with psychosis.

4.7 Imagery and Symptomology

Twelve studies explored the relationship between imagery and symptomology in individuals diagnosed with psychosis (Aleman et al., 2003; Bentall et al., 1991; Böcker et al., 2000; Brébion et al., 1996, 2008, 2011; David & Cutting, 1992; Huddy et al., 2016; Malcolm et al., 2015; Mintz & Alpert, 1972; Oertel et al., 2009; Sack et al., 2005). Self-report questionnaires, clinical interviews such as The Positive and Negative Syndrome Scale

(PANSS; Kay et al., 1987) and behavioural tasks (imagery generation tasks) can be used to measure the relationship between mental imagery and symptomology. The relationship between reality monitoring and symptomology in individuals with psychosis has also been explored. This is accomplished using a variety of experimental paradigms to evaluate individuals' ability to distinguish between actual and imagined experiences.

One study explored involuntary imagery (Malcom, 2015). Malcolm (2015) asked 30 individuals diagnosed with psychosis and 27 healthy controls to complete measures of non-affective use of imagery as well as prospective imagery. Involuntary imagery was found to be altered within this population group, and prospective imagery was associated with anxiety and posttraumatic intrusions. It was highlighted that individuals diagnosed with psychosis may have an underlying deficit in integrating contextual information, which could leave individuals susceptible to experiencing multiple intrusive images about the past and future.

Nine studies within this review focused on investigating the relationship between hallucinations and imagery. This research has typically employed three separate groups within studies: individuals diagnosed with psychosis who experience hallucinations, who do not experience hallucinations, and a healthy control group. (Aleman, 2003; Bentall, 1991; Böcker, 2000; Brébion et al., 2008; Brébion et al., 2011; Chandiramani & Varma, 1987; David & Cutting, 1992; Oertel et al., 2009; Sack et al., 2005).

It has been suggested that hallucinations are formed due to vivid mental images not being perceived as self-generated (Bentall et al., 1991). Bentall et al. (1991) conducted a cross-sectional comparative study with 22 individuals diagnosed with psychosis who experienced hallucinations, 16 individuals diagnosed with psychosis who did not experience hallucinations and 22 healthy control individuals. A reality-monitoring task was administered to all participants. Individuals diagnosed with psychosis were less accurate in recognising the source of items in comparison to healthy individuals. Further to this, individuals who were diagnosed with psychosis and experienced hallucinations were more likely to misattribute self-generated items. The results were interpreted as consistent with the theory of hallucinations being self-generated events misattributed to an external source.

Additionally, three further studies have found individuals diagnosed with psychosis have impaired reality discrimination, which is associated with visual hallucinations (Brébion et al., 2008; Brébion et al., 1977), as well as auditory hallucinations (Böcker et al., 2000). Brébion et al. (2008) conducted a cross-sectional comparative study that employed a reality monitoring task to investigate the association between visual hallucinations and reality

monitoring deficit in 41 individuals who had been diagnosed with psychosis and 43 healthy control participants. Individuals with visual hallucinations demonstrated a different pattern of recognition accuracy in comparison to healthy controls. It was concluded that visual hallucinations are associated with a misunderstanding between visual mental images and perception. Brébion et al. (1997), also using a cross-sectional comparison study, utilised a reality monitoring task with 31 individuals diagnosed with psychosis and 31 healthy controls. They found that individuals diagnosed with psychosis were impaired in discriminating the modality (auditory versus visual). This was found to be correlated with positive symptomatology in individuals diagnosed with psychosis. Additionally, as previously described, Böcker et al. (2000) employed a realty discrimination category-association task (Harvey 1985; Morrison & Haddock 1997) and found the severity of mental imagery vividness to increase with more significant impairments in reality discrimination.

Two papers confirmed that individuals diagnosed with psychosis who experience hallucinations have a higher level of imagery vividness in the auditory modality in comparison to those without hallucinations (Böcker et al., 2000; Mintz & Alpert, 1972). Mintz & Alpert (1972) utilised three groups: 20 individuals diagnosed with psychosis who were experiencing hallucinations, 20 individuals diagnosed with psychosis who were not experiencing hallucinations, and 20 healthy individuals. Participants took part in the vividness of imagery task, where participants were instructed to imagine hearing a recording of 'White Christmas'. It was found that individuals with auditory hallucinations tended to have a high vividness of auditory imagery, while those without auditory hallucinations had a low vividness of imagery. Similarly, this was confirmed by Böcker et al. (2000), who conducted a cross-sectional study with 13 individuals diagnosed with psychosis experiencing hallucinations, 19 individuals diagnosed with psychosis not experiencing hallucinations, and 14 healthy control participants. Auditory and visual tests revealed that the level of the vividness of mental images was higher in the auditory modality than in the visual modality. Therefore, this led to the conclusion that hallucinations may result from an increased vividness of mental imagery (Böcker, 2000).

Furthermore, David & Cutting (1992) asked participants to judge whether the images shown were bigger or smaller than a cat. This required participants to use visual imagery and spatial processing. This study found that individuals diagnosed with psychosis did not display difficulties in visual imagery, just in tasks that required them to understand the meaning of visual information. The study suggested that there might be a connection between the ability

to understand visual information and the occurrence of visual hallucinations in individuals living with psychosis. However, other research has not found a relationship between mental imagery and symptomology. Brébion et al. (2011) aimed to investigate the association between visual hallucinations and psychosis with 41 individuals who had been diagnosed with psychosis and 43 healthy controls who underwent a visual memory task. No association between auditory hallucinations and imagery vividness were found. Additionally, other research has shown no relationship between individuals who experience hallucinations and the vividness of imagery scores (Chandirami & Varma, 1987; Oertel et al., 2009; Sack et al., 2005). Research has concluded that enhanced vividness of mental imagery is independent of the severity of positive or negative symptoms presented within individuals diagnosed with psychosis (Aleman, 2003; Oertel et al., 2009; Sack et al., 2005). Negative symptoms can be defined as the lessening or absence of expected behaviours, such as reduced motivation and social withdrawal (Courrell et al., 2020), whilst positive symptoms are known as delusions and hallucinations (Ruiz-Castaneda et al., 2022). Aleman (2003) explored reality monitoring using a comparison study and employed numerous behavioural auditory and visual imagery measures. Comparisons were made between the abilities of 22 individuals diagnosed with psychosis and 35 individuals in a healthy control group. No differences were discovered in mental imagery measures nor in reality monitoring accuracy between participants.

Three studies explored the relationship between negative symptoms and imagery. Matthews et al. (2014) found a negative association between negative symptoms and the overall richness of imagined scenes in individuals diagnosed with psychosis. Similarly, Doniger (2011) investigated object recognition and found a significant correlation between impaired performance and the severity of negative symptoms in individuals who have been diagnosed with psychosis. Further to this, Huddy et al. (2016), using a cross-comparative study with 30 individuals with a diagnosis of psychosis and 24 healthy controls, administered a mental simulation task which asked participants to generate detailed narratives of everyday scenarios. Individuals with psychosis tended to estimate they would have poorer performance and felt more distress when imagining everyday situations, especially compared to healthy controls. These lower expectations were associated with less experience in similar situations, along with heightened negative symptoms and increased social withdrawal. This study concluded that individuals with psychosis can struggle with mental simulation.

5. Discussion

This review aimed to identify the relationship between mental imagery and psychosis by examining imagery vividness, controllability, and the relationship between imagery and symptomology in individuals with psychotic disorders. Twenty-four papers were included. Below is a summary of findings from each theme. Overall, the findings suggest that people with psychosis experience an alteration in mental imagery. Inconsistent evidence was discovered on whether imagery vividness is enhanced or reduced in this group. Findings show consistent deficits in object imagery, whilst findings on spatial imagery are inconsistent. The research suggests that the apparent alterations in mental imagery may influence symptomology, particularly hallucinations, but the relationship requires further investigation.

5.1 Imagery vividness

Several reports found that individuals diagnosed with psychosis experience enhanced imagery vividness (Böcker et al., 2000; Oertel et al., 2009; Sack, 2005), whilst others claimed that individuals diagnosed with psychosis have less vivid imagery (Alle et al., 2020; Pillny et al., 2024) or do not differ in the vividness of imagery in comparison to healthy controls (Matthews, 2014). These discrepancies could be attributed to methodological variations. Different psychometric scales were utilised, such as the QMI (Sheehan, 1967) and VVIQ (Marks, 1973), focusing on different aspects of mental imagery. Additionally, methodological limitations further complicated the interpretation of these findings; for example, studies had small sample sizes, and some utilised unvalidated measures. Despite these inconsistencies, it appears that imagery vividness is altered in psychosis, but the direction of this alteration remains unclear.

5.2 Spatial imagery

Conflicting results were apparent when exploring spatial imagery. Various papers reported that individuals with psychosis had deficits in spatial imagery (Ba et al., 2022; Mazhari et al., 2014; 2015; 2016), while other studies showed that individuals with psychosis had preserved or enhanced abilities (Aleman, 2005; Benson & Park, 2013; Chandiramni, 1987; Matthews et al., 2013). The variation in findings could be due to the differing methodologies. Studies that found deficits used objective measures such as the mental-hand rotation task. The mental-hand rotation task captures the cognitive processes underlying mental imagery, producing a quantifiable result. Therefore, this may be a more reliable method than self-report measures, which are subject to biases and lack ecological validity

(Matthews et al., 2014), particularly as people affected by psychosis tend to have limitations in their perception of their cognitive processes (Sellwood et al., 2013). However, these tasks primarily assess spatial visualisation abilities and may not capture other aspects of mental imagery.

Other studies that found spared or enhanced spatial ability in individuals diagnosed with psychosis all utilised self-report measures that measure explicit imagery (Aleman, 2005; Benson & Park, 2013; Chandiramni, 1987; Matthews et al., 2013). Spatial imagery in individuals with psychosis appears altered however the direction is unclear. A greater weight could be given to studies that utilised objective measures as these have more reliability. The discrepancy between findings between the differing methodologies highlights the need for a comprehensive approach that combines objective and subjective measures to develop a greater understanding of spatial imagery abilities in individuals with psychosis.

5.3 Object imagery

Three research studies found consistent results that individuals with psychosis have deficits in object recognition (Aleman, 2005; Ba et al., 2022; Doniger, 2001). The research employed varied methodologies with differing experimental tasks.

5.4 Imagery and Symptomology

A complex relationship was found between imagery and symptomology. Some studies found an association between vivid or involuntary imagery and hallucinations (Alle et al., 2020; Böcker et al., 2000; Malcom, 2015; Mintz & Alpert, 1972). Additionally, studies supported the cognitive model of psychosis (Brébion et al., 1977; Brébion, 2008; Böcker et al., 2000), which suggests that deficits in reality monitoring contribute to the misattribution of internally generated mental images (Horowitz, 1975). Other research found no association between imagery and symptomology in individuals with psychosis (Aleman, 2003; Bentall, 1991; Brébion & Gildon, 2011; Oertel et al., 2009; Sack et al., 2005). The discrepancy in findings could be due to the various methodologies and measurements of imagery, which present differing validity, reliability and sensitivity levels. Despite this, the potential association between mental imagery and symptomatology suggests that exploring and addressing mental imagery in clinical settings could be valuable in managing the symptoms of individuals with psychosis.

5.5 Limitations of Studies

Several limitations were identified across the reviewed studies. Many studies did not control for confounding variables such as executive functioning or working memory. These

are known to have a complex interplay with mental imagery (Baddeley & Andrade, 2000, Harrison & Tong, 2009). Additionally, many studies exhibited small sample sizes, which may lack the statistical power to detect a significant effect (Serdar et al., 2021). Study samples also contained predominately male participants, limiting the applicability of the results to women. Furthermore, there was a lack of consideration given across most studies to the changeability of psychotic symptoms across the lifespan (Heilbronner et al., 2016). Moreover, most individuals diagnosed with psychosis were taking antipsychotic medication. Antipsychotic medication can affect cognitive functioning, including memory, attention, and executive function (Haddad et al., 2023). Not all studies controlled for medication, which could limit the conclusions drawn. Finally, all studies within this review had a cross-sectional design, where exposure and outcome were only measured at a single point. These limitations mean studies can be prone to certain biases (Setia, 2016), which could affect the reliability and validity of their findings.

5.6 Strengths & Limitations

To the author's knowledge, this was the first review to explore this topic. A comprehensive literature search was conducted, which adhered to the guidance of the PRISMA systematic review protocol (Moher et al., 2015). Studies were quality assessed by use of the JBI Critical Appraisal Checklist for Analytical Cross-Sectional studies (JBI-MaStari; Joanna Briggs Institute, 2017). Please refer to Appendix 1-A to view the checklist. This helped to mitigate the risk of bias and methodological quality across studies. Finally, the review contained clear inclusion and exclusion criteria and search terms, which offer future research opportunities to reproduce findings.

The review is limited by the search being restricted to English papers only and peer-reviewed journals. This may mean relevant records have been excluded, which could result in bias and reduce generalisability (Jackson et al., 2019). It is also essential to recognise that findings from this review are primarily from studies in Western cultures. Therefore, these findings may lack generalisability to other non-western cultures. Cultural factors could potentially affect the role that mental imagery plays in symptomology. For example, in some non-western cultures, hallucinations or other psychotic symptoms can be interpreted by society differently through cultural, spiritual or religious frameworks (Kulhara & Subho, 2001). Future research should explore the role of mental imagery in psychosis across a diverse range of cultural settings, considering the need for adaptation to local beliefs and practices.

Additionally, it must be highlighted that the review is limited by only five articles explicitly exploring the participants' race. This shows a significant gap in the literature in collecting important demographics of participants. This could mean a lack of awareness about the importance of diversity in research within this field. Future research should aim to capture participants' race to enhance the generalisability of findings.

Moreover, the definition of mental imagery is variable throughout the literature. This could have led to the omission of relevant articles. Although there was a thorough search strategy, it is possible that relevant records were overlooked. This risk was mitigated by having a second reviewer and consulting the Faculty Librarian at Lancaster University on search terms, and by including a forward and backwards citation search. Finally, the heterogeneity of imagery measurement across studies and the inconsistent results across the literature made it challenging to make conclusions.

5.7 Clinical Implications

The findings of this review hold several important clinical implications for the treatment of individuals with psychosis. As mental imagery has been shown to influence symptomology, including hallucinations and delusions (Aleman, 2003; Oertel et al., 2009; Sack et al., 2005), clinicians must consider mental imagery during assessment and intervention planning. Exploring mental imagery with clients could lead to a deeper understanding of how imagery contributes to the maintenance or exacerbation of symptoms, allowing for the development of more tailored and effective interventions. From the results of the current review, interventions that include prompts or contextual cues may benefit individuals with deficits in object imagery.

A strength of mental imagery interventions is that they can be easily integrated with established psychological models, such as cognitive behavioural therapy. National Institute for Health and Care Excellence (NICE) guidelines recommend Cognitive Behavioural Therapy for psychosis (CBTp) "to reduce distress, improve functioning and promote alternative ways of coping with the target symptom" (NICE, 2005). Mental imagery interventions could align with these goals (Taylor et al., 2019) and the National Health Service Long-Term Plan (NHS England, 2019). The NHS Long-Term Plan (NHS England, 2019) proposes the importance of providing innovative and client-centred mental health support. Further research into mental imagery and psychosis is required to understand further how mental imagery interacts with symptomology. This could potentially aid the development of protocols that could be eventually incorporated into NICE guidelines.

5.8 Future Research

Future research should aim for greater methodological rigour, including larger sample sizes and experimental approaches where appropriate to enhance the reliability of findings. Additionally, it should aim to control for confounding variables such as cognitive functioning, stage of psychosis, and medication to derive a true reflection of mental imagery ability. It would benefit future studies to prioritise objective imagery measures, as they are more reliable and less prone to bias. Combining explicit and implicit imagery measures would also help to obtain a holistic view of mental imagery in individuals with psychosis. Finally, the definition of mental imagery varies across the literature (Thompson, 2007) therefore, consistent definitions of mental imagery and measures across studies would improve comparability and validity.

5.9 Conclusion

This systematic review contributes to the nuanced understanding of the complex relationship between mental imagery and psychosis. Mental imagery is altered in individuals with psychosis and could be potentially associated with symptomology. It has shone a light upon the inconsistencies and methodological limitations within this field of research. Acknowledging these limitations, future high-quality research is required to enhance the understanding of the interplay between mental imagery and psychosis. In doing so, this will help develop effective and targeted interventions for this group.

6. References

Aleman, A., Böcker, K. B. E., Hijman, R., de Haan, E. H. F., & Kahn, R. S. (2003). Cognitive basis of hallucinations in schizophrenia: role of top-down information processing. *Schizophrenia Research*, *64*(2-3), 175–185. https://doi.org/10.1016/s0920-9964(03)00060-4

Aleman, A., de Haan, E. H., & Kahn, R. S. (2005). Object versus spatial visual mental imagery in patients with schizophrenia. Journal of psychiatry & neuroscience: JPN, 30(1), 53–56. PMID: 15644999

Alle, M. C., Berna, F., J.-M., D., & Berntsen, D. (2020). Seeing or hearing one's memories: Manipulating autobiographical memory imagery in schizophrenia. *Psychiatry Research*, *286*, 112835. https://doi.org/https://dx.doi.org/10.1016/j.psychres.2020.112835

Altman, D. G. (1990). *Practical Statistics for Medical Research*. CRC Press.

Andrade, J., May, J., Deeprose, C., Baugh, S.-J., & Ganis, G. (2013). Assessing vividness of mental imagery: The Plymouth Sensory Imagery Questionnaire. *British Journal of Psychology*, *105*(4), 547–563. https://doi.org/10.1111/bjop.12050

Auvinen-Lintunen, L., Ilonen, T., Kieseppä, T., Suvisaari, J., & Lindgren, M. (2021). Mental Imagery in Early Psychosis. *Imagination, Cognition and Personality*, 027623662110217. https://doi.org/10.1177/02762366211021762

Baddeley, A. D., & Andrade, J. (2000). Working memory and the vividness of imagery. *Journal of Experimental Psychology: General*, *129*(1), 126–145. https://doi.org/10.1037/0096-3445.129.1.126

Battig, W. F., & Montague, W. E. (1969). Category norms for verbal items in 56 categories: A replication and extension of the Connecticut category norms. *Journal of Experimental Psychology (Monograph), 80,* 1–46.

Bauckhage, J., & Sell, C. (2021). When and for whom do psychodynamic therapists use guided imagery? Explicating practitioners' tacit knowledge. *Research in Psychotherapy: Psychopathology, Process and Outcome*, *24*(3). https://doi.org/10.4081/ripppo.2021.577

Benson, T. L., & Park, S. (2013). Impaired, intact and enhanced visuospatial functions in schizophrenia and the implication for parietal abnormalities. *Schizophrenia Bulletin*, *39*(SUPPL. 1), S257–S258. https://doi.org/https://dx.doi.org/10.1093/schbul/sbt011

Bentall, R. P., Baker, G. A., & Havers, S. (1991). Reality monitoring and psychotic hallucinations. *The British journal of clinical psychology*, *30*(3), 213–222. https://doi.org/10.1111/j.2044-8260.1991.tb00939.x

Berg, K. C., Voncken, M. J., Hendrickson, A., Martina Di Simplicio, Regeer, E. J., L. Rops, & G.P.J. Keijsers. (2023). Exploring aspects of self-reported emotional mental imagery in patients with bipolar disorder. *Journal of Behavior Therapy and Experimental Psychiatry*, *81*, 101861–101861. https://doi.org/10.1016/j.jbtep.2023.101861

Betts, G. H. (1909). The distribution and functions of mental imagery (No. 26). Ams Press.

Blackwell, S. E. (2019). Mental imagery: From basic research to clinical practice. *Journal of Psychotherapy Integration, 29*(3), 235–247. https://doi.org/10.1037/int0000108

Blajenkova, O., Kozhevnikov, M., & Motes, M. A. (2006). Object-spatial imagery: a new self-report imagery questionnaire. *Applied Cognitive Psychology*, *20*(2), 239–263. https://doi.org/10.1002/acp.1182

Böcker, K. B., Hijman, R., Kahn, R. S., & de Haan, E. H. (2000). Perception, mental imagery and reality discrimination in hallucinating and non-hallucinating schizophrenic patients. *The British Journal of Clinical Psychology*, *39*(4), 397–406. https://doi.org/10.1348/014466500163392

Brébion, G., Smith, M. J., Gorman, J. M., & Amador, X. (1996). Reality monitoring failure in schizophrenia: the role of selective attention. *Schizophrenia research*, *22*(2), 173–180. https://doi.org/10.1016/s0920-9964(96)00054-

Brébion, G., Ohlsen, R. I., Pilowsky, L. S., & David, A. S. (2008). Visual Hallucinations in Schizophrenia: Confusion Between Imagination and Perception. *Neuropsychology*, *22*(3), 383–389. https://doi.org/https://dx.doi.org/10.1037/0894-4105.22.3.383

Brébion, G., Ohlsen, R. I., Pilowsky, L. S., & David, A. S. (2011). Serial and semantic encoding of lists of words in schizophrenia patients with visual hallucinations. *Psychiatry Research*, *186*(1), 5–10. https://doi.org/10.1016/j.psychres.2010.07.053

Brewin, C. R., Gregory, J. D., Lipton, M., & Burgess, N. (2010). Intrusive images in psychological disorders: Characteristics, neural mechanisms, and treatment implications. *Psychological Review*, *117*(1), 210–232. https://doi.org/10.1037/a0018113

Brown, G.P., Macleod, A.K., Tata, P., Goddard, L., 2002. Worry and the simulation of future outcomes. Anxiety Stress and Coping 15 (1), 1-1

Chandiramani, K., & Varma, V. K. (1987). Imagery in schizophrenic patients compared with normal controls. *British Journal of Medical Psychology*, *60*(4), 335–341. https://doi.org/10.1111/j.2044-8341.1987.tb02752.x

Correll, C., & Schooler, N. (2020). Negative symptoms in schizophrenia: A review and clinical guide for recognition, assessment, and treatment. *Neuropsychiatric Disease and Treatment*, *16*(1), 519–534. https://doi.org/10.2147/ndt.s225643

D'Argembeau, A., Raffard, S., & Van der Linden, M. (2008). Remembering the past and imagining the future in schizophrenia. *Journal of Abnormal Psychology*, *117*(1), 247–251. https://doi.org/10.1037/0021-843x.117.1.247

David, A. S., & Cutting, J. C. (1993). Visual imagery and visual semantics in the cerebral hemispheres in schizophrenia. *Schizophrenia Research*, *8*(3), 263–271. https://doi.org/10.1016/0920-9964(93)90025-e

De Haan, E. H. F., Heywood, C. A., Young, A. W., Edelstyn, N., & Newcombe, F. (1995). Ettlinger revisited: The relation between agnosia and sensory impairment. *Journal of Neurology, Neurosurgery & Psychiatry, 58*(3), 350–356. https://doi.org/10.1136/jnnp.58.3.350

Deeprose, C., & Holmes, E. A. (2010). An Exploration of Prospective Imagery: The Impact of Future Events Scale. *Behavioural and Cognitive Psychotherapy*, *38*(2), 201–209. https://doi.org/10.1017/s1352465809990671

Di Corrado, D., Guarnera, M., Vitali, F., Quartiroli, A., & Coco, M. (2019). Imagery ability of elite level athletes from individual vs. team and contact vs. no-contact sports. *PeerJ*, *7*, e6940. https://doi.org/10.7717/peerj.6940

Doniger, G. M., Silipo, G., Rabinowicz, E. F., Snodgrass, J. G., & Javitt, D. C. (2001). Impaired sensory processing as a basis for object-recognition deficits in

schizophrenia. *The American journal of psychiatry*, *158*(11), 1818–1826. https://doi.org/10.1176/appi.ajp.158.11.1818

Ekstrom, R. B., French, J. W., Harman, H. H., and Derman, D. (1976). *Manual for Kit of Factor-Referenced Cognitive Tests*. Princeton, NJ: Educational Testing Service.

Farah, M. J., & Smith, A. F. (1983). Perceptual interference and facilitation with auditory imagery. *Perception and Psychophysics*, *33*, 475±478.

Friedlander, K. J., Lenton, F. H., & Fine, P. A. (2022). A multifactorial model of visual imagery and its relationship to creativity and the vividness of Visual Imagery Questionnaire. Psychology of Aesthetics, Creativity, and the Arts. Advance online publication. https://doi.org/10.1037/aca0000520

Gaebel, W., & Zielasek, J. (2015). Focus on psychosis. *Dialogues in Clinical Neuroscience*, *17*(1), 9–18. https://pubmed.ncbi.nlm.nih.gov/25987859/

Garrison, J. R., Bond, R., Gibbard, E., Johnson, M. K., & Simons, J. S. (2017). Monitoring what is real: The effects of modality and action on accuracy and type of reality monitoring error. *Cortex*, *87*, 108–117. https://doi.org/10.1016/j.cortex.2016.06.018

Gordon R. An investigation into some factors that favour the formation of stereotyped images. *British Journal of Psychology*, 1949, 39, 156–167.

Hackmann, A., & Holmes, E. (2004). Reflecting on imagery: A clinical perspective and overview of the special issue ofMemoryon mental imagery and memory in psychopathology. *Memory*, *12*(4), 389–402. https://doi.org/10.1080/09658210444000133

Haddad, C., Salameh, P., Sacre, H., Clément, J.-P., & Calvet, B. (2023). Effects of antipsychotic and anticholinergic medications on cognition in chronic patients with schizophrenia. *BMC Psychiatry*, *23*(1). https://doi.org/10.1186/s12888-023-04552-y

Harrison, S. A., & Tong, F. (2009). Decoding reveals the contents of visual working memory in early visual areas. *Nature*, *458*(7238), 632–635. https://doi.org/10.1038/nature07832

Harvey, P. D. (1985). Reality monitoring in mania and schizophrenia: The association of thought disorder and performance. *Journal of Nervous and Mental Disease, 173*(2), 67–73. https://doi.org/10.1097/00005053-198502000-00001

Heilbronner, U., Samara, M., Leucht, S., Falkai, P., & Schulze, T. G. (2016). The Longitudinal Course of Schizophrenia Across the Lifespan. *Harvard Review of Psychiatry*, *24*(2), 118–128. https://doi.org/10.1097/hrp.0000000000000092

Holmes, E. A., Grey, N., & Young, K. A. D. (2005). Intrusive images and "hotspots" of trauma memories in Posttraumatic Stress Disorder: an exploratory investigation of emotions and cognitive themes. *Journal of Behavior Therapy and Experimental Psychiatry*, *36*(1), 3–17. https://doi.org/10.1016/j.jbtep.2004.11.002

Holmes, E. A., Geddes, J. R., Colom, F., & Goodwin, G. M. (2008). Mental imagery as an emotional amplifier: Application to bipolar disorder. *Behaviour Research and Therapy*, *46*(12), 1251–1258. https://doi.org/10.1016/j.brat.2008.09.005

Holmes, E. A., Lang, T. J., & Deeprose, C. (2009). Mental Imagery and Emotion in Treatment across Disorders: Using the Example of Depression. *Cognitive Behaviour Therapy*, *38*(sup1), 21–28. https://doi.org/10.1080/16506070902980729

Holmes, E. A., & Mathews, A. (2010). Mental imagery in emotion and emotional disorders. *Clinical Psychology Review*, *30*(3), 349–362. https://doi.org/10.1016/j.cpr.2010.01.001

Horowitz, M. J. (1975). Intrusive and Repetitive Thoughts After Experimental Stress. *Archives of General Psychiatry*, *32*(11), 1457. https://doi.org/10.1001/archpsyc.1975.01760290125015

Huddy, V., Drake, G., & Wykes, T. (2016). Mental simulation and experience as determinants of performance expectancies in people with schizophrenia spectrum disorder. *Psychiatry Research*, *237*, 97–102. https://doi.org/10.1016/j.psychres.2016.01.072

Jackson, J. L., & Kuriyama, A. (2019). How Often Do Systematic Reviews Exclude Articles Not Published in English? *Journal of General Internal Medicine*, *34*(8), 1388–1389. https://doi.org/10.1007/s11606-019-04976-x

Ji, J. L., Kavanagh, D. J., Holmes, E. A., MacLeod, C., & Di Simplicio, M. (2019). Mental imagery in psychiatry: conceptual & clinical implications. *CNS Spectrums*, *24*(1), 114–126. https://doi.org/10.1017/s1092852918001487

Joanna Briggs Institute. (2017). *Checklist for Analytical Cross Sectional Studies Critical Appraisal Checklist for Analytical Cross Sectional Studies 2*. https://jbi.global/sites/default/files/2019-05/JBI_Critical_Appraisal-Checklist_for_Analytical_Cross_Sectional_Studies2017_0.pdf

Johnson, M. K., & Raye, C. L. (1981). Reality monitoring. *Psychological Review*, *88*(1), 67–85. https://doi.org/10.1037/0033-295x.88.1.67

Kay, S. R., Fiszbein, A., & Opler, L. A. (1987). The Positive and Negative Syndrome Scale (PANSS) for Schizophrenia. *Schizophrenia Bulletin*, *13*(2), 261–276. https://doi.org/10.1093/schbul/13.2.261

Kirby, J. R., Moore, P. J., & Schofield, N. J. (1988). Verbal and visual learning styles. *Contemporary Educational Psychology*, *13*(2), 169–184. https://doi.org/10.1016/0361-476x(88)90017-3

Königsmark, V. T., Bergmann, J., & Reeder, R. R. (2021). The Ganzflicker experience: High probability of seeing vivid and complex pseudo-hallucinations with imagery but not aphantasia. *Cortex*. https://doi.org/10.1016/j.cortex.2021.05.007

Kosslyn, S. M. (1996). Image and brain: The resolution of the imagery debate. MIT press.

Kosslyn, S. M., Ganis, G., & Thompson, W. L. (2001). Neural foundations of imagery. *Nature Reviews Neuroscience*, *2*(9), 635–642. https://doi.org/10.1038/35090055

Kosslyn, S. M. (2005). Mental images and the Brain. *Cognitive Neuropsychology*, *22*(3–4), 333–347. https://doi.org/10.1080/02643290442000130

Kulhara, P., & Chakrabarti, S. (2001). CULTURE AND SCHIZOPHRENIA AND OTHER PSYCHOTIC DISORDERS. *Psychiatric Clinics of North America*, *24*(3), 449–464. https://doi.org/10.1016/s0193-953x(05)70240-9\

Laing, J., Morland, T., & Fornells-Ambrojo, M. (2015). The Phenomenology and Generation of Positive Mental Image Garrison, J. R., Bond, R., Gibbard, E., Johnson, M. K., & Simons, J. S. (2017). Monitoring what is real: The effects of modality and action on accuracy and type of reality monitoring error. *Cortex*, *87*, 108–117. https://doi.org/10.1016/j.cortex.2016.06.018

Laing, J., Morland, T., & Fornells-Ambrojo, M. (2016). The phenomenology and generation of positive mental imagery in early psychosis. *Clinical psychology & psychotherapy*, *23*(6), 523-532 https://doi.org/10.1002/cpp.1976

Lee, Y. H. (2019). Strengths and Limitations of Meta-Analysis. *The Korean Journal of Medicine*, *94*(5), 391–395. https://doi.org/10.3904/kjm.2019.94.5.391

Liberati, A., Altman, D. G., Tetzlaff, J., Mulrow, C., Gøtzsche, P. C., Ioannidis, J. P. A., Clarke, M., Devereaux, P. J., Kleijnen, J., & Moher, D. (2009). The PRISMA Statement for Reporting Systematic Reviews and Meta-Analyses of Studies That Evaluate Health Care Interventions: Explanation and Elaboration. *PLoS Medicine*, *6*(7), e1000100. https://doi.org/10.1371/journal.pmed.1000100

Malay, S., & Chung, K. C. (2012). The Choice of Controls for Providing Validity and Evidence in Clinical Research. *Plastic and Reconstructive Surgery*, *130*(4), 959–965. https://doi.org/10.1097/prs.0b013e318262f4c8

Malcolm, C. P., Picchioni, M. M., & Ellett, L. (2015). Intrusive prospective imagery, posttraumatic intrusions and anxiety in schizophrenia. *Psychiatry Research*, *230*(3), 899–904. https://doi.org/10.1016/j.psychres.2015.11.029

Marks, D. F. (1973). *Vividness of Visual Imagery Questionnaire (VVIQ)* [Database record]. APA PsycTests.

Matthews, N. L., Collins, K. P., Thakkar, K. N., & Park, S. (2014). Visuospatial imagery and working memory in schizophrenia. *Cognitive Neuropsychiatry*, *19*(1), 17–35. https://doi.org/https://dx.doi.org/10.1080/13546805.2013.779577

Mazhari, S., & Moghadas Tabrizi, Y. (2014). Abnormalities of mental rotation of hands associated with speed of information processing and executive function in chronic schizophrenic patients. *Psychiatry and Clinical Neurosciences 68*(6), 410–417. https://doi.org/10.1111/pcn.12148

Mazhari, S., Tabrizi, Y. M., & Nejad, A. G. (2015). Neural evidence for compromised mental imagery in individuals with chronic schizophrenia. *The Journal of Neuropsychiatry and Clinical Neurosciences*, *27*(2), 127–132. https://doi.org/10.1176/appi.neuropsych.13120392

Mazhari, S., Parvaresh, N., Pourrahimi, A. M., Rajabizadeh, G., & Abasabadi, K. (2017). Mental imagery in first-degree relatives of patients with Schizophrenia. *Iranian Journal of Psychiatry and Behavioral Sciences*, *11*(2), e7425. https://doi.org/https://dx.doi.org/10.5812/ijpbs.7425

Mehta, Z., Newcombe, F., & De Haan, E. (1992). Selective loss of imagery in a case of visual agnosia. *Neuropsychologia*, *30*(7), 645–655. https://doi.org/10.1016/0028-3932(92)90069-x

Mintz, S., & Alpert, M. (1972). Imagery vividness, reality testing, and schizophrenic hallucinations. *Journal of Abnormal Psychology, 79*(3), 310–316. https://doi.org/10.1037/h0033209

Moore, D. S., & Johnson, S. P. (2020). The development of mental rotation ability across the first year after birth. *Advances in Child Development and Behavior*, 1–33. https://doi.org/10.1016/bs.acdb.2020.01.001

Morrison, A. P., & Haddock, G. (1997). Cognitive factors in source monitoring and auditory hallucinations. *Psychological Medicine*, *27*(3), 669–679. https://doi.org/10.1017/s003329179700487x

Munn, Z., Barker, T. H., Moola, S., Tufanaru, C., Stern, C., McArthur, A., Stephenson, M., & Aromataris, E. (2020). Methodological Quality of Case Series Studies. *JBI Database of Systematic Reviews and Implementation Reports*, *18*(10), 1. https://pubmed.ncbi.nlm.nih.gov/33038125/

NICE. (2015). *Psy Psychosis and schizophrenia in adults chosis and schizophrenia in adults*. https://www.nice.org.uk/guidance/qs80/resources/psychosis-and-schizophrenia-in-adults-pdf-2098901855941

Oertel, V., Rotarska-Jagiela, A., V, van de V., Haenschel, C., Grube, M., Stangier, U., Maurer, K., & Linden, D. E. J. (2009). Mental imagery vividness as a trait marker across the schizophrenia spectrum. *Psychiatry Research*, *167*(1–2), 1–11. https://doi.org/https://dx.doi.org/10.1016/j.psychres.2007.12.008

Page, M. J., McKenzie, J. E., Bossuyt, P. M., Boutron, I., Hoffmann, T. C., Mulrow, C. D., Shamseer, L., Tetzlaff, J. M., Akl, E. A., Brennan, S. E., Chou, R., Glanville, J., Grimshaw, J. M., Hróbjartsson, A., Lalu, M. M., Li, T., Loder, E. W., Mayo-Wilson,

E., McDonald, S., & McGuinness, L. A. (2021). The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. *Systematic Reviews*, *10*(1). https://doi.org/10.1186/s13643-021-01626-4

Parsons, L. M. (1994). Temporal and kinematic properties of motor behavior reflected in mentally simulated action. *Journal of experimental Psychology: Human perception and Performance*, *20*(4), 709.

Pearson, D. G. (2007). Mental Imagery and Creative Thought. *Imaginative Minds*. https://doi.org/10.5871/bacad/9780197264195.003.0009

Pearson, D. G., Deeprose, C., Wallace-Hadrill, S. M. A., Heyes, S. B., & Holmes, E. A. (2013). Assessing mental imagery in clinical psychology: A review of imagery measures and a guiding framework. *Clinical Psychology Review*, *33*(1), 1–23. https://doi.org/10.1016/j.cpr.2012.09.001

Pearson, J., Naselaris, T., Holmes, E. A., & Kosslyn, S. M. (2015). Mental Imagery: Functional Mechanisms and Clinical Applications. *Trends in Cognitive Sciences*, *19*(10), 590–602. https://doi.org/10.1016/j.tics.2015.08.003

Pellizzer, G., Bâ, M. B., Zanello, A., & Merlo, M. C. G. (2009). Asymmetric learning transfer between imagined viewer- and object-rotations: Evidence of a hierarchical organization of spatial reference frames. *Brain and Cognition*, *71*(3), 272–278. https://doi.org/10.1016/j.bandc.2009.08.001

Pillny, M., Hallford, D. J., & Böge, K. (2024). The Nature of Mental Imagery and its Relationship with Amotivational Psychopathology in People with Schizophrenia Spectrum Disorders. *Behavior Therapy*. https://doi.org/10.1016/j.beth.2024.01.009

Raffard, S., D'Argembeau, A., Bayard, S., Boulenger, J.-P., & van der Linden, M. (2010). Scene construction in schizophrenia. *Neuropsychology*, *24*(5), 608–615. https://doi.org/10.1037/a0019113

Raven, J. (2003). Raven progressive matrices. In *Handbook of nonverbal assessment* (pp. 223-237). Boston, MA: Springer US.

Reisberg, D., Pearson, D. G., & Kosslyn, S. M. (2003). Intuitions and introspections about imagery: The role of imagery experience in shaping an investigator's theoretical views. *Applied Cognitive Psychology, 17*(2), 147–160. https://doi.org/10.1002/acp.858

Richardson, J. T., & Vecchi, T. (2002). A jigsaw-puzzle imagery task for assessing active visuospatial processes in old and young people. *Behavior Research Methods, Instruments, & Computers*, *34*(1), 69-82. https://doi.org/10.3758/bf03195425.

Richardson, A. (2013). *Mental imagery*. Springer.

Ruiz-Castañeda, P., Santiago Molina, E., Aguirre Loaiza, H., & Daza González, M. T. (2022). Positive symptoms of schizophrenia and their relationship with cognitive and emotional executive functions. *Cognitive Research: Principles and Implications*, *7*(1). https://doi.org/10.1186/s41235-022-00428-z

Sack, A. T., van de Ven, V. G., Etschenberg, S., Schatz, D., & Linden, D. E. J. (2005a). Enhanced vividness of mental imagery as a trait marker of schizophrenia? *Schizophrenia Bulletin*, *31*(1), 97–104. https://doi.org/10.1093/schbul/sbi011

Sack, A. T., & Schuhmann, T. (2012). Hemispheric Differences within the Fronto-Parietal Network Dynamics Underlying Spatial Imagery. *Frontiers in psychology*, *3*, 214. https://doi.org/10.3389/fpsyg.2012.00214

Sellwood, W., Morrison, A. P., Beck, R., Heffernan, S., Law, H., & Bentall, R. P. (2013). Subjective Cognitive Complaints in Schizophrenia: Relation to Antipsychotic Medication Dose, Actual Cognitive Performance, Insight and Symptoms. *PLoS ONE*, *8*(12), e83774. https://doi.org/10.1371/journal.pone.0083774

Serdar, C. C., Cihan, M., Yücel, D., & Serdar, M. A. (2021). Sample size, Power and Effect Size revisited: Simplified and Practical Approaches in pre-clinical, Clinical and Laboratory Studies. *Biochemia Medica*, *31*(1), 27–53. https://doi.org/10.11613/bm.2021.010502

Setia, M. S. (2016). Methodology series module 3: Cross-sectional studies. *Indian Journal of Dermatology*, *61*(3), 261–264. NCBI. https://doi.org/10.4103/0019-5154.182410

Sheehan, P. W. (1967). A shortened form of Betts' questionnaire upon mental imagery. Journal of Clinical Psychology, 23(3), 386–389. https://doi.org/10.1002/1097-4679(196707)23:3<386::AID-JCLP2270230328>3.0.CO;2-S

Shepard, R. N., & Metzler, J. (1971). Mental rotation of three-dimensional objects. *Science, 171*(3972), 701–703. https://doi.org/10.1126/science.171.3972.701

Shine, J. M., Keogh, R., O'Callaghan, C., Muller, A. J., Lewis, S. J. G., & Pearson, J. (2015). Imagine that: elevated sensory strength of mental imagery in individuals with Parkinson's disease and visual hallucinations. *Proceedings of the Royal Society B: Biological Sciences*, *282*(1798), 20142047. https://doi.org/10.1098/rspb.2014.2047

Smithson, C., Eichbaum, Q., & Gauthier, I. (2023). Object recognition ability predicts category learning with medical images. *Cognitive Research: Principles and Implications*, *8*(1). https://doi.org/10.1186/s41235-022-00456-9

Snodgrass, J. G., & Vanderwart, M. (1980). A standardized set of 260 pictures: norms for name agreement, image agreement, familiarity, and visual complexity. Journal of experimental psychology: Human learning and memory, 6(2), 174.

Tarrier, N. (2010). Broad Minded Affective Coping (BMAC): A "positive" CBT approach to facilitating positive emotions. *International Journal of Cognitive Therapy, 3*(1), 64–76. https://doi.org/10.1521/ijct.2010.3.1.64

Taylor, C. D. J., Bee, P. E., Kelly, J., Emsley, R., & Haddock, G. (2020). iMAgery focused psychological therapy for persecutory delusions in PSychosis (iMAPS): a multiple baseline experimental case series. *Behavioural and Cognitive Psychotherapy*, *48*(5), 530–545. https://doi.org/10.1017/s1352465820000168

Thompson, E. (2006). Look again: Phenomenology and mental imagery. *Phenomenology and the Cognitive Sciences*, *6*(1-2), 137–170. https://doi.org/10.1007/s11097-006-9031-1

Thorndike E. L., Lorge I. *Teacher's word book of 30,000 words*. New York: Teachers Coll., Columbia Univer. Press, 1944.

Vannucci, M., Mazzoni, G., Chiorri, C., & Cioli, L. (2008). Object imagery and object identification: object imagers are better at identifying spatially-filtered visual objects. *Cognitive Processing*, *9*(2), 137–143. https://doi.org/10.1007/s10339-008-0203-5

Wagner, S., & Monzel, M. (2023). Measuring imagery strength in schizophrenia: no evidence of enhanced mental imagery priming. *Brain and Behavior*, *13*(9). https://doi.org/10.1002/brb3.3146

Weßlau, C., & Steil, R. (2014). Visual mental imagery in psychopathology — Implications for the maintenance and treatment of depression. *Clinical Psychology Review*, *34*(4), 273–281. https://doi.org/10.1016/j.cpr.2014.03.001

Zarrinpar, A., Deldin, P., & Kosslyn, S. M. (2006). Effects of depression on sensory/motor vs. central processing in visual mental imagery. *Cognition and Emotion*, *20*(6), 737-758. https://doi.org/10.1080/02699930500405600

Tables and Figures
Figure 1-1
Study Flow Chart

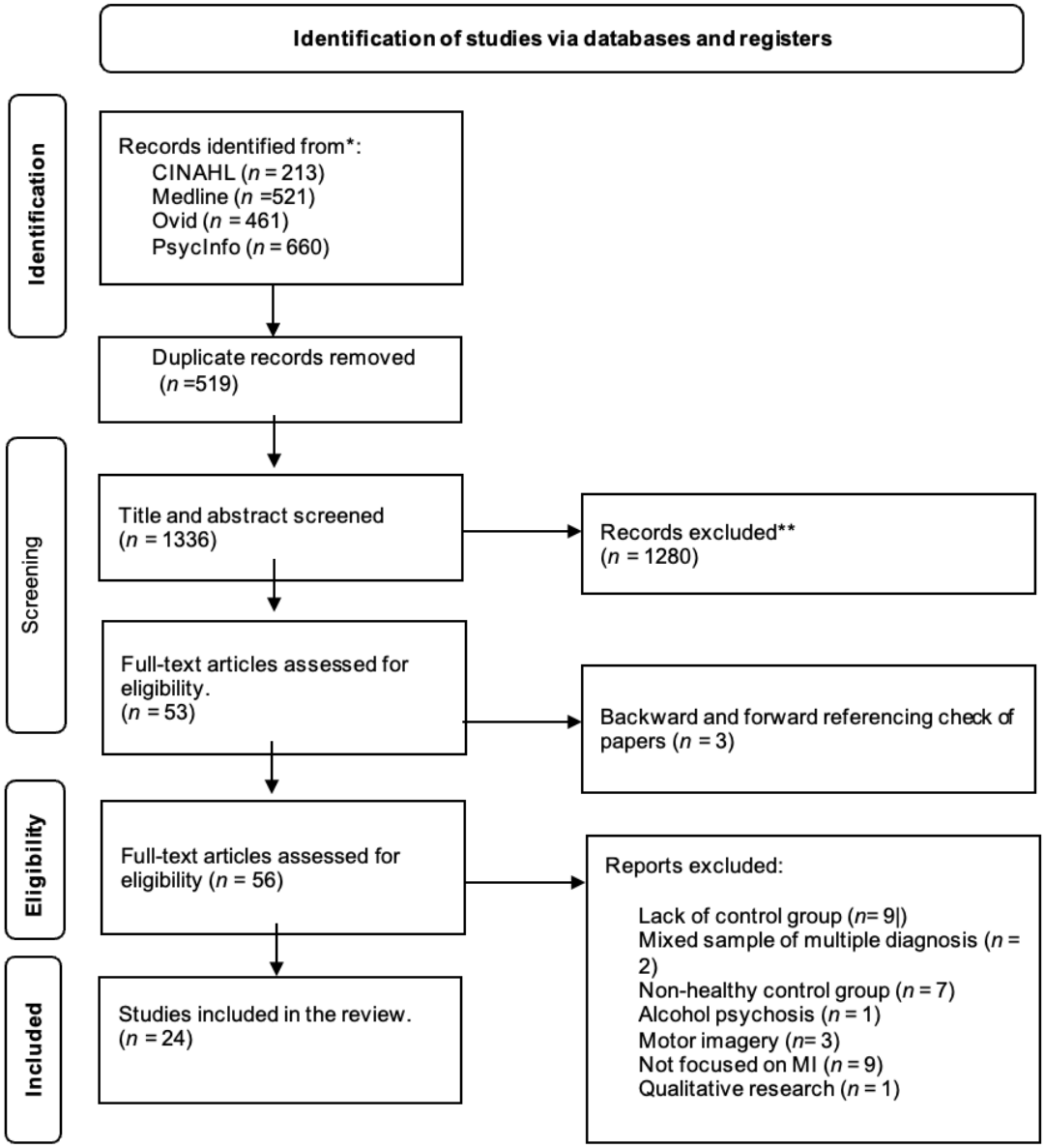

Table 1-1.
Thesaurus terms/MeSH terms searched on databases.

Database	Thesaurus terms/MeSH terms	Keywords
PsyInfo	Acute Schizophrenia; Catatonic Schizophrenia; Childhood Onset Schizophrenia; Schizoaffective Disorder; Schizophrenia; Schizophreniform Disorder; Psychosis; Brief Psychotic Disorder; Chronic Psychosis; Paranoid Psychosis; Schizophrenia; Paranoid Schizophrenia; imagery; spatial memory; mentalization; conceptual imagery	Psychosis; schizo; psychotic disorder; hallucinations; delusions; psychosis; schizo*; psychotic disorder; hallucinations; delusions; Imag* ability; imag* deficit; image questionnaire; image* rescript; Imagery assessment; Imagery measur*; imagery scale; Intrusive memor*; Mental imag*; Mental imagery; perspectives; Mental practice; Mental representation*; prospective imag*; "sensory imag*"; "positive* imag*"; imag* n5 subjective; generation, maintenance; inspection, transform; sensory; spatial.
CINAHL	Schizophrenia; Psychotic Disorders; Schizoaffective Disorder; Paranoid Disorders; Guided Imagery; Imagination; Thinking; Mentalization	Psychosis; schizo; psychotic disorder; hallucinations; delusions; psychosis; schizo*; psychotic disorder; hallucinations; delusions; Imag* ability; imag* deficit; image questionnaire; image* rescript; Imagery assessment; Imagery measur*; imagery scale; Intrusive memor*; Mental imag*; Mental imagery; perspectives; Mental practice; Mental representation*; prospective imag*; "sensory imag*";

		"positive* imag*"; imag* n5 subjective; generation, maintenance; inspection, transform; sensory; spatial.
MEDLINE	Psychotic Disorders; Schizophrenia Spectrum; Other Psychotic Disorders; Schizophrenia; Shared Paranoid Disorder; Schizophrenia Treatment-Resistant; Schizophrenia, Paranoid; Schizophrenia, Disorganized; Schizophrenia, Catatonic; Paranoid Disorders; Affective Disorders; Psychotic	Psychosis; schizo; psychotic disorder; hallucinations; delusions; psychosis; schizo*; psychotic disorder; hallucinations; delusions; Imag* ability; imag* deficit; image questionnaire; image* rescript; Imagery assessment; Imagery measur*; imagery scale; Intrusive memor*; Mental imag*; Mental imagery; perspectives; Mental practice; Mental representation*; prospective imag*; "sensory imag*"; "positive* imag*"; imag* n5 subjective; generation, maintenance; inspection, transform; sensory; spatial.

Table 1-2
Summary table of included studies

Author/Year/ Location	Study design	Measures	Participant demographics	Race	Medication	Measure of imagery	Type of imagery	Main findings
Aleman (2005) The Netherlands	Cross-sectional Comparative	PANSS	PS: *n* = 44 Female: *n* = 7 Male: *n* = 37 Mean age: 29.7 HC: *n* = 20 Female: *n* = 3 Male: *n* = 17 Mean age: 32.5	Not reported	All PS were taking atypical antipsychotics.	Object imagery task – adapted from Mehta et al., (1992). Spatial imagery task - adapted from Kosslyn et al., (1988)	Object imagery Spatial imagery	PS individuals demonstrated a specific impairment in object imagery compared to spatial imagery. Significant difference between PS and controls on the object imagery task ($p = 0.001$). No significant difference on the spatial imagery task ($p = 0.71$).
Aleman et al. (2003) The Netherlands	Cross-sectional Comparative	CASH PANSS	HPS: *n* = 22 Female: *n* = Not reported. Male: *n* = Not reported.	Not reported.	Three service users were not on medication. 54 participants on treatment with atypical antipsychotics.	The visual and auditory *triad comparison* task adapted from Mehta et al.,(1992). Visual modality(Snodgrass & Vanderward, 1980).	Imagery and symptomology	No differences emerged between groups on any of the mental imagery measures, or on reality monitoring accuracy.

Author/Year/ Location	Study design	Measures	Participant demographics	Race	Medication	Measure of imagery	Type of imagery	Main findings
			Mean age: 31.7 NHPS: *n* = 35 Female: *n* = Not reported. Male: *n* = Not reported. Mean age: = 28.6. HC: *n* = 20 Mean age: *n* = Not reported. Female: *n* = Not reported. Male: *n* = Not reported.			Auditory modality. The auditory task – sounds presented by computer. The letter grid task. (Kosslyn et al., 1988). Musical imagery Halpern (1988;). Reality monitoring task Harvey (1985). TVRS; Hustig and Hafner, (1990)		No stable disposition towards abnormal mental imagery associated with hallucinations. For individuals with active hallucinations (*N*=12), hallucination severity correlated positively with a measure of imagery–perception interaction in the auditory modality, *r*=0.70, *p*=0.01.

Author/Year/ Location	Study design	Measures	Participant demographics	Race	Medication	Measure of imagery	Type of imagery	Main findings
Alle et al. (2020) France	Cross-sectional Comparative	PANSS, BDI, CDSS	PS: *n* = 28 Female: *n* = 8 Male: *n* = 20 Mean age: 37.76. HC: *n* = 28 Female: *n* = 8 Male: *n* = 20 Mean age: 36.33.	Not reported.	PS taking antipsychotic treatment.	Autobiographical memory task (Alle et al., 2020)	Imagery vividness	PS rated memories lower on specificity, contextual, feeling of reliving, overall vividness, and autobiographical me-ness.
Ba et al. (2022) Switzerland	Cross-sectional Comparative	PANSS	UHR: *n* = 12 Female: *n* = 2 Male: *n* = 10 Mean age: 22.2 FEP: *n* = 12 Female: *n* = 6 Male: *n* = 6	Not reported.	Majority of PS were receiving antipsychotic medication. Numbers below: UHR: n = 5 FEP: n = 10 A/D: n = 6 CS: n = 14 HC: n = 0	Perspective view task (Pellizzer et al., 2009) Viewer and Object mental rotation tasks	Spatial Imagery Object imagery	FEP and CS had more errors and longer response times with both mental rotation tasks compared to two controls. CS service users had additional difficulty with the object rotation task. PS had a deficit in mental spatial imagery.

Author/Year/ Location	Study design	Measures	Participant demographics	Race	Medication	Measure of imagery	Type of imagery	Main findings
			A/D: *n* = 12 Female: *n* = 6 Male: *n* = 6 CS: *n* = 14 Female: *n* = 5 Male: *n* = 9 HC: *n* = 30 Female: *n* = 16 Male: *n* = 14					

Author/Year/ Location	Study design	Measures	Participant demographics	Race	Medication	Measure of imagery	Type of imagery	Main findings
Benson & Park. (2013) USA	Cross-sectional Comparative	BPRS SAPS SANS PDI SPQ	PS: *n* = 18 Female: *n* = 5 Male: *n* = 13 Mean age: 40.1 HC: *n* = 18 Female: *n* = 8 Male: *n* = 10 Mean age: 41.3	Not reported.	PS were taking antipsychotic medication.	PFT: manipulation JPT : mental imagery manipulation RPM: visuospatial intelligence DRT: working memory maintenance. LB: Spatial Neglect	Spatial imagery	PS showed intact visuospatial intelligence and transformation of location. Enhanced mental imagery manipulation in PS compared to HC.

Author/Year/ Location	Study design	Measures	Participant demographics	Race	Medication	Measure of imagery	Type of imagery	Main findings
Bentall et al. (1991) UK	Cross-sectional Comparative	n/a	HPS: *n* = 22 Female: *n* = 4 Male: *n* = 18 Mean age: 38.7 NHPS: *n* = 16 Female: *n* = 5 Male: *n* = 11 Mean age: 39.75 HC: *n* = 22 Female: *n* = 12 Male: *n* = 10 Mean age: 35.4	Not reported.	HPS & NHPS receiving medication.	Reality monitoring task (Johnson et al., 1981). The items were constructed using norms for responses to category cues (Battig & Montague, 1969)	Imagery and symptomology	HPS more likely to misattribute self-generated items. Related to reality monitoring. Hallucinations are thoughts misattributed to an external source. HC performed better than HPS & NHPS.

Author/Year/ Location	Study design	Measures	Participant demographics	Race	Medication	Measure of imagery	Type of imagery	Main findings
Böcker et al. (2000) The Netherlands	Cross-sectional Comparative	CASH PANSS	HPS: *n* = 13 Female: *n* = 1 Male: *n* = 12 Mean age:33 NHPS: *n* =19 Female: *n* = 6 Male: *n* = 13 Mean age: 35 HC: *n* = 14 Female: *n* = 3 Male: *n* = 11 Mean age:32	Not reported.	All but one individual with PS taking antipsychotic treatment.	Perception : Staircase Method (de Haan et al., 1995) Vividness of mental imagery: line drawings (Mehta et al., 1992) Image of a letter (Farah, 1989) Auditory modality – participants imagined a tone (Farah & Smith, 1983) Reality discrimination – category-association task (Harvey 1985; Morrison & Haddock, 1997)	Imagery and symptomology Imagery vividness	HPS, NHPS and HC displayed no differences on perceptual acuity. For HPS level of vividness of mental images was higher in the auditory modality. Positive relationship between degree of auditory hallucinations and reality discrimination difficulties. Hallucinations could result from increased vividness of mental imagery. Intensity of hallucinations increases with larger impairments discrimination.

Author/Year/ Location	Study design	Measures	Participant demographics	Race	Medication	Measure of imagery	Type of imagery	Main findings
Brebion et al. (1997) USA	Cross-sectional Comparative	PANSS SAPS SANS	PS: *n* = 31 Female: *n* = 10 Male: *n* = 21 Mean age: 36.0 HC: *n* = 31 Female: *n* = Not reported. Male: *n* = Not reported. Mean age: Not reported.	Not reported.	All of PS individuals were taking antipsychotic medication.	Reality monitoring task (Brebion, 1997) Verbal memory task (Thorndike & Lodge, 1944)	Imagery and symptomology	PS displayed impairments in discriminating old and new items and had a higher bias than HC towards recognising new items as if they were old. PS were deficient in discriminating self-generated items from externally generated items, with a higher bias than controls toward attributing self-generated items to an external source. PS were impaired in discriminating between auditory and visual modalities. This was correlated with positive symptomatology in individuals with PS. Mental imagery may play a role in positive symptomatology.

Author/Year/ Location	Study design	Measures	Participant demographics	Race	Medication	Measure of imagery	Type of imagery	Main findings
Brebion et al. (2008) UK	Cross-sectional Comparative	NART SANS SAPS	PS: *n* = 41 Female: *n* = 15 Male: *n* = 26 Mean age: 34.2. HC: *n* = 43 Female: *n* = 27 Male: *n* =16 Mean age: 35.0	PS:21 White 16 Black 4 South Asian HC: 28 White 13 Black 2 South Asian	All PS except three were on daily antipsychotic medication.	Reality monitoring task - Discrimination between imagined and perceived pictures. Sixteen categories (Battig & Montague, 1969)	Imagery and symptomology	PS had a different pattern of recognition accuracy compared to HC. PS made more misattributions to pictures than others. Higher ratings of visual hallucinations were correlated with an increased tendency to remember words as pictures.
Brebion et al. (2011) UK	Cross-sectional Comparative	MADRS SAPS NART	PS: *n* = 41 Female: *n* = 15 Male: *n* = 26 Mean age: 34.2 HC: *n* = 43	PS:21 White 16 Black 4 South Asian	All PS except three were on daily antipsychotic medication.	Eight lists of 16 concrete words were prepared. Four other lists (Battig & Montague, 1969)	Imagery and symptomology	No association present with auditory hallucinations. PS who experienced visual hallucinations were less likely to use rehearsal as a strategy for learning lists.

Author/Year/ Location	Study design	Measures	Participant demographics	Race	Medication	Measure of imagery	Type of imagery	Main findings
			Female: *n* = 27 Male: *n* = 16 Mean age = 35.0	HC: 28 White 13 Black 2 South Asian				PS showed significant impairment in semantic clustering, and reduced ability to use semantic organization as a learning strategy. Visual hallucinations in PS may be correlated with uncommon visual mental images, impacting the encoding of verbal material. .
Chandiramani & Varma (1987) India	Cross-sectional Comparative	MBPRS	NHPS: *n* = 20 Female: *n* = 6 Male: *n* = 14 Mean age: Not reported. HPS: *n* = 20 Female: *n* = 6 Male: *n* = 14 Mean age: Not reported.	Not reported.	Not reported.	Modified version of Bett's Vividness of Imagery Questionnaire (Bett, 1909) Gordon's Test of Visual Imagery (Richardson, 1969)	Imagery and symptomology Spatial imagery	No relationship between HPS and the vividness scores of imageries in the same or different modalities. HPS did not differ from NHPS and HC in controllability of visual imagery. HPS had significantly lower vividness scores for emotional interpersonal items compared to NHPS.

Author/Year/ Location	Study design	Measures	Participant demographics	Race	Medication	Measure of imagery	Type of imagery	Main findings
David & Cutting (1992) UK	Cross-sectional Comparative	BPRS BDI NART	HC *n* = 20 Female: *n* = 6 Male: *n* = 14 Mean age: Not reported. PS: *n* = 46 Female: *n* = 16 Male: *n* = 30 Mean age: 30.9 SA: *n* = 22 Female: *n* = 14 Male: *n* = 8 Mean age: 37.4 HC: *n* = 30	Not reported.	All but 6 PS and 12 SA were receiving antipsychotic treatment.	Tests of visual cognition: Stimuli consisted of 24 items from the Snodgrass and Vanderwart., (1980) line drawings.	Imagery and symptomology	Significant differences in reaction times between the HC and PS group. The PS individuals showed a loss of the left hemisphere advantage for the visual semantic task, while preserving the predictable right hemisphere advantage for the visual imagery task. HPS had a quicker reaction time than controls on the semantic task.

Author/Year/ Location	Study design	Measures	Participant demographics	Race	Medication	Measure of imagery	Type of imagery	Main findings
			Female: *n* = 13 Male: *n* = 17 Mean age: 33.1					
Doniger et al. (2001) USA	Cross-sectional Comparative	PANSS IQ	PS: *n* = 26 Female: *n* = 14 Male: *n* = 12 Mean age *n* = 40.2 HC: *n* = 26 Female: *n* = 8 Male: *n* = 18 Mean age *n* = 37.6	Not reported	PS individuals taking chlorpromazine PS mean medication dose was 1053.1 mg/day.	Part 1 – objection recognition, (Snodgrass & Vanderwart, 1980) Part 2 - the effects of repetition priming on perceptual closure. Part 3 - the effects of both repetition priming and word prompting on perceptual closure.	Object imagery Imagery and Symptomology	PS showed significant deficit in object recognition. They required a greater coherent image to be generated before they could recognise the object. PS benefited as much as HC individuals from previous exposure to the complete pictures and word prompting.
Huddy et al. (2016) UK	Cross-sectional Comparative	IFES HADS PANSS PDS	PS: *n* = 30 Female: *n* = 6 Male: *n* = 24	PS: 10% White British. Data on other ethnic	Not included in text.	Mental Simulation Task involving generating detailed narratives of everyday scenarios.	Imagery and symptomology	Individuals with PS had lower performance expectations and greater expected concern when imagining

Author/Year/ Location	Study design	Measures	Participant demographics	Race	Medication	Measure of imagery	Type of imagery	Main findings
			Mean age: 39.4. HC: *n* = 24 Female: *n* = 7 Male: *n* = 17 Mean age: 36.5	groups not collected. HC: 37.5% were identified as White British. Data on other ethnic groups were not reported.				everyday scenarios compared to HC. Lower performance expectancies were associated with lower experience of similar scenarios, greater negative symptoms, and social withdrawal in the PS group.
Malcolm et al. (2015) UK	Cross-sectional Comparative	HADS PANSS PDS	PS: *n* = 30 Female: *n* = 8 Male: *n* = 22 Mean age: 36.3 HC: *n* = 27	PS: 35.7% White British. Data on other ethnic groups not reported. HC: 57.7% White British. Data on other ethnic groups not reported.	Not reported.	IFES (Deeprose & Holmes, 2010) SUIS (Reisberg et al., 2003).	Imagery and symptomology	PS showed more intrusive imagery about future events than healthy controls. Significant positive relationship between intrusive prospective imagery and anxiety as well as posttraumatic flashbacks in individuals with PS.

Author/Year/ Location	Study design	Measures	Participant demographics	Race	Medication	Measure of imagery	Type of imagery	Main findings
			Female: *n* = 11 Male: *n* = 16 Mean age: 36.2					
Matthews et al. (2014) USA	Cross-sectional Comparative	WASI NART BPRS SAPS SANS	Experiment one: PS: *n* = 14 Female: *n* = 6 Male: *n* = 9 Mean age: 41.3 HC: *n* = 14 Female: *n* = 11 Male: *n* = 3 Mean age: 40.0	Not reported.	PS were taking antipsychotic medication.	SWM task. Experiment 1: Imagery tasks with familiar letter stimuli Experiment 2: Reaction time (RT) measures for correct trials. Imagery generation and inspection task (Zarrinpar et al., 2006)	Imagery Vividness Spatial Imagery Imagery and Symptomology	Dissociation of mental imagery from working memory in PS. Experiment one: PS demonstrated enhanced mental imagery performance. PS had faster response times compared to HC. Enhanced mental imagery in PS was accompanied by impaired WM as assessed by the delayed-response task. Experiment 2: When WM maintenance load was increased, PS no longer showed superior imagery performance.

Author/Year/ Location	Study design	Measures	Participant demographics	Race	Medication	Measure of imagery	Type of imagery	Main findings
			Experiment two: PS: *n* = 16 Female: *n* = 6 Male: *n* = 10 Mean age: 38.70 HC: *n* = 16 Female: *n* = 10 Male: *n* = 6 Mean age: 39.0			VVIQ (Marks, 1973)		
Mazhari et al. (2014) Iran	Cross-sectional Comparative	PANSS BACS	PS: *n* = 29 Female: *n* = 13 Male: *n* = 16 Mean age: 41.1	Not reported.	PS were taking antipsychotic medication.	HRT - Parson's classical hand-rotation paradigm (1994). BACS (Keefe, 2001)	Spatial imagery	PS preserved mental rotation ability but were significantly slower and accurate than HC.

Author/Year/ Location	Study design	Measures	Participant demographics	Race	Medication	Measure of imagery	Type of imagery	Main findings
			HC: *n* = 29 Female: *n* = 12 Male: *n* =17 Mean age: 37.9					Mental rotation accuracy was correlated with speed of information processing and executive functions.
Mazhari et al. (2015) Iran	Cross-sectional Comparative	SANS SAPS	PS: *n* = 20 Female: *n* = 6 Male: *n* = 14 Mean age: 32. HC: *n* =18 Female: *n* = 4 Male: *n* = 14 Mean age: 32.1	Not reported.	PS were taking antipsychotic medication (15 PS on atypical, 5 on both typical and atypical antipsychotics)	HRT ERP recordings to capture neural correlates.	Spatial imagery	PS had significantly less accurate and slower performance on the hand rotation task compared to HC.
Mazhari et al. (2016) Iran	Cross-sectional Comparative	PANSS	PS: *n* = 25 Female: *n* = 5 Male: *n* = 20	Not reported.	PS were taking antipsychotic medication (15 PS on	HRT EEG recordings	Spatial imagery	Response times for PS and relatives were significantly slower than HC ($P < 0.004$).

Author/Year/ Location	Study design	Measures	Participant demographics	Race	Medication	Measure of imagery	Type of imagery	Main findings
			Mean age: 33.4 HC: *n* = 25 Female: *n* = 5 Male: *n* = 20 Mean age: 33.4		atypical, 5 on both typical and atypical antipsychotics)			PS differed significantly from both relatives and controls in accuracy (P < 0.009).
Mintz & Alpert. (1972) USA	Cross-sectional Comparative	n/a	HPS: *n* = 20 Female: *n* = Not reported. Male: *n* = Not reported. Mean age: *n* = Not reported. NHPS *n* = 20 Female = Not reported.	Not reported.	HPS & 13 PS, a chlorpromazine equivalent dosage range of 200-1,000 NHPS: 12 participants receiving, a chlorpromazine equivalent dosage range of 120-2,400.	HPS & NHPS took part in a vividness of imagery task: individuals instructed to imagine hearing a phonograph record of "White Christmas". Concrete imagery test (Griffitts, 1924)	Imagery and symptomology	HPS had high vividness of auditory imagery, while NHPS had low vividness of auditory imagery. Significant correlation between auditory hallucinations and the vividness of produced auditory imagery. HPS had greatest difficulty to assess auditory perception.

Author/Year/ Location	Study design	Measures	Participant demographics	Race	Medication	Measure of imagery	Type of imagery	Main findings
			Male = Not reported. Mean age = Not reported. HC: *n* = 20 Female: *n* = Not reported. Male: *n* = Not reported. Mean age: = Not reported.					NHPS judged the auditory perception more accurately out of the groups.
Oertel et al. (2009) Germany	Cross-sectional Comparative	RHS, LPS 10, LPS 11, LPS 12, MWT, TMT, SPQ, SKID, PANSS,	HPS: *n* = 52 Female: *n* = 18 Male: *n* = 34 Mean age: 38.9	Not reported.	All taking medication, except 1 individual.	QMI (Sheehan, 1967)	Imagery vividness Imagery and Symptomology	Higher mental imagery vividness in relatives, high-"schizotypy" controls, and HPS compared to controls. Vividness of mental imager ywas independent of predisposition towards hallucinations and cognitive test scores.

Author/Year/ Location	Study design	Measures	Participant demographics	Race	Medication	Measure of imagery	Type of imagery	Main findings
		Edinburgh Inventory	Relatives: *n* = 44 Female: *n* = 22 Male: *n* = 22 Mean age: 41.27 High-schizoypy HC: *n* = 24 Female: *n* = 16 Male: *n* = 8 Mean age: 41.27 Low-schizotypy HC: *n* = 24 Female: *n* = 11					

Author/Year/ Location	Study design	Measures	Participant demographics	Race	Medication	Measure of imagery	Type of imagery	Main findings
			Male: *n* = 13 Mean age: 32.89					
Pillny et al. (2024)	Cross-sectional Comparative	BNSS CDSS PSYRATS SHAPS	PS: *n* = 43 Female: *n* = 15 Male: *n* = 28 Mean age: 41 HC: *n* = 43 Female: *n* = 16 Male: *n* = 27 Mean age: 41	PS: Global majority = 23% HC: Global majority = 21% Ethnic Groups not reported in text.	Not stated in text.	SUIS (Reisberg et al., 2003) German version VVQ (Kirby et al., 1988) VVIQ (Marks, 1973) PSIQ (Andrade et al., 2014)		PS have normal quantity but reduced quality of mental imagery across all sensory modalities Mental imagery vividness is reduced Reduced vividness related to low anticipatory pleasure, motivation and activity Reduced vividness may cause lack of incentive to seek pleasurable experiences

Author/Year/ Location	Study design	Measures	Participant demographics	Race	Medication	Measure of imagery	Type of imagery	Main findings
Rafford et al. (2010) Switzerland & France	Cross-sectional Comparative	fNART, BDI-II PANSS	PS: *n* = 24 Female: *n* = 8 Male: *n* = 16 Mean age: 34.71 HC: *n* = 25 Female: *n* = 10 Male: *n* = 15 Mean age: 34.56	Not reported.	All PS receiving antipsychotic medication.	Scene construction task (Hassabis et al., 2007)	Spatial imagery	PS experienced an impaired ability to richly imagine new experiences.
Sack et al. (2005) UK	Cross-sectional Comparative	SAPS SANS LSHS	PS: *n* = 50 Female: *n* = 19	Not reported.	PS taking antipsychotic medication.	QMI (Sheehan, 1967) LSHS (Launay & Slade, 1981)	Imagery vividness &	Individuals with paranoid PS reported significantly higher vividness of MI across all sensory modalities compared

Author/Year/ Location	Study design	Measures	Participant demographics	Race	Medication	Measure of imagery	Type of imagery	Main findings
			Male: *n* = 31 Mean age: 36.4 NHPS: *n* = 50 Female: *n* = 19 Male: *n* = 31 Mean age: 36.4 HC: *n* = 50 Female: *n* = 19 Male: *n* = 31 Mean age: 36.4				Imagery and symptomology	to the HC. No significant correlation found between vividness of mental imagery and hallucination. Enhanced vividness of mental imagery is independent of the severity of positive and negative symptoms.

Table Abbreviations: Anxiety/Low mood service users (A/D), Amotivation (BNSS), Brief Psychiatric Scale (BPRS), Comprehensive Assessment of Symptoms and History (CASH), Depressive Symptoms (CDSS), Chronic Schizophrenia (CS), Spatial Delayed Response Task (DRT), First Episode Psychosis (FEP), Healthy controls (HC), Hand Rotation Task (HRT), The Impact of Future Events Scale (IFES), Jigsaw Puzzle Task (JPT), Line Bisection (LB), Modified Brief Psychiatric Rating Scale (MBPRS), National Adult Reading Test (NART), Delusions Inventory (PDI), Paper Folding Test (PFT), Plymouth Sensory Imagery Questionnaire (PSIQ), Positive symptoms (PSYRATS), Ravens progressive Matrices: Assessed Visuospatial intelligence (RPM), The Scale of Assessment of Negative Symptoms (SANS), The Scale for the Assessment of Negative Symptoms (SAPS), Schizotypical Personality Questionnaire (SPQ), The Spontaneous Use of Imagery Scale (SUIS), The topography of Voices Rating Scale (TVRS), Ultra High Risk (UHR), Vividness of Visual Imagery Questionnaire (VVIQ), Questionnaire of Mental Imagery (QMI).

Table 1-3

Supplementary table of measures of imagery utilised across studies.

Imagery assessment tool	Extracted information from tool	Summary of tool	Studies which used tool	Reliability
Adaptation of the reality monitoring task described by Harvey (1985)	Measure memory for self-generated and task-generated items.	Participants were presented with 30 words. They had to decide verbally whether the words were perceived earlier, imaged earlier or whether it was a new word.	Aleman (2003) Böcker et al (2000)	Internal consistency: $\alpha > 0.75$.
Auditory modality. The auditory task – sounds presented by computer. (Adapted from Mehta et al., 1992; Aleman et al., 2000)	Measuring the interaction between imagery and perception	Participants were asked to make a comparison between imagery and perception of common objects or common sounds.	Aleman (2003)	$r = 0.80$
Autobiographical Memory Task.	Imagery vividness Examines the effect of sensory imagery manipulation	Participants retrieve and record autobiographical memories in response to sensory imagery instructions (auditory, visual, gustatory-olfactory, tactile). Memories are self-assessed based on sensory modality prominence.	Alle et al., (2020)	Not reported

Imagery assessment tool	Extracted information from tool	Summary of tool	Studies which used tool	Reliability
Gordon's Test of Visual Imagery (Richardson, 1969)	Ability to manipulate or control visual imagery.	Participants showed their ability visualise an object (or example a car), in 12 various scenes. A higher score showed a participant had good visual imagery control and ability to manipulate visual imagery.	Chandiramani & Varma, (1987) Mintz & Alpert (1972)	Internal consistency $\alpha > 0.80$.
IFES (Deeprose & Holmes, 2010)	Measures intrusiveness of imagery	Participants identified three future events (which can be negative or positive) and then responded to items which ask questions about intrusiveness of imagery.	Malcom et al., (2015)	Internal consistency: $\alpha > 0.85$.
Image of a letter (Farah, 1989) Auditory modality – participants imagined a	The task measured the interaction between imagery and perception.	Participants were asked to imagine a letter and identify the correct stimuli related to the task at hand, whilst imagining.	Böcker (2000)	Internal consistency: $\alpha > 0.75$.

Imagery assessment tool	Extracted information from tool	Summary of tool	Studies which used tool	Reliability
tone (Farah & Smith, 1983)				
Imagery generation and inspection task (Zarrinpar et al., 2006).	Mental imagery manipulation - Spatial Imagery	Participants engaged with a mental imagery and a perceptual control condition. During the testing phase, the probe (X) could occur in either an early or late position. The manipulation of the complexity of the stimuli and the position of the probe allowed measurement of performance.	Matthews et al., (2014)	Not reported
Jigsaw puzzle task (JPT) (Richardson & Vecchi's 2002)	Mental imagery manipulation.	Participants were presented with jigsaw pieces. Each participant was asked to visualise a certain object before they were presented with a scrambled, fragmented puzzle of the object. Participants were instructed to fill in the numbers of the corresponding puzzle pieces to determine the correct orientation of the puzzle.	Benson & Park (2013)	Internal consistency: $\alpha > 0.80$.

Imagery assessment tool	Extracted information from tool	Summary of tool	Studies which used tool	Reliability
Mental Simulation Task involving generating detailed narratives of everyday scenarios. (Brown et al., 2002)	Ability to elicit a detailed narrative	Participants were presented with the beginning and end of an imaginary scenario. They were asked to imagine what would have happened in between.	Huddy et al., (2016) London UK	Not reported
Modified version of Bett's Vividness of Imagery Questionnaire (Bett, 1909)	Vividness of imagery	Participants rate the vividness of mental images on a 7-point scale for different sensory modalities. Score 1 shows a perfectly clear and vivid, and score 7 for no image present at all.	Chandiramani & Varma, (1987)	Internal consistency: $\alpha = 0.85$ to 0.95, Test-retest reliability: $r = 0.75$ to 0.85.
Musical imagery adapted from Halpern (1988).	Measuring musical imagery	Participants mentally compared pitches of notes. In the perceptual condition, participants were presented with the song. In the imagery the song	Aleman (2003)	Internal consistency: $\alpha > 0.80$.

Imagery assessment tool	Extracted information from tool	Summary of tool	Studies which used tool	Reliability
		was not presented, and participants had to rely on their musical imagery.		
Object imagery task – adapted from Mehta et al., (1992).	Comparison between imagery and non-imagery conditions using object names and line drawings.	Participants were asked to identify objects that did not fit with the current theme. In the imagery condition participants visualised object names, while in the non-imagery condition, they observed line drawings.	Aleman (2005).	Not reported
Objection recognition, (Snodgrass & Vanderwart, 1980).	Recognition of living/non-living items with relative size judgment.	The task consisted of line drawings. Participants had to decide whether an item was living or non-living as well as judging its size in comparison to a cat.	Doniger et al., (2001) Aleman (2003) David & Cutting (1992).	Test-retest reliability $r = 0.80$
Paper folding test (PFT) Ekstrom et al., 1976) .	Transformation of mental imagery	This test consisted of 20 multiple-choice trials mentally. Performance is measured based on the number of correct solutions within a time limit.	Benson & Park (2013)	Test-retest reliability: $r > 0.80$.

Imagery assessment tool	Extracted information from tool	Summary of tool	Studies which used tool	Reliability
Parson's classical hand-rotation paradigm (1994).	Spatial imagery task involving judging hand orientation.	Participants judged left or right-hand rotation at various angles. Response time and accuracy rate (percentage of correct response) were recorded.	Mazhouri et al., (2014;2015;2016) Ba et al., (2022).	Test-retest reliability $r = 0.85$.
Perception: Staircase (de Haan et al., 1995)	Imagery vividness	In the perception staircase method, participants detect target stimuli while imaging or not imaging a stimulus. Performance is measured using absolute thresholds and detection rates.	Böcker et al., (2000)	Not reported.
Questionnaire upon Mental Imagery QMI (Sheehan, 1967)	Imagery vividness	This is a self-report measure consisting of 35 statements regarding the imagery ability in different sensory modalities (visual, auditory, olfactory, cutaneous, kinaesthetic, gustatory, and organic) A low score on the QMI indicated more vivid imagery.	Sack et al., (2005) Oertel et al., (2009)	Internal consistency: $\alpha > 0.85$.

Imagery assessment tool	Extracted information from tool	Summary of tool	Studies which used tool	Reliability
Raven's Standard Progressive Matrices (RPM) (Raven et al., 2003).	Mental imagery manipulation - Visuospatial intelligence task.	Participant completed 60 matrices using mental imagery without working memory maintenance, which was timed.	Benson & Park (2013)	Internal consistency: $\alpha > 0.90$.
Ravens progressive Matrices: Assessed Visuospatial intelligence (RPM) (Raven et al., 2003)	Ability of visuospatial Visual problem solving	Participants took part in a multiple-choice task. They are presented with simple stimuli (two-dimensional designs). Participants responded whether the design is consistent with the rule. The tasks become progressively harder in difficulty.	Benson & Park (2013).	Internal consistency: $\alpha > 0.90$.
Verbalizer-Visualizer Questionnaire (VVQ; Kirby et al., 1988).	Preference for verbal and visual Thinking styles	The VVQ includes two subscales comprising 20 items of which 10 tap into visual processing and 10 into verbal processing	Pillny et al., (2024)	Cronbach's $\alpha = 0.70$ - 0.85
Plymouth Sensory Imagery Questionnaire	Ability of sensory Imagery	The PSIQ includes 35 items relating to sensory modalities of mental imagery. For each modality	Pillny et al., (2024)	Cronbach's $\alpha = 0.97$

Imagery assessment tool	Extracted information from tool	Summary of tool	Studies which used tool	Reliability
(psi-q) (Andrade et al., 2014)		participants are asked to imagine five distinct scenes, sensations, feelings or objects and to rate the bividness of each mental image on a scale from 0 (no image at all) to 10 (as vivid in real life). The scale mean score Cronbach' $a = .97$		Internal consistency: $\alpha > 0.80$
Reality monitoring task (Brebion et al., 1996)	Measure memory for self-generated and task-generated items.	Participants decided which stimuli was perceived or imagined across various categories such as furniture or fruits. Discrimination index measures reality monitoring abilities.	Brebion (1997)	$r = 0.75$ Internal consistency $\alpha = 97$
Reality monitoring task (Johnson et al., 1981)	Measure memory for self-generated and task-generated items.	Participants produced answers to category cues and paired associates. After this task, a source-identification task was conducted.	Bentall (1991)	Internal consistency: $\alpha > 0.75$.

Imagery assessment tool	Extracted information from tool	Summary of tool	Studies which used tool	Reliability
Sixteen categories (Battig & Montague, 1969).	Discrimination ability between imagined and perceived pictures.	Different categories as words and pictures are presented to participants. After, they were tested on recognition. Participants were required to distinguish between imagined and perceived pictures.	Brebion et al., (2008) UK	Not reported
Spatial imagery task - adapted from Kosslyn et al., (1988).	Comparison of imagery and no-imagery condition involving letter grid assessment.	Participants established if an 'X' symbol falls on a capital letter in a grid assessment. Imagery and non-imagery conditions were compared.	Aleman (2005). Aleman (2003)	Internal consistency: $\alpha > 0.80$.
The Spontaneous Use of Imagery Scale (SUIS; Reisberg et al., 2003)	Measures day-day non affective imagery	This scale measures day to day non affective imagery using 12 items. A higher score obtained, shows participant uses a greater amount of day-day imagery.	Malcom et al., (2015) Pillny et al., (2024)	Internal consistency: $\alpha > 0.80$.

Imagery assessment tool	Extracted information from tool	Summary of tool	Studies which used tool	Reliability
The visual and auditory *triad comparison* task adapted from Mehta et al.,(1992).	Vividness of imagery	Participants were asked to compare imagery and perception of visual form characteristics or sound characteristics. Vividness of imagery is assessed based on differences in correct responses between imagery and perception conditions.	Aleman (2003) Böcker (2000)	Internal consistency: $\alpha > 0.80$.
Verbal memory task (Thorndike & Lorge, 1944)	Ability of verbal memory	Participants took part in a verbal memory task with immediate and delayed recall conditions. The number of correct answers was monitored.	Brebion et al., (1997)	Test-retest reliability: $r > 0.75$.
Viewer and Object mental rotation tasks (Pellizzer et al., 2009).	Spatial/object rotation tasks.	Participants in the viewer-object rotation tasks were instructed to imagine themselves or object turning around the table until they had reached the location indicated by the arrow.	Ba et al., (2022)	Not reported
Vividness of imagery questionnaire (VVIQ; Marks, 1973).	Vividness of imagery	Participants rate the vividness of mental images imagined on a 5-point scale. . 1 representing the most vivid imagery (as clear as normal vision) and	Matthews et al., (2013). Pillny et al., (2024)	Internal consistency: $\alpha > 0.85$.

Imagery assessment tool	Extracted information from tool	Summary of tool	Studies which used tool	Reliability
		5 representing the least vivid image (no image at all)		
White Christmas task	Ability to assess the level of vividness in their auditory imagery modality	Participants instructed to imagine hearing a phonograph record of “White Christmas”.	Mintz & Alpert (1972)	Not reported

Table 1-4

JBI Critical Appraisal Checklist ratings (Peter et al., 2016).

Records	1. Were the criteria for inclusion in the sample clearly defined?	2. Were the study subjects and the setting described in detail?	3. Was the exposure measured in a valid and reliable way?	4. Were objective, standard criteria used for measurement of the condition?	5. Were confounding factors identified?	6. Were strategies to deal with confounding factors stated?	7. Were the outcomes measured in a valid and reliable way?	8. Was appropriate statistical analysis used?	Total Scores	Total possible score	Total score summary
Aleman (2003)	Y	Y	Y	Y	N	N	Y	Y	6.0	8.0	75.0%
Aleman (2005)	Y	Y	U	Y	Y	Y	U	Y	7.0	8.0	87.5%
Alle et al. (2020)	Y	Y	U	U	N	N	U	Y	4.5	8.0	56.25%
Ba et al. (2020)	Y	Y	U	Y	Y	Y	U	Y	7.0	8.0	87.5%

Records	1. Were the criteria for inclusion in the sample clearly defined?	2. Were the study subjects and the setting described in detail?	3. Was the exposure measured in a valid and reliable way?	4. Were objective, standard criteria used for measurement of the condition?	5. Were confounding factors identified?	6. Were strategies to deal with confounding factors stated?	7. Were the outcomes measured in a valid and reliable way?	8. Was appropriate statistical analysis used?	Total Scores	Total possible score	Total score summary
Benson & Park (2013)	Y	Y	U	Y	Y	Y	U	Y	6.5	8.0	87.5%
Bentall (1991)	Y	Y	U	Y	Y	N	U	Y	6.0	8.0	75.0%
Böcker et al. (2000)	Y	Y	U	U	Y	Y	U	Y	6.5	8.0	81.25%
Brébion et al. (2011)	Y	Y	U	Y	Y	N	U	Y	6.0	8.0	75.0%
Brébion et al. (1997)	Y	Y	U	Y	Y	N	U	Y	6.0	8.0	75.0%

Records	1. Were the criteria for inclusion in the sample clearly defined?	2. Were the study subjects and the setting described in detail?	3. Was the exposure measured in a valid and reliable way?	4. Were objective, standard criteria used for measurement of the condition?	5. Were confounding factors identified?	6. Were strategies to deal with confounding factors stated?	7. Were the outcomes measured in a valid and reliable way?	8. Was appropriate statistical analysis used?	Total Scores	Total possible score	Total score summary
Brébion et al. (2008)	Y	Y	Y	Y	N	N	Y	Y	6.0	8.0	75.0%
Chandiramni & Varma (1987)	Y	Y	U	Y	N	N	U	Y	5.0	8.0	62.5%
David & Cutting (1992)	Y	Y	U	Y	Y	Y	U	Y	7.0	8.0	87.5%
Doniger (2001)	Y	Y	Y	Y	U	U	Y	Y	7.0	8.0	87.5%
Huddy et al., (2016)	Y	Y	U	Y	Y	N	U	Y	6.0	8.0	75.0%
Malcolm et al., (2015)	Y	Y	U	Y	Y	Y	U	Y	7.0	8.0	87.5%

Records	1. Were the criteria for inclusion in the sample clearly defined?	2. Were the study subjects and the setting described in detail?	3. Was the exposure measured in a valid and reliable way?	4. Were objective, standard criteria used for measurement of the condition?	5. Were confounding factors identified?	6. Were strategies to deal with confounding factors stated?	7. Were the outcomes measured in a valid and reliable way?	8. Was appropriate statistical analysis used?	Total Scores	Total possible score	Total score summary
Matthews et al., (2014)	Y	Y	U	Y	Y	N	U	Y	5.5	8.0	68.75%
Mazhari et al., (2014)	Y	Y	Y	Y	Y	N	Y	Y	7.0	8.0	87.5%
Mazhari et al., (2015)	Y	Y	Y	Y	Y	N	Y	Y	7.0	8.0	87.5%
Mazhari et al., (2016)	Y	Y	Y	Y	Y	N	Y	Y	7.0	8.0	87.5%
Mintz & Alpert, (1972)	Y	Y	U	Y	N	N	U	U	4.5	8.0	56.25%
Oertel et al., (2009)	Y	Y	U	Y	Y	Y	U	Y	7.0	8.0	87.5%

Records	1. Were the criteria for inclusion in the sample clearly defined?	2. Were the study subjects and the setting described in detail?	3. Was the exposure measured in a valid and reliable way?	4. Were objective, standard criteria used for measurement of the condition?	5. Were confounding factors identified?	6. Were strategies to deal with confounding factors stated?	7. Were the outcomes measured in a valid and reliable way?	8. Was appropriate statistical analysis used?	Total Scores	Total possible score	Total score summary
Pillny (2024)	Y	Y	Y	Y	N	N	Y	Y	6.0	8.0	75.0%
Rafford et al., (2010)	Y	Y	U	Y	N	N	U	Y	5.0	8.0	62.5%
Sack et al., (2005)	Y	U	U	Y	Y	Y	U	Y	6.5	8.0	81.25%

Table Abbreviations: Yes (Y), Unclear (U), No (N)
Y = 1
U = 0.5
N = 0

Appendices

Appendix 1-A

JBI – Critical Appraisal Checklist for Analytic Cross-Sectional Studies

JBI Critical Appraisal Checklist for Analytical Cross Sectional Studies

Reviewer_____Date_____

Author _____Year_____Record Number_____.

	Yes	No	Unclear	Not applicable
1. Were the criteria for inclusion in the sample clearly defined?	☐	☐	☐	☐
2. Were the study subjects and the setting described in detail?	☐	☐	☐	☐
3. Was the exposure measured in a valid and reliable way?	☐	☐	☐	☐
4. Were objective, standard criteria used for measurement of the condition?	☐	☐	☐	☐
5. Were confounding factors identified?	☐	☐	☐	☐
6. Were strategies to deal with confounding factors stated?	☐	☐	☐	☐
7. Were the outcomes measured in a valid and reliable way?	☐	☐	☐	☐
8. Was appropriate statistical analysis used?	☐	☐	☐	☐

Overall appraisal: Include ☐ Exclude ☐ Seek further info ☐

Comments (Including reason for exclusion)

_____

_____

_____

Appendix 1-B
Author guidelines for the Journal of Affective Disorders

About the journal

Aims and scope

Journal of Anxiety Disorders is an interdisciplinary journal that publishes research papers dealing with all aspects of anxiety disorders for all age groups (child, adolescent, adult and geriatric). Manuscripts that focus on disorders formerly categorized as anxiety disorders (obsessive-compulsive disorder, posttraumatic stress disorder) and the new category of illness anxiety disorder are also within the scope of the journal. Research areas of focus include: traditional, behavioral, cognitive and biological assessment; diagnosis and classification; psychosocial and psychopharmacological treatment; genetics; epidemiology; and prevention. Theoretical and review articles that contribute substantially to current knowledge in the field are appropriate for submission.

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Article types

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All authors should have made substantial contributions to all of the following:

1. The conception and design of the study, or acquisition of data, or analysis and interpretation of data.
2. Drafting the article or revising it critically for important intellectual content.
3. Final approval of the version to be submitted.

All authors should agree to be accountable for all aspects of the work to ensure that the questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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- Any authorship change requests approved by the journal editor will result in a corrigendum if the manuscript has already been published.

- Any unauthorised authorship changes may result in the rejection of the article, or retraction, if the article has already been published.

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- Employment
- Consultancies
- Stock ownership
- Honoraria
- Paid expert testimony
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The resulting Word document containing your declaration should be uploaded at the "attach/upload files" step in the submission process. It is important that the Word document is saved in the .doc/.docx file format. Author signatures are not required.

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Authors must disclose any funding sources who provided financial support for the conduct of the research and/or preparation of the article. The role of sponsors, if any, should be declared in relation to the study design, collection, analysis and interpretation of data, writing of the report and decision to submit the article for publication. If funding sources had no such involvement this should be stated in your submission.

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Funding: This work was supported by the National Institutes of Health [grant numbers xxxx, yyyy]; the Bill & Melinda Gates Foundation, Seattle, WA [grant number zzzz]; and the United States Institutes of Peace [grant number aaaa].

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Inclusive language acknowledges diversity, conveys respect to all people, is sensitive to differences, and promotes equal opportunities. Authors should ensure their work uses inclusive language throughout and contains nothing which might imply one individual is superior to another on the grounds of:

- Age
- Gender
- Race
- Ethnicity
- Culture

- Sexual orientation
- Disability or health condition

We recommend avoiding the use of descriptors about personal attributes unless they are relevant and valid. Write for gender neutrality with the use of plural nouns ("clinicians, patients/clients") as default. Wherever possible, avoid using "he, she," or "he/she."

No assumptions should be made about the beliefs of readers and writing should be free from bias, stereotypes, slang, reference to dominant culture and/or cultural assumptions.

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There is no single, universally agreed-upon set of guidelines for defining sex and gender. We offer the following guidance:

- Sex and gender-based analyses (SGBA) should be integrated into research design when research involves or pertains to humans, animals or eukaryotic cells. This should be done in accordance with any requirements set by funders or sponsors and best practices within a field.
- Sex and/or gender dimensions of the research should be addressed within the article or declared as a limitation to the generalizability of the research.
- Definitions of sex and/or gender applied should be explicitly stated to enhance the precision, rigor and reproducibility of the research and to avoid ambiguity or conflation of terms and the constructs to which they refer.

We advise you to read the Sex and Gender Equity in Research (SAGER) guidelines and the SAGER checklist(PDF) on the EASE website, which offer systematic approaches to the use of sex and gender information in study design, data analysis, outcome reporting and research interpretation.

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- Submit your graphical abstract as a separate file in the online submission system.
- Ensure the image is a minimum of 531 x 1328 pixels (h x w) or proportionally more and is readable at a size of 5 x 13 cm using a regular screen resolution of 96 dpi.
- Our preferred file types for graphical abstracts are TIFF, EPS, PDF or MS Office files.

We encourage you to view example graphical abstracts and read about the benefits of including them.

Math formulae

- Submit math equations as editable text, not as images.
- Present simple formulae in line with normal text, where possible.

- Use the solidus (/) instead of a horizontal line for small fractional terms such as X/Y.
- Present variables in italics.
- Denote powers of e by exp.
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- Number tables consecutively according to their appearance in the text.
- Please provide captions along with the tables.
- Place any table notes below the table body.
- Avoid vertical rules and shading within table cells.

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When your artwork is finalized, "save as" or convert your electronic artwork to the formats listed below taking into account the given resolution requirements for line drawings, halftones, and line/halftone combinations:

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- Provide updated files if at any stage of the publication process you wish to make changes to submitted supplementary materials.
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Acknowledgements

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Paper Two: Research Paper

A Pilot Study of a Positive Mental Imagery intervention for targeting suicidal ideation in Psychosis: Lessons Learned and Guidelines for Future Feasibility Research

Word count (excluding references, tables and appendices): 6030

Abstract: 236

Claudia Daley

Doctorate in Clinical Psychology

Division of Health Research, Lancaster University

Prepared for submission to: Journal of Affective Disorders.

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1. Abstract

Purpose:

Suicide is a global issue and a leading cause of premature death in individuals with psychosis. There is a lack of brief interventions which target suicidality in this population. This study explored the acceptability and feasibility of a positive mental imagery intervention called the Broad-Minded Affective Coping Strategy in people with psychosis and suicidal thoughts. The study examined barriers and potential adaptations for future feasibility trials in this population.

Methods:

Participants were recruited from community mental health teams. The positive mental imagery intervention consisted of six weekly individual therapy sessions administered by a trainee clinical psychologist. Therapy sessions explored positive memories, during which participants engaged with their senses to replay them. This aimed to improve emotional regulation, reduce distress and decrease suicidality. Outcome data were collected at baseline, six weeks post-intervention, and at a 12-week follow-up.

Results:

Three participants consented to participate and received the intervention. Two participants completed follow-up measures. These participants were highly satisfied with the intervention. However, recruitment barriers and low recruitment rates limited the ability to assess acceptability and feasibility comprehensively.

Discussion:

The pilot study highlights the current difficulties in recruitment within this population group. The limitations included a small sample size and a lack of a control group. The lessons learned provide valuable insights to inform future feasibility studies. Research focusing on a larger-scale pilot study would help determine further acceptability and feasibility of this approach.

Keywords: Broad-minded affective coping, positive mental imagery, suicidality, suicide prevention, psychosis, schizophrenia

2. Introduction

More than 700,000 lives are lost to suicide globally per year (WHO, 2023). Suicide is a leading cause of death in individuals with psychosis (Olfson et al., 2021). Approximately four people per 1000 in the general population are affected by psychosis (Moreno-Küstner et al., 2018). Psychosis can severely impact an individual's quality of life (Mao et al., 2023) and affect the whole family system (Estradé et al., 2023). Common experiences include hallucinations, disordered thinking, delusions, and emotional withdrawal (Calabrese & Al Khalili, 2019). Many individuals with psychosis (40-79%) experience suicidal ideation (Fenton et al., 1997; Skoldar et al., 2008), a well-established risk factor for suicidal behaviour (Ribeiro et al., 2016). People diagnosed with psychosis experience a four-fold risk of suicide in comparison to the general population (Yates et al., 2019). Given this strong association, it is vital to develop interventions that target suicidality in this group (Gooding et al., 2020).

Positive affect is inversely related to suicidal ideation. People who frequently experience positive emotions are less likely to experience suicidality (Teismann et al., 2019). Positive imagery can be defined as the mental simulation of imagery which is associated with positive feelings (Blackwell & Holmes, 2017). The absence of positive imagery and the presence of negative intrusive imagery both maintain a depressed mood (Holmes et al., 2009).

Mental imagery can induce emotions comparable to real-life experiences (Carver & Scheier, 2000). Mental imagery can be defined as sensory information from an individual's memory that creates a re-experienced version of an original or novel stimulus in the 'mind's eye' (Pearson et al., 2015). Imagining positive life experiences has more impact than processing such events verbally (Holmes et al., 2009). Positive psychology is gaining momentum as a framework for treating suicidality (Pearson et al., 2015). Mental health research has traditionally used a pathological approach to treat distress, focussing on eliminating negative emotions (Goldiamond, 1975). In contrast, positive psychology aims to create new functional behaviour rather than eliminate "the problem" (Tarrier, 2010). The broaden-and-build theory (Fredrickson, 1998) states that positive emotions help widen individuals' thoughts and actions, named "thought-action repertoires". These thought-action repertoires help build physical, intellectual, social, and psychological resources that aid individual survival (Fredrickson, 2011). Positive emotions help to build hope and the ability to act autonomously and freely, which can support suicide prevention (Chang et al., 2021).

The Differential Activation Theory (DAT; Teasdale, 1998) explains how positive emotions can help support suicide prevention. It suggests that in depression, connections are formed between low moods, negative dysfunctional beliefs and cognitive processing biases. Each time an individual enters a low mood, this connection strengthens and becomes more accessible. Therefore, a slight shift in an individual's mood can initiate negative thinking patterns (Segal et al., 1996). Garland et al. (2010) proposed that eliciting positive affect can help individuals exit from negative thinking patterns and buffer against negative emotions.

Psychological talking therapies such as Cognitive-Behavioural Suicide Prevention (CBSP) have been developed to target suicidality in individuals. CBSP is a long-term (20-session) therapeutic intervention which targets the fundamental psychological mechanisms that drive suicidality, such as defeat, entrapment, and hopelessness (Tarrier et al., 2013). CBSP mainly focuses on targeting cognitive distortions and negative thinking patterns. It has been shown to reduce feelings of suicidality and has been demonstrated to be an acceptable and feasible approach across three pilot randomised control trials in people with psychosis (Tarrier et al., 2014; Awenat et al., 2017), male prisoners (Pratt et al., 2015), and people in a psychiatric inpatient setting (Haddock et al., 2019). One intervention technique occasionally used within CBSP is the broad-minded affective coping technique (BMAC; Tarrier, 2010). This is a brief strategy from cognitive behavioural therapy (CBT). The BMAC can be a stand-alone technique or easily incorporated into various therapeutic interventions (Panagioti et al., 2012). It encourages the utilisation of positive memories, mental imagery, and cognitions to aid the development of positive affect in individuals (Holden et al., 2016). The therapist guides individuals to re-experience a positive memory in detail by engaging with the five senses and processing the personal meaning behind the memory (see Table 2-1). This helps to counteract their negative thoughts and feelings (Holden et al., 2016). The BMAC aims: 1) to help increase the client's access to positive experiences, memories, and emotions, 2) to enhance tools for coping during times of distress, aiding emotional regulation, 3) to develop a sense of control over one's thoughts and emotions (Tarrier et al., 2010).

The BMAC, as a standalone intervention, has been utilised across a range of mental health difficulties and has been shown to be promising in individuals with PTSD (Panagioti et al., 2012), psychosis (Johnson et al., 2012; Mote & Kring, 2019), university students (Alejandro et al., 2023; Holden et al., 2017; Knagg et al., 2022) and individuals experiencing suicidal thoughts or behaviours (Pratt et al., 2022; Kangg et al., 2022; Mitchell 2020; Duddridge 2013; Tarrier et al., 2014). The BMAC holds benefits, being a low-level, time-

limited technique that a range of professionals can implement. Studies exploring the BMAC in individuals with psychosis (Johnson et al., 2012) have previously only administered the BMAC strategy once and did not include a follow-up in their design. It is recommended that the BMAC is administered multiple times to participants to be effective (Tarrier et al., 2010). Therefore, the acceptability and feasibility of the BMAC method over time in individuals with psychosis and suicidality is currently unknown.

This pilot study aimed to assess the acceptability and feasibility of providing a brief intervention to individuals with psychosis experiencing suicidal ideation and/or behaviour. The structure of the intervention was guided by a six-session intervention manual that was previously successfully implemented with students experiencing suicidality (Knagg et al., 2022).

The study aimed to determine the rates of recruitment, retention, and engagement as well as gather feedback on the intervention's use. It also aimed to explore the initial promise of the intervention in terms of change in clinical outcomes and areas for adaption for the intervention manual to be better suited to people with psychosis. The study encountered challenges and focused on lessons learned about the intervention development, recruitment and evaluation to inform future feasibility studies.

4. Method

3.1 Design

The initial design of the study was a pilot feasibility study, which aimed to explore the acceptability and feasibility of the Broad-minded affective coping intervention for individuals with psychosis and suicidality by recruiting 5-10 participants. However, barriers and challenges to recruitment were encountered, and only three participants were recruited for the study, with two participants completing follow-up questionnaires. This meant the study's focus changed to exploring recruitment difficulties, lessons learned and how this intervention could be adapted for future pilot studies in this population group.

3.2 Ethics

Lancaster University sponsored the study. Lancashire & South Cumbria NHS Foundation Trust and Northwest Preston Research Ethics Committee reviewed the study: 23/NW/0151 (See Section Four for Ethics report).

3.3 Participants

We aimed to recruit 5-10 participants from the Community Mental Health Team (CMHT) or Early Intervention for psychosis service (EIS) across Northwest England. Despite

efforts to promote the study, such as the use of promotional posters in services and the trainee visiting several services to talk about the study, recruitment challenges meant that only three participants were recruited. Participants had to meet the operational criteria for an early intervention service, which was scoring three or above on the relevant items on The Positive and Negative Syndrome Scale (PANSS; Kay et al., 1987) items or had a diagnosis of a non-affective psychotic disorder (e.g. schizophrenia, schizoaffective disorder, delusional disorder, schizophreniform disorder) by the International Statistical Classification of Diseases and Related Health Problems (ICD). The relevant ICD codes for inclusion were F20: Schizophrenia, F21: Schizotypal disorder, F22: Persistent delusional disorders, F23: Acute and transient psychotic disorders, F25: Schizoaffective disorders, F28: Other nonorganic psychotic disorders, F29: Unspecified nonorganic psychosis. Individuals who were at ultra-high risk of developing psychosis were not included in the study. Qualified psychiatrists made and recorded the diagnoses and ICD codes within the services. Participants also had to meet the inclusion criteria of experiencing suicidal ideation and/or behaviour in the past three months. The following screening questions confirmed this: "Have you had any thoughts about ending your life in the past three months?" and "Have you attempted to end your life in the past three months?". Endorsement of either item meant that participants qualified for the study. This is consistent with previous studies that have explored the BMAC in individuals with suicidality (Knagg et al., 2022; Taylor et al., 2023).

The exclusion criteria included: i) a diagnosis of bipolar disorder; ii) a known moderate to severe learning disability (IQ:<70); iii) A known diagnosis of Autism; iv) Organic cerebral disease/injury affecting receptive and expressive language comprehension; v) Organic Psychosis; vi) Non-English speaking to the degree that the participant is unable to answer questions and give written informed consent; vii) Lack of capacity to consent; viii) The imminent and immediate risk to self or others, operationalised as the presence of active intent or planning to harm oneself or others soon (e.g. next month).

3.4 Materials

At the baseline session, participants completed a demographic questionnaire covering gender, sexuality, ethnicity, marital status, diagnoses of physical health or mental health conditions, current and past therapy services accessed, current and past medication for mental health difficulties, and history of hospital admissions.

3.5 Baseline Measures

The Psychotic Symptom Rating Scale (PSYRATS; Haddock et al., 1999) is a structured interview that was used to measure the dimensions of delusional beliefs and auditory hallucinations. The tool consists of 17 items, which examine hallucinations and delusions on a 4-point scale from 0 (absent) to 4 (severe). For most questions, participants are asked to reflect on symptoms over the past week (See Appendix 2A). This measure is commonly used within research and clinical settings (Woodward et al., 2014) and shows good inter-rater reliability, internal consistency, and re-test reliability (Drake et al., 2007).

3.6 Feasibility outcome measures

Feasibility was measured by i) rates of recruitment over 6 months ii) the number of sessions attended, iii) the completion of tasks allocated to participants outside of sessions, iv) attrition at follow-up and post-treatment (12 weeks) and v) the amount of missing data. We aimed to recruit 5-10 individuals for the study. Feasibility was assessed based on treatment adherence and attrition at follow-up.

3.7 Acceptability Outcome Measures

The researcher completed a therapy adherence schedule at the end of each session. The schedule included recording the delivered intervention's date, time, purpose, and content. The Client Satisfaction Questionnaire (CSQ-8; Larson et al., 1979) is a self-report measure utilised to determine satisfaction after the intervention sessions (See Appendix 2B). The scale consists of 8 questions completed on a 4-point scale. Final scores can vary from 8 to 32. A lower overall score implies less service satisfaction, while a higher score indicates greater satisfaction. A mean score of 21 or over indicates the acceptability of the method (Kelly et al., 2017). The CSQ-8 (Larson et al., 1979) is commonly utilised across the literature and demonstrates a high internal consistency (coefficient $\alpha = .91$) in measuring therapy satisfaction (Attiksson & Zwick et al., 1982).

The Acceptability of Intervention Measure (AIM), Intervention Appropriateness Measure (IAM), and Feasibility of Intervention Measure (FIM) (AIM, IAM, FIM: Weiner et al., 2017) are self-report measures which help to determine the acceptability, appropriateness, and feasibility of the intervention for participants (see Appendix 2C). Each scale consists of four-item measures that help determine the success of implementation (Proctor et al., 2011). Each scale value ranges from 1 to 5 (From ‘completely disagree’ to ‘agree’). The AIM, IAM and FIM (Weiner et al., 2017) have good psychometric properties, demonstrating high

internal consistency (α = 0.81– 0.85). Additionally, good test re-test reliability with coefficients ranged from 0.73-0.88 (Weiner et al., 2017).

3.8 Outcome measures

The Beck Scale for Suicidal Ideation (BSS; Beck & Steer, 1991) is a self-report measure administered to participants to assess suicidality throughout the BMAC intervention. It consists of 21 questions that measure suicidality in the past week. It is a reliable measure with various population groups and studies have supported the use of the BSS with individuals with psychosis (Pinniti et al., 2002). It has demonstrated good internal consistency in a sample experiencing clinical risk (α = .96) as well as high levels of test-retest reliability $r = 0.88$ (Pinninti et al., 2002). The BSS has been shown to be correlated with suicide attempts $r = 0.45$, $p < 0.001$. This measure was included to monitor risk and suicidality throughout the study.

The Beck Hopelessness Scale (BHS; Beck & Steer, 1988) is a self-report questionnaire administered to participants to assess hopelessness and negative feelings about the future. It includes 20 statements that participants responded with true or false. The BHS is a valid measure of hopelessness across multiple population groups. It has an excellent Cronbach alpha level of α =.87 (Kliem et al., 2018). The BHS has been shown to be a reliable method for assessing mood in individuals with psychosis. (Kao et al., 2012). Hopelessness has been demonstrated to be a risk factor for suicidality, and the BHS has been shown to be associated with suicidality (Beck et al., 1985). This measure was utilised to monitor risk and suicidality throughout the study.

The Perceived Control of Internal States Scale (PCOISS; Pallant, 2000) is a self-report measure that assesses how participants felt they could control their internal states (emotions, thoughts, physical reactions), with 18 items (See Appendix 2D). This was used to measure perceived control, as it is hypothesised that the BMAC counteracts suicidality by increasing an individual's access to perceived control over thoughts and emotions (Knagg et al., 2022). It has demonstrated excellent internal consistency (α=.92) and a mean inter-item correlation of .41 (Pallant, 2000).

The Generalised Anxiety Disorder Assessment-7 (GAD-7; Spitzer et al., 2006) and The Patient Health Questionnaire-9 (PHQ-9; Kroenke et al., 2001) were used to measure psychological distress throughout the BMAC intervention. Anxiety and depression are related to psychotic symptom severity, distress, prognosis, and relapse (Hartley & Haddock et al., 2013). Therefore, it was important to monitor throughout the intervention. The Generalised

Anxiety Disorder Assessment-7 (GAD-7; Spitzer et al., 2006) is a self-report measure administered to participants to assess current anxiety levels throughout the BMAC. The GAD-7 (Spitzer et al., 2005) contains seven questions to determine symptoms of a generalised anxiety disorder (See Appendix 2E). The GAD-7 has excellent internal consistency and convergent validity, with a Cronbach alpha level of $\alpha = 0.82$ (Johnson et al., 2019).

The Patient Health Questionnaire -9 (PHQ-9; Kroenke et al., 2001) is a self-report questionnaire administered to participants to assess the level of depression present within individuals (See Appendix 2F). The PHQ-9 (Kroenke et al., 2011) has demonstrated good reliability and validity in a psychiatric sample. The tool has demonstrated good internal consistency (α=.87) (Beard et al., 2016). This measure was also utilised as a sessional measure.

3.9 Procedure

Professionals at CMHT/integrated care hubs or early intervention for psychosis services identified, approached, and referred participants. Participants also had the option to self-refer. Promotional posters were placed in care-provider settings. (Appendix 2G). Participants were informed they would be reimbursed with a ten-pound gift voucher for assessment at six weeks and another ten-pound gift voucher for assessment at 12 weeks (follow-up) as compensation for participating.

Individuals interested in the study were offered a phone call with the first author (CD) to determine their eligibility. Participants were sent the participant information sheet, which explained the study in additional detail via email, or they may have received a physical copy from their care provider (Appendix 2H). Participants were allowed to attend sessions online or in person (either at their home, care provider setting or GP surgery). The intervention was delivered according to client preference to allow flexibility.

Eligible individuals provided full written consent at the start of the baseline session (see Appendix 2I). Demographic information (See Appendix 2J), a risk assessment, and the PSYRATS (Haddock et al., 2009) were conducted during the baseline assessment. Multiple questionnaires were administered to participants during the baseline assessment (See measures). The PHQ-9 (Kroenke et al., 2001) were administered as a sessional measure to participants to determine changes in mood and suicidality throughout the intervention. Participants' risk was also continuously discussed and managed. Participants attended clinical

outcome measure sessions at baseline, post-intervention (after six weeks), and at a 12-week follow-up.

3.10 Patient and Public Involvement

Individuals from the Lancaster University Public Involvement Network (LUPIN) were consulted before the study. LUPIN is a programme for current and former clients of clinical psychological services. During the consultation, it was highlighted the importance of exploring with participants if they were experiencing any hallucinations at present, as this may interfere with the positive imagery intervention. This was explored with individuals before starting the positive mental imagery intervention through the administration of the PSYRATS at baseline (Haddock et al., 1999).

3.11 Intervention

The intervention included six one-hour individual therapy sessions over six weeks. This followed the same structure as Knagg et al. (2022) single-armed pilot study, which was successfully delivered to suicidal students. Most sessions occurred face-to-face (following the client's preference) in the client's care provider setting. Sessions occasionally occurred on the video platform Microsoft Teams due to the client's preference or room availability. The intervention delivery consisted of building rapport with the client, providing a rationale of the BMAC (socialisation to the exercise), a relaxation exercise, delivering the positive mental imagery exercise, feedback and debriefing of the BMAC exercise, and reviewing the progress and future practice of the BMAC. Participants were given materials to aid practice between sessions, such as a prompt sheet (See Appendix 2K) and a voice recording of the BMAC. Participants also had the option to record the BMAC exercise in the session so they could listen back to the recording in their own time. When participants had completed six therapy sessions, the researcher put together a therapy blueprint for participants (See Appendix 2L). The therapy blueprint is a document of work covered in the sessions and what clients have found challenging and helpful going forward.

3.12 Delivery of Intervention

The BMAC intervention, a novel intervention derived from CBT therapy, was delivered by a trainee clinical psychologist (CD) with previous experience managing distress and risk. CD attended a one-day training session on the BMAC technique, which was prepared by clinical psychologists and experts in the area. CD also met with an experienced social worker to practice the BMAC technique and receive feedback. Similarly, CD met with her supervisor

(JPC) multiple times to practice the intervention and studied video examples from experts within the area prior to delivery with participants.

3.13 Analysis

The analysis was performed in IBM SPSS Statistics (Version 29). The Wilcoxon signed-rank test was used to analyse differences in participants' assessment scores at pre-intervention and post-intervention, as well as pre-intervention and follow-up. The information was reported as summary statistics and graphical representations of the data. This pilot study was not powered to look at statistical significance or to get an accurate indication of effect sizes.

4. Results

Recruitment took place from September 2023 to March 2024. The trainee clinical psychologist visited seven services, online or in person, to speak to staff or to present the study to teams. The CONSORT diagram in Figure 2-1 demonstrates the flow of participants at different times within the intervention. Care providers invited seven individuals to participate in the study. Three individuals declined to take part, and four people expressed interest. One person disengaged in the early stages, completing telephone screening, but did not attend baseline assessment. Three individuals met the inclusion criteria and gave informed consent to participate in the study. Three participants completed the initial assessment session. Two out of three participants completed both follow-up assessment sessions after six and 12 weeks. One participant did not complete either of the follow-up assessment sessions due to a hospital admission. Please refer to Table 2-2 for demographic information of the participants.

4.2 Engagement with the intervention

Engagement with the mental imagery intervention was high, with participants attending on average, five out of six intervention sessions ($SD = 0.8$). One participant completed all six sessions, another completed five sessions, and one completed four sessions. Reasons for non-attendance to sessions were that participants were on holiday ($n = 2$) and concerns over risk ($n = 2$). Participants completed sessional measures at all BMAC intervention sessions.

4.3 Self-report measures of acceptability and feasibility

Two out of three participants completed the CSQ-8 (Larson et al., 1979) at 6 and 12 weeks. See Table 2-3 for the CSQ-8 table. The results showed that most participants rated above three out of four on all items. Participants were mostly or extremely satisfied with the

BMAC intervention. The satisfaction was maintained six weeks after the intervention had finished.

4.4 AIM, IAM and FIM

Two out of three participants completed the AIM, IAM and FIM (Weiner et al., 2017). The results are detailed in Tables 2-4. Participants showed high acceptability levels on the AIM (Weiner et al., 2017), scoring four or above out of five on all items. On the IAM (Weiner et al., 2017), all participants agreed with the appropriateness of the intervention and that it was suitable, fitting, applicable, and a good match. Additionally, on the FIM (Weiner et al., 2017), participants indicated that the intervention was implementable, possible and doable.

4.5 Clinical outcome measures

Please refer to Table 2-5 for a summary of statistics and outcome data for key variables. The current study explored the differences between baseline and post-intervention and baseline and follow-up through multiple psychometric measures. The starting and end points show different patterns across participants. For example, Participant One started with high suicidality, and Participant Three started with no suicidality. The results showed that Participants One and Three improved overall throughout the intervention. Participant One showed reduced symptom severity in BSS. Both Participants, One and Three, showed reduced symptom severity in PHQ-9 and enhanced control over their emotions on the PCOISS. Figure 2-2 illustrates the changes in PHQ-9 scores for the participants throughout the intervention. Participant Three also showed decreased anxiety on GAD-7. Participant Two required a more significant amount of data to conclude.

4.6.1 Learning & Adaptation in Intervention

Throughout the pilot study, multiple adaptations were employed to meet participants' needs. Some participants reported difficulties with engaging in relaxation techniques due to their experiences of sensory hallucinations. Participants were offered an alternative method, such as the 5-4-3-2-1 grounding technique. Participants reported that this helped them to engage with the positive mental imagery intervention. Furthermore, it was found that participants could often struggle to think of a positive memory. If this was the case, participants were asked if they would like to bring a positive future scenario, for example, something they would like to happen. This adaptation appeared to enhance motivation in some participants, prompting them to take steps towards experiencing the scenarios they had previously imagined within the intervention.

4.6.2 Collaboration with Care Coordinators

Communication between the trainee and the participants' care coordinator was highly beneficial for participant safety. Additionally, participants talked about how they found encouragement from their care coordinator helpful in facilitating practice. Therefore, it could be beneficial for future studies to invite care coordinators to a BMAC session and share the participant's therapeutic blueprint. In doing so, care coordinators would be equipped with a better understanding of the therapeutic technique and could support participants more effectively through the process.

4.6.3 Recruitment challenges

Over seven months, recruitment was primarily facilitated through engagement with care coordinators and clinicians working within these services, who identified and approached potential participants based on the inclusion criteria. Additionally, several services displayed promotional posters to inform potential participants about the study. Despite these efforts, recruitment posed significant challenges. Barriers included limited availability of staff to make referrals due to high workloads, reluctance from potential participants to engage with the study, and the therapist lacking relationships with staff to build trust for referrals. In response to these recruitment difficulties, it was emphasised to participants that the intervention could be delivered with flexibility in terms of how they could engage with the intervention. For example, participants were given the option to complete the intervention in person or virtually. Additionally, the trainee visited multiple services to promote the study to professionals. Despite these efforts, only three participants were successfully enrolled in the study, and two completed the intervention.

4.6.4 Serious Adverse Events

In this current sample, some participants displayed a high level of risk. Two serious adverse events (SAEs) were recorded and were investigated by an independent authority separate from the research team. The independent authority deemed the SAEs not associated with the current intervention. Logistical adaptations were implemented to address the high level of risk in the population group, such as check-in phone calls after sessions, reminding clients of crisis line numbers, and regular check-ins with care coordinators to update them on participants' risk. These adaptions proved highly beneficial for participant safety. During the intervention, some sessions with this population group were found to be more risk-focused, leaving less time for the intervention. Therefore, it is suggested that future pilot studies extend the sessions from six to eight to account for the risk level in this population group.

5. Discussion

The main aim of the study was to explore the acceptability and feasibility of the BMAC intervention in individuals with psychosis who have suicidal thoughts. The recruitment challenges faced, as well as the small sample size of the study, meant a statistical analysis could not be conducted. Therefore, the results of the study are tentative. Nevertheless, valuable lessons were learned that can act as future guidelines for a more extensive feasibility study.

5.1 Feasibility & Acceptability

All three participants reported enjoying the intervention. Two participants who completed follow-up measures reported high satisfaction levels on the CSQ-8 (Larson et al., 1979) and rated the intervention as acceptable, appropriate, and feasible on the AIM, IAM, and FIM (Weiner et al., 2017). These results are deemed preliminary due to the challenges with recruitment and the attrition rate. Furthermore, as the results were collected by the trainee who administered the intervention, social desirability may have influenced participants' responses, so this should also be considered when interpreting results. In future pilot studies, it would be beneficial to invite a second researcher to collect participants' responses to help mitigate the potential effects of social desirability.

5.2 Psychological Mechanisms

Within participants, it was found that there was an increase in perceived control of internal states with engagement with the positive mental imagery intervention. This provides tentative support for the underlying mechanisms of BMAC. Fredrickson's (1998) Broaden and Build Theory hypothesises that positive emotions can broaden an individual's attention and cognition, thus alleviating the focus on negative, threat-based emotions. This may enhance participants' perceived control over their emotional states (Tarrier et al., 2013) by helping participants redirect focus from intrusive or distressing thoughts to more adaptive mental imagery. This mechanism could be particularly beneficial in psychosis, where individuals often experience biases toward negative information processing (Bentall et al., 2001). The activation of positive memory networks may create a "buffering" effect, reducing the intensity and frequency of negative emotional states. This can be linked to the Differential Activation Theory (Lau et al., 2004). The differential activation theory suggests that individuals with a history of suicidality have a network of cognitive and emotional patterns that can become more accessible over time and are triggered easily by stress. The BMAC's focus on generating positive mental imagery may have disrupted these patterns by activating alternative, adaptive emotional responses, helping participants regulate distressing emotions

more effectively. However, it is essential to interpret the improvements in the current study cautiously due to the small sample size, one participant disengaged early, and no statistical analysis could be performed.

5.3 Adaptations

One of the adaptations introduced in the current study was that participants could bring a future positive scenario they would like to happen rather than a memory, which is traditionally utilised in the BMAC. Participants verbally reported that this was beneficial. This adaptation may have been helpful because individuals with psychosis often experience difficulties recalling memories due to struggling with autobiographical memory and cognitive processing (Greenland-White, 2017). Additionally, in some cases, imagining a future scenario encouraged participants to engage in this activity in the future. This aligns with research that has found that imagining positive future scenarios can lead to increased goal achievement (Knäuper et al., 2009). Another adaptation that was found helpful in the study was the introduction of the 5-4-3-2-1 grounding technique to replace the traditional relaxation exercises utilised within the BMAC (e.g., breathing or mindfulness). This could be because breathing and mindfulness exercises often focus on internal experiences, such as noticing bodily sensations or thoughts (Gibson et al., 2019). The 5-4-3-2-1 grounding technique focuses attention on the environment by using the five senses to bring clients to the present moment in a structured way (Shukla, 2020). This shift in focus could help participants feel less distressed by their internal experiences. Overall, within the study, it was found that tailoring the intervention to the participant's needs and preferences helped to enhance engagement with the technique, and it is recommended that future pilot studies explore these adaptations further within a larger number of participants.

5.4 Strengths

This study held numerous strengths. Firstly, it is the first study to explore the BMAC in a six-session design with this population group. This is an essential initial step in researching a novel intervention according to the Medical Research Council (MRC) guidelines. The findings regarding acceptability and feasibility show preliminary evidence consistent with previous research (Knagg et al., 2022), reinforcing that the BMAC can be well-received across different population groups. It also utilised multiple validated measures (Ahmed & Ishtiaq, 2021). Notably, participants in the current sample reported that they enjoyed and benefitted from the intervention.

5.5 Challenges & Future research

The low recruitment rate over seven months (n=3) highlighted the challenges of conducting research with this population group. A reason for this may be that individuals with psychosis have low levels of trust in researchers due to the nature of the presentation, where individuals often experience paranoia (Woodall et al., 2010). Additionally, current staff pressures within the NHS could have affected recruitment, and the trainees residing far away from the place of recruitment made it challenging to build relationships with staff and receive referrals. Future feasibility studies could aim to overcome these barriers by exploring alternative recruitment strategies. Expanding recruitment outside the NHS and engaging with community organisations could help increase engagement. Additionally, using social media and online platforms to advertise the study could also be helpful.

Research has previously reported an improvement in well-being in one session of the BMAC in individuals with psychosis (Johnson et al., 2012; Mote & Kring, 2019), as well as an improvement in suicidal thoughts with administering the BMAC (Mitchell 2020; Durddridge, 2013; Knagg et al., 2022). It must be highlighted that when some participants began the intervention, their suicidal thoughts had already subsided. The lack of initial symptom severity, as well as the low sample size, limits the ability to assess the intervention's impact on reducing suicidal thoughts. Future research could consider altering the inclusion criteria to include individuals who have experienced suicidal thoughts more recently, for example, in the past four weeks rather than in the past 12 weeks, to guarantee that the target group is appropriately included.

As acknowledged, this study had limitations, and its results should be interpreted cautiously. The current study contained a small sample size without a control group and randomisation (Joy et al., 2005). To further determine acceptability and feasibility, a more extensive pilot study, rather than a clinical trial, is required to ascertain the actual effects of this intervention in individuals with psychosis and suicidal thoughts. Additionally, the small sample size means the results may not be generalisable to this population group or others.

It would have been unethical for participants not to be able to receive other treatments while participating in the BMAC. However, the impact of psychological therapies and medication on the current study is unknown, and it cannot be ruled out that this may have affected the current study results. Side effects of antipsychotics have been reported by participants, such as drowsiness, feeling tired, loss of motivation, emotional numbing, and

suicidality (Read & Williams, 2019). Future research should consider these factors as these side effects could interfere with the intervention.

It is essential to consider that the assessors knew about the intervention, which could lead to the risk of rater bias. This could have influenced the accuracy of outcomes and participants' acceptability and feasibility scores. Social desirability bias can occur when participants respond to questions to make them appear good to others (Latkin et al., 2017). Due to the trainee delivering the intervention and collecting the results, the participants could not have wanted negative feedback to affect the therapeutic relationship. Therefore, it is important to consider that this bias may have affected the results.

In the current study, qualitative feedback was not collected but could benefit future research. Collecting qualitative feedback specific to the Broad-Minded Affective Coping (BMAC) intervention is essential to refine its delivery and address barriers identified in this study. It would be helpful to know how the participants experienced the virtual sessions compared to the in-person administration of the BMAC and to explore the potential helpful adaptations advised for this population group. Similarly, clinicians could help talk about the barriers, for example, in the referral process and how this can be improved going forward. Qualitative feedback will help refine the BMAC sessions' structure and content. This would hopefully mean the BMAC is more accessible and feasible for participants in the future.

Conclusion

This study explored the acceptability and feasibility of the Broad-Minded Affective Coping (BMAC) intervention for individuals with psychosis and suicidal ideation. It was found that some participants reported good experiences with the BMAC. The current study's findings should be interpreted cautiously as the sample size was small and the study had limitations. Adaptations, such as using future positive scenarios and the 5-4-3-2-1 grounding technique, appeared to help engagement, but further exploration is required. The study faced challenges with recruitment, retention, and potential biases. Therefore, future research to improve on these areas has been recommended. These findings offer initial insights that could help shape the development of the BMAC intervention and inform the design of a larger pilot study.

6. References

. Ahn, C., & Jung, S.-H. (2004). Effect Of Dropouts On Sample Size Estimates For Test On Trends Across Repeated Measurements. *Journal of Biopharmaceutical Statistics*, *15*(1), 33–41. https://doi.org/10.1081/bip-200040809

Attkisson, C. Clifford., & Zwick, R. (1982). The client satisfaction questionnaire. *Evaluation and Program Planning*, *5*(3), 233–237. https://doi.org/10.1016/0149-7189(82)90074-x

Beard, C., Hsu, K. J., Rifkin, L. S., Busch, A. B., & Björgvinsson, T. (2016). Validation of the PHQ-9 in a psychiatric sample. *Journal of Affective Disorders*, *193*(193), 267–273. https://doi.org/10.1016/j.jad.2015.12.075

Beck, A., Steer, R., Kovacs, M., & Garrison, B. (n.d.). *Hopelessness and Eventual Suicide: A 10-Year Prospective Study of Patients Hospitalized With Suicidal Ideation*. https://citeseerx.ist.psu.edu/document?repid=rep1&type=pdf&doi=aa88c668ecdbb3160a268d79498f87dbe467dc51

Bornheimer, L. A., Zhang, A., Li, J., Hiller, M., & Tarrier, N. (2020). Effectiveness of Suicide-Focused Psychosocial Interventions in Psychosis: A Systematic Review and Meta-Analysis. *Psychiatric Services*, appi.ps.2019004. https://doi.org/10.1176/appi.ps.201900487

Calabrese, J., & Al Khalili, Y. (2019, October 27). *Psychosis*. Nih.gov; StatPearls Publishing. https://www.ncbi.nlm.nih.gov/books/NBK546579/

Carver, C. S., & Scheier, M. F. (2000, January 1). *Chapter 3 - On the Structure of Behavioral Self-Regulation* (M. Boekaerts, P. R. Pintrich, & M. Zeidner, Eds.). ScienceDirect; Academic Press. https://www.sciencedirect.com/science/article/abs/pii/B9780121098902500329

Chang, E. C., Jiang, X., Tian, W., Yi, S., Liu, J., Liang, P., Liang, Y., Lai, S., Shi, X., Li, M., Chang, O. D., & Hirsch, J. K. (2021). Hope as a Process in Understanding Positive Mood and Suicide Protection. *Crisis*, 1–8. https://doi.org/10.1027/0227-5910/a000755

Drake, R., Haddock, G., Tarrier, N., Bentall, R., & Lewis, S. (2007). The Psychotic Symptom Rating Scales (PSYRATS): Their usefulness and properties in first episode psychosis. *Schizophrenia Research*, *89*(1-3), 119–122. https://doi.org/10.1016/j.schres.2006.04.024

Estradé, A., Onwumere, J., Venables, J., Gilardi, L., Cabrera, A., Rico, J., Hoque, A., Otaiku, J., Hunter, N., Kéri, P., Kpodo, L., Sunkel, C., Bao, J., Shiers, D., Bonoldi, I., Kuipers, E., & Fusar-Poli, P. (2023). The Lived Experiences of Family Members and Carers of People with Psychosis: a Bottom-Up Review Co-Written by Experts by Experience and Academics. *Psychopathology*, *56*(5), 1–12. https://doi.org/10.1159/000528513

Fredrickson, B. L. (1998). What good are positive emotions? *Review of General Psychology*, *2*(3), 300–319. https://doi.org/10.1037/1089-2680.2.3.300

Fredrickson, B. L., & Kurtz, L. E. (2011). Cultivating positive emotions to enhance human flourishing. In S. I. Donaldson, M. Csikszentmihalyi, & J. Nakamura (Eds.), Applied positive psychology: Improving everyday life, health, schools, work, and society (pp. 35–47). Routledge/Taylor & Francis Group.

Gibson, J. (2019). Mindfulness, Interoception, and the Body: A Contemporary Perspective. *Frontiers in Psychology*, *10*. https://doi.org/10.3389/fpsyg.2019.02012

Goldiamond, I. (1975). Insider-outsider problems: A constructional approach. Rehabilitation Psychology, 22(2), 103–116. doi: 10.1037/h0090833 .

Gooding, P. A., Pratt, D., Awenat, Y., Drake, R., Elliott, R., Emsley, R., Huggett, C., Jones, S., Kapur, N., Lobban, F., Peters, S., & Haddock, G. (2020). A psychological intervention for suicide applied to non-affective psychosis: the CARMS (Cognitive AppRoaches to coMbatting Suicidality) randomised controlled trial protocol. *BMC Psychiatry*, *20*(1). https://doi.org/10.1186/s12888-020-02697-8

Haddock, G., Mccarron, J., Tarrier, N., & Faragher, E. B. (1999). Scales to measure dimensions of hallucinations and delusions: the psychotic symptom rating scales (PSYRATS). *Psychological Medicine*, *29*(4), 879–889. https://doi.org/10.1017/s0033291799008661

Haddock, G., Pratt, D., Gooding, P. A., Peters, S., Emsley, R., Evans, E., Kelly, J., Huggett, C., Munro, A., Harris, K., Davies, L., & Awenat, Y. (2019). Feasibility and acceptability of suicide prevention therapy on acute psychiatric wards: randomised controlled trial. *BJPsych Open*, *5*(1). https://doi.org/10.1192/bjo.2018.85

Hofstra, E., van Nieuwenhuizen, C., Bakker, M., Özgül, D., Elfeddali, I., de Jong, S. J., & van der Feltz-Cornelis, C. M. (2019). Effectiveness of suicide prevention interventions: A systematic review and meta-analysis. *General Hospital Psychiatry*, *63*. https://doi.org/10.1016/j.genhosppsych.2019.04.011

Holden, N., Kelly, J., Welford, M., & Taylor, P. J. (2016a). Emotional response to a therapeutic technique: The social Broad Minded Affective Coping. *Psychology and Psychotherapy: Theory, Research and Practice*, *90*(1), 55–69. https://doi.org/10.1111/papt.12095

Holden, N., Kelly, J., Welford, M., & Taylor, P. J. (2016b). Emotional response to a therapeutic technique: The social Broad Minded Affective Coping. *Psychology and Psychotherapy: Theory, Research and Practice*, *90*(1), 55–69. https://doi.org/10.1111/papt.12095

Holmes, E. A., Lang, T. J., & Deeprose, C. (2009). Mental Imagery and Emotion in Treatment across Disorders: Using the Example of Depression. *Cognitive Behaviour Therapy*, *38*(sup1), 21–28. https://doi.org/10.1080/16506070902980729

Howes, O. D., Whitehurst, T., Shatalina, E., Townsend, L., Onwordi, E. C., Mak, T. L. A., Arumuham, A., O'Brien, O., Lobo, M., Vano, L., Zahid, U., Butler, E., & Osugo, M. (2021). The clinical significance of duration of untreated psychosis: an umbrella review and random-effects meta-analysis. *World Psychiatry*, *20*(1), 75–95. https://doi.org/10.1002/wps.20822

Johnson, J., Gooding, P. A., Wood, A. M., Fair, K. L., & Tarrier, N. (2012). A Therapeutic Tool for Boosting Mood: The Broad-Minded Affective Coping Procedure (BMAC). *Cognitive Therapy and Research*, *37*(1), 61–70. https://doi.org/10.1007/s10608-012-9453-8

Joy, J. E., Penhoet, E. E., Petitti, D. B., & Cancer, I. of M. (US) and N. R. C. (US) C. on N. A. to E. D. and D. of B. (2005). Common Weaknesses in Study Designs. In *www.ncbi.nlm.nih.gov*. National Academies Press (US). https://www.ncbi.nlm.nih.gov/books/NBK22323/#:~:text=Failure%20to%20use%20a%20control

Kao, Y.-C., Liu, Y.-P., & Lu, C.-W. (2011). Beck Hopelessness Scale: Exploring its Dimensionality in Patients with Schizophrenia. *Psychiatric Quarterly*, *83*(2), 241–255. https://doi.org/10.1007/s11126-011-9196-9

Kelly, P. J., Kyngdon, F., Ingram, I., Deane, F. P., Baker, A. L., & Osborne, B. A. (2017). The Client Satisfaction Questionnaire-8: Psychometric properties in a cross-sectional survey of people attending residential substance abuse treatment. *Drug and Alcohol Review*, *37*(1), 79–86. https://doi.org/10.1111/dar.12522

Kliem, S., Lohmann, A., Mößle, T., & Brähler, E. (2018). Psychometric properties and measurement invariance of the Beck hopelessness scale (BHS): results from a German representative population sample. *BMC Psychiatry*, *18*(1). https://doi.org/10.1186/s12888-018-1646-6

Knagg, H., Pratt, D., Taylor, P. J., & Palmier-Claus, J. (2022). A positive mental imagery intervention for targeting suicidal ideation in university students: A pilot study. *Clinical Psychology & Psychotherapy*. https://doi.org/10.1002/cpp.2720

Kroenke, K., Spitzer, R. L., & Williams, J. B. W. (2001). The PHQ-9: Validity of a brief depression severity measure. *Journal of General Internal Medicine*, *16*(9), 606–613. https://doi.org/10.1046/j.1525-1497.2001.016009606.x

Larsen, D. L., Attkisson, C. Clifford., Hargreaves, W. A., & Nguyen, T. D. (1979). Assessment of client/patient satisfaction: Development of a general scale. *Evaluation and Program Planning*, *2*(3), 197–207. https://doi.org/10.1016/0149-7189(79)90094-6

Mao, Z., Tian, L., Sun, Y., Dong, F., Wang, C., & Bo, Q. (2023). Quality of life and its predictors in first-episode schizophrenia and individuals at clinical high-risk for psychosis. *BMC Psychiatry*, *23*(1). https://doi.org/10.1186/s12888-023-05303-9

Marshall, M., & Rathbone, J. (2011). Early intervention for psychosis. *Cochrane Database of Systematic Reviews*. https://doi.org/10.1002/14651858.cd004718.pub3

Miguel-Alvaro, A., M. Mar Gómez-Gutiérrez, Hornillos, C., M. José Hernández-Lloreda, & Crespo, M. (2023). Implementation and Effects of the Broad-Minded Affective Coping (BMAC) Technique: a Pilot Study. *International Journal of Cognitive Therapy*, *16*(2), 266–284. https://doi.org/10.1007/s41811-023-00163-3

Moreno-Küstner, B., Martín, C., & Pastor, L. (2018). Prevalence of psychotic disorders and its association with methodological issues. A systematic review and meta-analyses. *PLOS ONE*, *13*(4), e0195687. https://doi.org/10.1371/journal.pone.0195687

Mote, J., & Kring, A. M. (2019). Toward an Understanding of Incongruent Affect in People With Schizophrenia. *The Journal of Nervous and Mental Disease*, *207*(5), 393–399. https://doi.org/10.1097/nmd.0000000000000983

Olfson, M., Stroup, T. S., Huang, C., Wall, M. M., Crystal, S., & Gerhard, T. (2021). Suicide Risk in Medicare Patients With Schizophrenia Across the Life Span. *JAMA Psychiatry*, *78*(8). https://doi.org/10.1001/jamapsychiatry.2021.0841

Pallant, J. F. (2000). Development and Validation of a Scale to Measure Perceived Control of Internal States. *Journal of Personality Assessment*, *75*(2), 308–337. https://doi.org/10.1207/s15327752jpa7502_10

Panagioti, M., Gooding, P. A., & Tarrier, N. (2012). An empirical investigation of the effectiveness of the broad-minded affective coping procedure (BMAC) to boost mood among individuals with posttraumatic stress disorder (PTSD). *Behaviour Research and Therapy*, *50*(10), 589–595. https://doi.org/10.1016/j.brat.2012.06.005

Pearson, J., Naselaris, T., Holmes, E. A., & Kosslyn, S. M. (2015). Mental Imagery: Functional Mechanisms and Clinical Applications. *Trends in Cognitive Sciences*, *19*(10), 590–602. https://doi.org/10.1016/j.tics.2015.08.003

Peter James Taylor, Duxbury, P., Moorhouse, J., Russell, C., Pratt, D., Parker, S., Sutton, C., Lobban, F., Drake, R., Eccles, S., Ryder, D., Patel, R., Kimber, E., Kerry, E., Randles, N., Kelly, J., & Palmier-Claus, J. (2023). *The Mental Imagery for Suicidality in Students Trial (MISST): study protocol for a feasibility randomised controlled trial of broad-minded affective coping (BMAC) plus risk assessment and signposting versus risk assessment and signposting alone*. *9*(1). https://doi.org/10.1186/s40814-023-01273-7

Pinninti, N., Steer, R. A., Rissmiller, D. J., Nelson, S., & Beck, A. T. (2002). Use of the Beck Scale for Suicide Ideation with psychiatric inpatients diagnosed with schizophrenia, schizoaffective, or bipolar disorders. *Behaviour Research and Therapy*, *40*(9), 1071–1079. https://doi.org/10.1016/s0005-7967(02)00002-5

Pinninti, N., Steer, R. A., Rissmiller, D. J., Nelson, S., & Beck, A. T. (2002). Use of the Beck Scale for Suicide Ideation with psychiatric inpatients diagnosed with schizophrenia, schizoaffective, or bipolar disorders. *Behaviour Research and Therapy*, *40*(9), 1071–1079. https://doi.org/10.1016/s0005-7967(02)00002-5

Proctor, E., Silmere, H., Raghavan, R., Hovmand, P., Aarons, G., Bunger, A., Griffey, R., & Hensley, M. (2011). Outcomes for implementation research: Conceptual distinctions, measurement challenges, and research agenda. *Administration and Policy in Mental Health and Mental Health Services Research*, *38*(2), 65–76. https://doi.org/10.1007/s10488-010-0319-7

Read, J., & Williams, J. (2019). Positive and Negative Effects of Antipsychotic Medication: An International Online Survey of 832 Recipients. *Current Drug Safety*, *14*(3), 173–181. https://doi.org/10.2174/1574886314666190301152734

Shukla, A. (2020). A 5-Step Mindfulness Grounding Technique To Ease Anxiety & Why Mindfulness Works. *Cognition Today*.

Skodlar, B., Tomori, M., & Parnas, J. (2008). Subjective experience and suicidal ideation in schizophrenia. *Comprehensive Psychiatry*, *49*(5), 482–488. https://doi.org/10.1016/j.comppsych.2008.02.008

Spitzer, R., Kroenke, K., Williams, J., & Löwe, B. (2006, May 22). *A Brief Measure for Assessing Generalized Anxiety Disorder: The GAD-7*. Archives of Internal Medicine. https://pubmed.ncbi.nlm.nih.gov/16717171/

Symptoms, subtype, and suicidality in patients with schizophrenia spectrum disorders. (1997). *American Journal of Psychiatry*, *154*(2), 199–204. https://doi.org/10.1176/ajp.154.2.199

Tarrier, N. (2010). Broad minded affective coping (BMAC): A “Positive” CBT approach to facilitating positive emotions. *International Journal of Cognitive Therapy*, *3*(1), 64–76. https://doi.org/10.1521/ijct.2010.3.1.64

Tarrier, N., Kelly, J., Maqsood, S., Snelson, N., Maxwell, J., Law, H., ... & Gooding, P. (2014). The cognitive behavioural prevention of suicide in psychosis: a clinical trial. *Schizophrenia research*, *156*(2-3), 204-210. https://doi.org/10.1016/j.schres.2014.04.029

Tarrier, N., Gooding, P., Pratt, D., Kelly, J., Awenat, Y., & Maxwell, J. (2013). *Cognitive behavioural prevention of suicide in psychosis: a treatment manual*. Routledge.

Teismann, T., Brailovskaia, J., & Margraf, J. (2019). Positive mental health, positive affect and suicide ideation. *International Journal of Clinical and Health Psychology*, *19*(2), 165–169. https://doi.org/10.1016/j.ijchp.2019.02.003

VandenBos, G. R. (2007). *APA PsycNet*. Psycnet.apa.org. https://psycnet.apa.org/record/2006-11044-000

Villa, J., Ehret, B. C., & Depp, C. A. (2020). Systematic Review of the Inclusion of People With Psychosis in Suicide-Specific Clinical Trials. *Crisis*, *41*(3), 233–236. https://doi.org/10.1027/0227-5910/a000628

Weiner, B. J., Lewis, C. C., Stanick, C., Powell, B. J., Dorsey, C. N., Clary, A. S., Boynton, M. H., & Halko, H. (2017). Psychometric assessment of three newly developed implementation outcome measures. *Implementation Science*, *12*(1). https://doi.org/10.1186/s13012-017-0635-3

WHO. Suicide worldwide in 2019. Available on: https://www.who.int/publications-detail-redirect/9789240026643. Accessed Jan 2024.

Woodward, T. S., Jung, K., Hwang, H., Yin, J., Taylor, L., Menon, M., Peters, E., Kuipers, E., Waters, F., Lecomte, T., Sommer, I. E., Daalman, K., van Lutterveld, R., Hubl, D., Kindler, J., Homan, P., Badcock, J. C., Chhabra, S., Cella, M., & Keedy, S. (2014). Symptom Dimensions of the Psychotic Symptom Rating Scales in Psychosis: A Multisite Study. *Schizophrenia Bulletin*, *40*(Suppl_4), S265–S274. https://doi.org/10.1093/schbul/sbu014

Woodall, A., Morgan, C., Sloan, C., & Howard, L. (2010). Barriers to participation in mental health research: are there specific gender, ethnicity and age related barriers? *BMC Psychiatry*, *10*(1). https://doi.org/10.1186/1471-244x-10-103

Yates, K., Lång, U., Cederlöf, M., Boland, F., Taylor, P., Cannon, M., McNicholas, F., DeVylder, J., & Kelleher, I. (2019). Association of Psychotic Experiences With Subsequent Risk of Suicidal Ideation, Suicide Attempts, and Suicide Deaths. *JAMA Psychiatry*, *76*(2), 180. https://doi.org/10.1001/jamapsychiatry.2018.3514

Tables and Figures

Table 2-1

BMAC stages

The six stages of the BMAC strategy (Tarrier, 2010)

Stage	Definition
1. Preparation	Participants are guided through a relaxation exercise by the therapist to help facilitation of positive memories.
2. Guided Imagery	Participants are asked to "paint a picture in mind" of the positive memory. Therapist prompts recall of memory.
3. Engaging in the senses	Participants are guided to recall the memory through sensory input (sight, touch, smell, taste, and sound).
4. Re-experiencing the associated emotion	Therapist prompts participants to recall how they felt emotionally at the time.
5. Integration of the memory	Participants are prompted to ask themselves what it was about the experience was that caused them to feel positive?
6. Feedback and debriefing	The therapist then asked questions about the application of each stage, and if participants experienced any difficulties. Rehearsal out of sessions is encouraged.

Table 2-2
Demographic information of the participants was collected at baseline.

Characteristics	Subgroups	*n*
Gender	Female	3
Ethnicity	White/White British	2
	White and Black Caribbean	1
Living status	Living with others	2
	Living alone	1
Current treatments	Currently receiving therapy	1
	Currently prescribed antipsychotics	2
	Currently prescribed other medication for mental health	1
Past treatment	None	2
	Cognitive Behavioural Therapy (CBT)	1

Table 2-3
Individual scores and satisfaction levels from the CSQ-8 (Larson et al., 1979) at 6 and 12 weeks.

CSQ-8 Item 0-4	Participant 1 (6 weeks)	Participant 1 (12 weeks)	Participant 2 (6 weeks)	Participant 2 (12 weeks)
1. How would you rate the quality of service?	4	4	4	4
2. Did you get the kind of service you wanted?	3	4	4	3
3. To what extent has our program met your needs?	3	3	3	3
4. If a friend were in need, would you recommend?	4	4	4	4
5. How satisfied are you with the amount of help?	4	4	4	4

CSQ-8 Item 0-4	Participant 1 (6 weeks)	Participant 1 (12 weeks)	Participant 2 (6 weeks)	Participant 2 (12 weeks)
6. Have our services helped you to deal?	3	4	4	4
7. Overall, how satisfied are you?	4	4	4	4
8. If you were to seek help again, would you?	3	4	4	4
Total Score	28	31	31	30

Table 2-4

Individual scores from the AIM, IAM, FIM (Weiner et al., 2017) at 6 and 12 weeks from participants.

Measure	Item	Participant 1 (6 weeks)	Participant 1 (12 weeks)	Participant 2 (6 weeks)	Participant 2 (12 weeks)
AIM (1-5)	1.The BMAC intervention Meets my approval	5	5	4	5
	2. The BMAC intervention is appealing to me.	5	5	5	5
	3. I like this BMAC intervention	4	4	4	4
	4. I welcome this BMAC intervention	5	5	4	5
AIM total		19	19	17	19
IAM (1-5)	1.The BMAC intervention seems fitting	4	4	4	4

	2. The BMAC intervention seems suitable	4	4	4	4
	3. This BMAC intervention seems applicable	5	5	4	5
	4. This BMAC intervention seems like a good match	4	4	4	4
IAM total		17	17	16	17

FIM (1-5)	1.The BMAC intervention seems implementable.	5	5	5	5
	2. The BMAC intervention seems possible.	5	5	4	5
	3. The BMAC intervention seems doable.	5	5	4	5
	4. The BMAC intervention seems easy to use.	5	5	4	5
FIM total		20	20	17	20

Table 2-5

Summary statistics and outcome data for key variables BSS, BHS, GAD-7, PHQ-9, and PCOISS at baseline, six weeks post-intervention, and 12 weeks follow-up across three participants.

Variable	Baseline	Post (6 weeks)	Follow up (12 weeks)	Baseline to post difference	Baseline to Follow up difference
BSS (0-38)					
P1	25	20	18	-5	-7
P2	4	-	-	-	-
P3	0	0	0	0	0
BHS (0-20)					
P1	15	13	13	-2	-2
P2	9	-	-	-	-
P3	1	2	1	1	0
GAD-7 (0-21)					
P1	18	18	18	0	0
P2	6	-	-	-	-
P3	16	9	9	-7	-7
PHQ-9 (0-27)					-4
P1	24	20	20	-4	-
P2	8	-	-	-	-1
P3	4	10	3	+6	
PCOISS (32-160)					
P1	39	42	42	+3	+3
P2	33	-	-	-	-
P3	51	65	73	+14	+22

Figure 2-1

CONSORT Diagram to demonstrate the flow of participants at different times within the intervention.

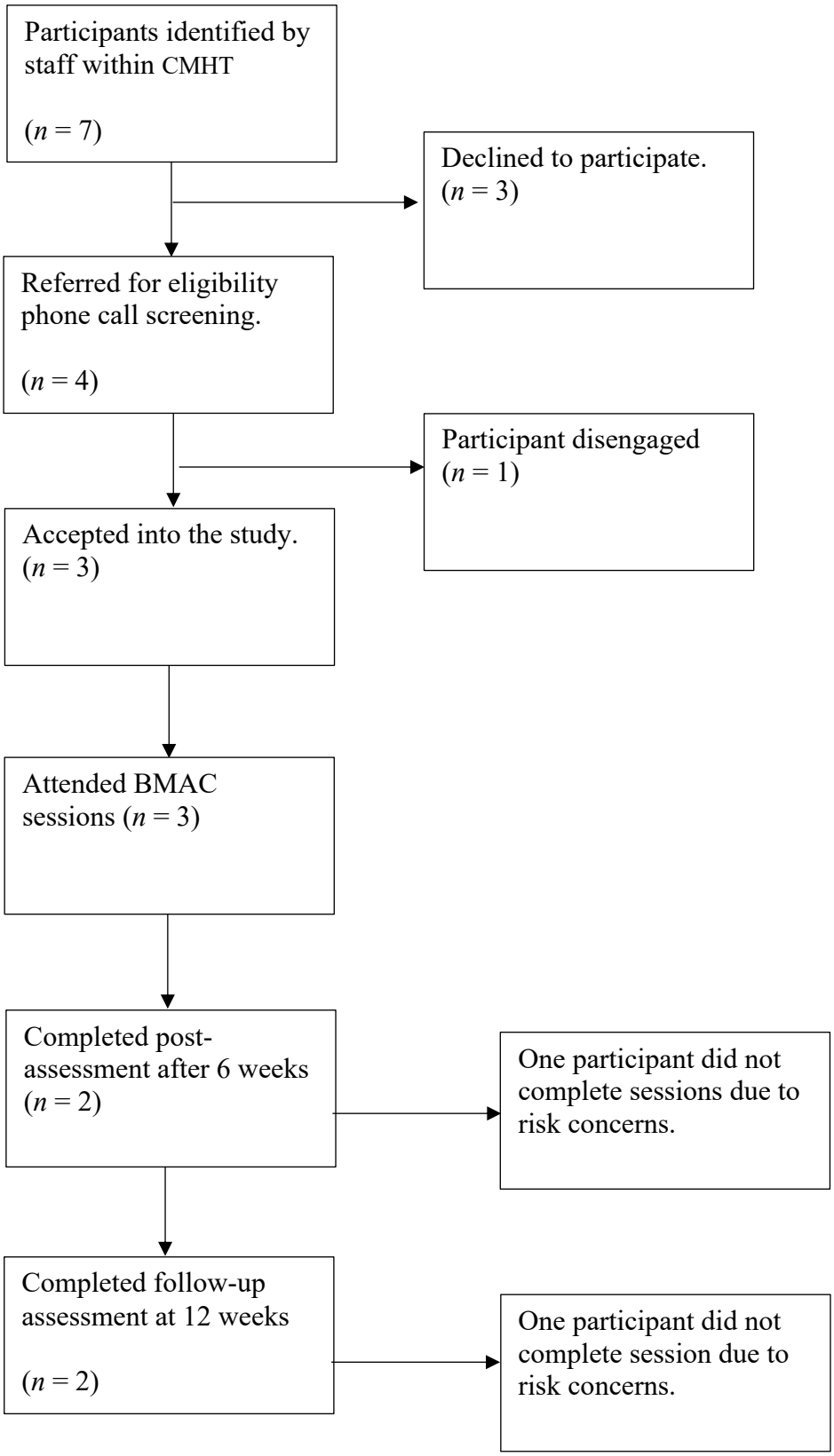
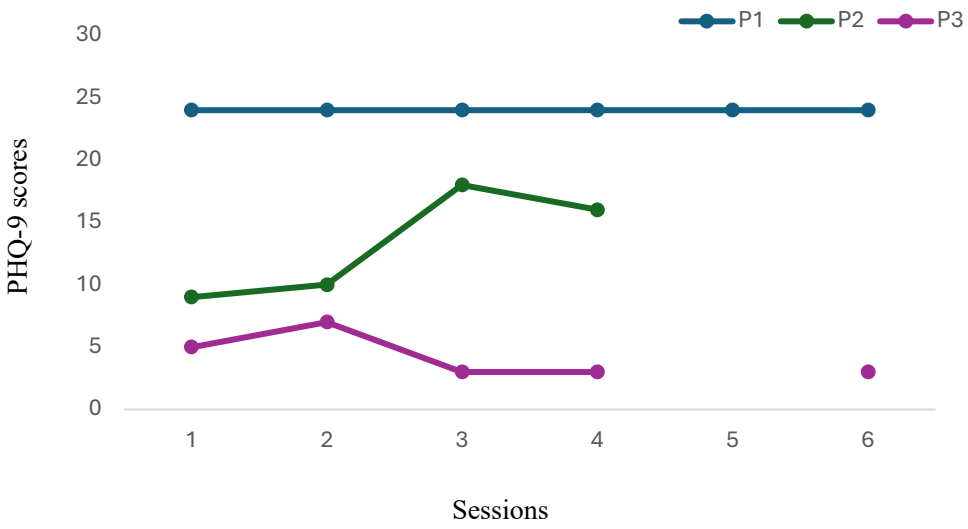


Figure 2-2 *Changes in PHQ-9 scores during intervention*



Note. Figure 2-2 illustrates the changes in PHQ-9 scores for three participants throughout the intervention. Participant One maintained a stable PHQ-9 score across the intervention, indicating no change in depressive symptoms. Participant Two had a sharp increase in PHQ-9 score and a decline after session 3. No further data were collected for Participant Two due to hospital admission. Participant Three experienced a consistent reduction in PHQ-9 scores, particularly after the third session.

Appendices

Appendix 2A

The Psychotic Symptom Rating Scales

Interview Schedule

Gillian Haddock Version 2009

AUDITORY HALLUCINATIONS

1. Frequency

Probing questions

How often have you heard your voices over the last week?
Thinking about the last week, what has it been like?'' e.g. every day, all day long etc."

Scoring criteria:

0 Voices not present or present less than once a week (specify frequency if present)

1 Voices occur for at least once a week

2 Voices occur at least once a day

3 Voices occur at least once an hour

4 Voices occur continuously or almost continuously i.e., stop for only a few seconds or minutes .

2. Duration

Probing questions

When you have heard your voices over the last week, how long have they lasted? Have they lasted for a few seconds, minutes, hours, all day long for example....?"

Scoring criteria:

0 Voices not present

1 Voices last for a few seconds, fleeting voices

2 Voices last for several minutes

3 Voices last for at least one hour

4 Voices last for hours at a time

3. Location

Probing questions

When you have heard your voices over the last week, where did they sound like they were happening?

Did they sound like they were inside your head and/or outside your head? Whereabouts do your voices sound like they are coming from?

Scoring criteria:

0 No voices present

1 Voices sound like they are inside head only

2 Voices outside the head, but close to ears or head. Voices inside the head may also be present.

3 Voices sound like they are inside or close to ears and outside head away from ears

4 Voices sound like they are from outside the head only

4. Loudness

Probing questions

How loud are your voices?

Are they louder than my voice, about the same loudness, quieter or just a whisper?

Scoring criteria:

0 Voices not present

1 Quieter than own voice, whispers.

2 About same loudness as own voice

3 Louder than own voice

4 Extremely loud, shouting

5. Beliefs regarding the origin of voices

Probing questions

What do you think has caused your voices?

Are the voices caused by factors related to you, or due to other people or factors? Are your voices caused by your mental health problems or illness?

How much do you believe that your voices are caused by (add interviewee's contribution) on a scale from 0-100 with 100 being that you are totally convinced, have no doubts and 0 being that it is completely untrue?

Scoring criteria:

0 Voices not present

1 Believes voices to be solely internally generated and related to self

2 Holds a less than 50% conviction that voices originate from external causes

3 Holds 50% or more conviction (but less than 100%) that voices originate from external causes

4 Believes voices are solely due to external causes (100% conviction)

6.Amount of negative content of voices

Probing questions

Do you think that your voices have said unpleasant things or negative things over the last week?

How much of the time do the voices say these types of unpleasant or negative items?

Scoring criteria:

0 No unpleasant content

1 Occasional unpleasant content

2 Minority of voice content is unpleasant or negative (less than 50%)

3 Majority of voice content is unpleasant or negative (50% or more)

4 All of voice content is unpleasant or negative

7. Degree of negative content

Probing questions

Can you tell me a bit about what you have heard your voices saying over the last week? Can you give me some examples of the things you have heard this week?

Scoring criteria:

0 Not unpleasant or negative

1 Some degree of negative content, but not personal comments relating to self or family e.g. swear words or comments not directed to self, e.g. “the milkman’s ugly”

2 Personal verbal abuse, comments on behaviour e.g. “shouldn’t do that or say that”

3 Personal verbal abuse relating to self-concept e.g. “you’re lazy, ugly, mad, perverted”

4 Personal threats to self e.g. threats to harm self or family, extreme instructions or commands to harm self or others and personal verbal abuse as in (3)

8. Amount of distress

Probing questions

Have you found your voices to be distressing over the last week?

How much of the time have they caused you distress over the last week?

Scoring criteria:

0 Voices not distressing at all

1 Voices occasionally distressing, majority not distressing (<10%)

2 Minority of voices distressing (<50%)

3 Majority of voices distressing, minority not distressing (≥ 50%)

4 Voices always distressing

9. Intensity of distress

Probing questions

Over the last week when your voices have been distressing, how distressing has that been? Thinking about the worst distress you could feel, over the last week, how have your voices compared to that? For example, has it been slightly, moderately distressing etc.?

Scoring criteria:

0 Voices not distressing at all

1 Voices slightly distressing

2 Voices are distressing to a moderate degree

3 Voices are very distressing, although interviewee could feel worse

4 Voices are extremely distressing, feel the worst he/she could possibly

10. Disruption to life caused by voices

Probing questions

How much disruption have the voices caused to your life over the last week?
Can you tell me how the voices stopped you from working or doing any other daytime activity that you wanted to do?
How much have they interfered with your relationships with friends and/or family?
How much have they prevented you from looking after yourself, e.g. bathing, changing clothes, etc.?

Scoring criteria:

0 No disruption to life, able to maintain social and family relationships (if present)

1 Voices cause minimal amount of disruption to life e.g. interferes with concentration although able to maintain daytime activity and social and family relationships and be able to maintain independent living without support.

2. Voices cause moderate amount of disruption to life causing some disturbance to daytime activity and/or family or social activities. The interviewee is not in hospital although may live in supported accommodation or receive additional help with daily living skills.

3 Voices cause severe disruption to life so that hospitalisation is usually necessary. The interviewee is able to maintain some daily activities, self-care and relationships whilst in hospital. The interviewee may also be in supported accommodation but experiencing severe disruption of life in terms of activities, daily living skills and/or relationships.

4 Voices cause complete disruption of daily life requiring hospitalisation. The interviewee is unable to maintain any daily activities and social relationships. Self-care is also severely disrupted.

11. Controllability of voices

Probing questions

What control had you had over your voices over the last week?
How much control have you had over your voices when they happened over the last week?
Can you get rid of, dismiss or bring on your voices?"

0 Interviewee believes they can have control over the voices and can always bring on or dismiss them at will

1 Interviewee believes they can have some control over the voices on the majority of occasions

2 Interviewee believes they can have some control over their voices approximately half of the time

3 Interviewee believes they can have some control over their voices but only occasionally. The majority of the time the interviewee experiences voices which are uncontrollable

4 Interviewee has no control over when the voices occur and cannot dismiss or bring them on at all.

Scoring criteria

DELUSIONAL BELIEFS

1. Amount of preoccupation with delusions

Probing questions

Over the last week, how much time have you spent thinking about your beliefs about ..... [insert client's beliefs]?

Scoring criteria:

0 No delusions, or delusions which the interviewee thinks about less than once a week.

1 Interviewee thinks about beliefs at least once a week.

2 Interviewee thinks about beliefs at least once a day.

3 Interviewee thinks about beliefs at least once an hour.

4. Interviewee thinks about delusions continuously or almost continuously.

2. Duration of preoccupation with delusions

Probing questions

When you have thought about any of your beliefs (i.e. [insert interviewee's beliefs] ...) over the last week, how long do they tend to stay in your mind? - Few seconds/minutes/hours, etc.?

Scoring criteria:

0 No delusions

1 Thoughts about beliefs last for a few seconds, fleeting thoughts

2 Thoughts about delusions last for several minutes

3 Thoughts about delusions last for at least one hour

4 Thoughts about delusions usually last for hours at a time

3. Conviction

Probing questions

At the moment, do you have any doubts about any of your beliefs, for example do you sometimes wonder whether they are real or not? (Go through each belief in turn).

How much do you believe in...[insert belief/beliefs]? Can you estimate this on a scale from 0 – 100, where 100 means that you are totally convinced by your beliefs and 0 being that you are not convinced at all?

Scoring criteria:

0 No conviction at all

1 Very little conviction in reality of beliefs, less than 10%

2 Some doubts relating to conviction in beliefs, between 10-49%

3 Conviction in belief is very strong, between 50 – 99%

4 Conviction is 100%

4. Amount of Distress

Probing questions

Have your beliefs about [insert interviewee's beliefs] caused you distress over the last week? How much of the time have they caused you distress over the last week?

Scoring criteria:

0 Beliefs never cause distress

1 Beliefs cause distress on the minority of occasions.

2 Beliefs cause distress on less than 50 % of occasions

3 Beliefs cause distress on the majority of occasions when they occur between 51-99% of time

4 Beliefs always cause distress when they occur

5. Intensity of Distress

Probing questions

Over the last week, when you have felt distressed by your beliefs about [insert interviewee's beliefs] how severe does this feel?" Have you felt slightly, distressed, moderately distressed etc..

Scoring criteria:

0 No distress

1 Beliefs cause slight distress

2 Beliefs cause moderate distress

3 Beliefs cause marked distress

4 Beliefs cause extreme distress, couldn't be worse

6. Disruption to life caused by beliefs

Probing questions

In what way have your beliefs caused disruption for you over the last week?
In what way have they stopped you working or carrying out a day-time activity?
In what way have they interfered with your relationships with family or friends?
In what way have they interfered with your ability to look after yourself, e.g. washing, changing clothes, etc.?

Scoring criteria:

0 No disruption to life, able to maintain independent living with no problems in daily living skills. Able to maintain social and family relationships (if present)

1 Beliefs cause minimal amount of disruption to life, e.g. interferes with concentration although able to maintain daytime activity and social and family relationships and be able to maintain independent living without support.

2 Beliefs cause moderate amount of disruption to life causing some disturbance to daytime activity and/or family or social activities. The interviewee is not in hospital although may live in supported accommodation or receive additional help with daily living skills.

3 Beliefs cause severe disruption to life so that hospitalisation is usually necessary. The interviewee is able to maintain some daily activities, self-care and relationships whilst in hospital. The interviewee may also be in supported accommodation but experiencing severe disruption of life in terms of activities, daily living skills and/or relationships.

4 Beliefs cause complete disruption of daily life requiring hospitalisation. The interviewee is unable to maintain any daily activities and social relationships. Self-care is also severely disrupted.

AUDITORY HALLUCINATIONS RATING SCALE SCORE SHEET

Briefly describe experiences for rating:

1. FREQUENCY.....
2. DURATION.....
3. LOCATION.....
4. LOUDNESS.....
5. BELIEFS RE-ORIGIN OF VOICES.....
6. AMOUNT OF NEGATIVE CONTENT OF VOICES.....
7. DEGREE OF NEGATIVE CONTENT.....
8. AMOUNT OF DISTRESS.....
9. INTENSITY OF DISTRESS.....
10. DISRUPTION.....
11. CONTROL.....

TOTAL AUDITORY HALLUCINATIONS SCORE

…….

DELUSIONS RATING SCALE SCORE SHEET

Briefly describe experiences for rating:

1. AMOUNT OF PREOCCUPATION.....
2. DURATION OF PREOCCUPATION.....
3. CONVICTION.....
4. AMOUNT OF DISTRESS.....
5. INTENSITY OF DISTRESS.....
6. DISRUPTION.....

TOTAL DELUSIONS SCORE

……

Appendix 2B
CSQ-8 questionnaire

Client Satisfaction Questionnaire (CSQ-8, v. TMS-180S)
(Larsen et al., 1979)

Instructions for participants:
Please help us improve our service by answering some questions about the help that you have received. We are interested in your honest opinions, whether they are positive or negative. Please answer all of the questions. We also welcome your comments and suggestions. Thank you very much. We appreciate your help.

1. How would you rate the quality of service you received?
   - ○ Excellent (4)
   - ○ Good (3)
   - ○ Fair (2)
   - ○ Poor (1)

2. Did you get the kind of service you wanted?
   - ○ No, definitely not (1)
   - ○ No, not really (2)
   - ○ Yes, generally (3)
   - ○ Yes, definitely (4)

3. To what extent has our service met your needs?
   - ○ Almost all of my needs have been met (4)
   - ○ Most of my needs have been met (3)
   - ○ Only a few of my needs have been met (2)
   - ○ None of my needs have been met (1)

4. If a friend were in need of similar help, would you recommend our service to him or her?
   - ○ No, definitely not (1)
   - ○ No, I don't think so (2)
   - ○ Yes, I think so (3)
   - ○ Yes, definitely (4)

5. How satisfied are you with the amount of help you received?
   - ○ Quite dissatisfied (1)
   - ○ Indifferent or mildly dissatisfied (2)
   - ○ Mostly satisfied (3)
   - ○ Very satisfied (4)

6. Have the services you received helped you to deal more effectively with your problems?
   - ○ Yes, they helped a great deal (4)
   - ○ Yes, they helped somewhat (3)
   - ○ No, they really didn't help (2)

- ○ No, they seemed to make things worse (1)

7. In an overall, general sense, how satisfied are you with the service you received?
   - ○ Very satisfied (4)
   - ○ Mostly satisfied (3)
   - ○ Indifferent of mildly dissatisfied (2)
   - ○ Quite dissatisfied (1)

8. If you were to seek help again, would you come back to our service?
   - ○ No, definitely not (1)
   - ○ No, I don't think so (2)
   - ○ Yes, I think so (3)
   - ○ Yes, definitely (4)

Scoring:

Scores are summed across items once. Items 2, 4, 5, and 8 are reverse scored. Total scores range from 8 to 32, with the higher number indicating greater satisfaction.

Citation:

Larsen DL, Attkisson CC, Hargreaves WA, Nguyen TD. Assessment of client/patient satisfaction: development of a general scale. Evaluation and Program Planning. 1979;2(3):197-207. PMID: 10245370 DOI: 10.1016/0149-7189(79)90094-6.

Appendix 2C

AIM, IAM & FIM questionnaires

Final version of the Acceptability of Intervention Measure (AIM), Intervention Appropriateness Measure (IAM), and Feasibility of Intervention Measure (FIM)

GENERAL INSTRUCTIONS: These measures could be used independently or together. The IAM items could be modified to specify a referent organization, situation, or population (e.g., my clients). Please check and report the psychometric properties with each use or modification.

Acceptability of Intervention Measure (AIM)

	Completely disagree	Disagree	Neither agree nor disagree	Agree	Completely agree
1. (INSERT INTERVENTION) meets my approval.	①	②	③	④	⑤
2. (INSERT INTERVENTION) is appealing to me.	①	②	③	④	⑤
3. I like (INSERT INTERVENTION).	①	②	③	④	⑤
4. I welcome (INSERT INTERVENTION).	①	②	③	④	⑤

Intervention Appropriateness Measure (IAM)

	Completely disagree	Disagree	Neither agree nor disagree	Agree	Completely agree
1. (INSERT INTERVENTION) seems fitting.	①	②	③	④	⑤
2. (INSERT INTERVENTION) seems suitable.	①	②	③	④	⑤
3. (INSERT INTERVENTION) seems applicable.	①	②	③	④	⑤
4. (INSERT INTERVENTION) seems like a good match.	①	②	③	④	⑤

Feasibility of Intervention Measure (FIM)

	Completely disagree	Disagree	Neither agree nor disagree	Agree	Completely agree
1. (INSERT INTERVENTION) seems implementable.	①	②	③	④	⑤
2. (INSERT INTERVENTION) seems possible.	①	②	③	④	⑤
3. (INSERT INTERVENTION) seems doable.	①	②	③	④	⑤
4. (INSERT INTERVENTION) seems easy to use.	①	②	③	④	⑤

Pragmatic Qualities:

- Readability tested by substituting "This EBP" for "Insert Intervention." Flesch reading ease score (and grade level) is 95.15 (5th grade) for AIM, 99.60 (5th grade) for IAM, and 94.17 (5th grade) for FIM.
- No specialized training is needed to administer, score, or interpret the measures.
- Cut-off scores for interpretation not yet available; however, higher scores indicate greater acceptability, appropriateness, or feasibility.
- Norms not yet available.
- Scales can be created for each measure by averaging responses. Scale values range from 1 to 5. No items need to be reverse coded. Good measurement practice: assess structural validity to confirm the unidimensionality of each measure and calculate alpha coefficient to ascertain reliability.
- There is no cost to use these measures.
- Time to complete: less than 5 minutes per measure.

Appendix 2D
The Perceived Control of Internal States Scale

Instructions: Using the scale provided, decide how much you either disagree or agree with each of the following statements. Circle the number from 1 to 5 that best indicates how you feel.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1. I don't have much control over my emotional reactions to stressful situations.	5	4	3	2	1
2. When I'm in a bad mood I find it hard to snap myself out of it.	5	4	3	2	1
3. My feelings are usually fairly stable.	1	2	3	4	5
4. I can usually talk myself out of feeling bad.	1	2	3	4	5
5. No matter what happens to me in my life I am confident of my ability to cope emotionally.	1	2	3	4	5
6. I have a number of good techniques that will help me cope with any stressful situation.	1	2	3	4	5
7. I find it hard to stop myself from thinking about my problems.	5	4	3	2	1

8. If I start to worry about something I can usually distract myself and think about something nicer.	1	2	3	4	5
9. If I realise I am thinking silly thoughts I can usually stop myself.	1	2	3	4	5
10. I am usually able to keep my thoughts under control.	1	2	3	4	5
11. I imagine there will be many situations in the future where silly thoughts will get the better of me.	5	4	3	2	1
12. I have a number of techniques which I am confident will help me think clearly and rationally in any situation I might find myself.	1	2	3	4	5
13. Even when under pressure I can usually keep calm and relaxed	1	2	3	4	5
14. I have a number of techniques or tricks that I use to stay relaxed in stressful situations.	1	2	3	4	5
15. When I'm anxious or uptight there does not seem to be much that I	5	4	3	2	1

can do to help myself relax.					
16. There is not much I can do to relax when I get uptight.	5	4	3	2	1
17. I have a number of ways of relaxing that I am confident will help me cope.	1	2	3	4	5
18. If my stress levels get too high I know there are things I can do to help myself.	1	2	3	4	5

Appendix 2E
GAD-7

GAD-7

Over the last 2 weeks, how often have you been bothered by the following problems? *(Use "✓" to indicate your answer"*	Not at all	Several days	More than half the days	Nearly every day
1. Feeling nervous, anxious or on edge	0	1	2	3
2. Not being able to stop or control worrying	0	1	2	3
3. Worrying too much about different things	0	1	2	3
4. Trouble relaxing	0	1	2	3
5. Being so restless that it is hard to sit still	0	1	2	3
6. Becoming easily annoyed or irritable	0	1	2	3
7. Feeling afraid as if something awful might happen	0	1	2	3

Appendix 2F
PHQ-9

Over the last 2 weeks, how often have you been bothered by any of the following problems (tick the relevant box for each question)?

	Not at all	Several days	More than half the days	Nearly every day
1. Little interest or pleasure in doing things?				
2. Feeling down, depressed, or hopeless?				
3. Trouble falling/staying asleep, sleeping too much?				
4. Feeling tired or having little energy?				
5. Poor appetite or overeating?				
6. Feeling bad about yourself or that you are a failure or have let yourself or your family down?				
7. Trouble concentrating on things, such as reading the newspaper or watching television?				
8. Moving or speaking so slowly that other people could				

have noticed? Or the opposite - being so fidgety or restless that you have been moving around a lot more than usual?				
9. Thoughts that you would be better off dead, or of hurting yourself in some way?				

Appendix 2G
Promotional poster

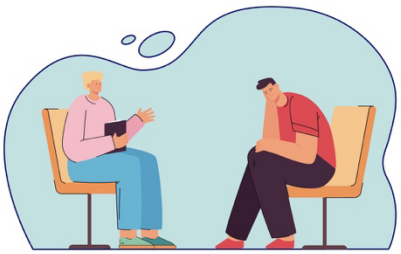
Lancaster University

My name is Claudia Daley, and I am a student on the doctorate of Clinical Psychology programme at Lancaster University. In collaboration with Lancaster University, I would like to invite you to take part in a positive mental intervention for targeting suicidal ideation in psychosis.Lancaster University is sponsor for the study.

RESEARCH PARTICIPANTS NEEDED

DO YOU EXPERIENCE PSYCHOSIS?

HAVE YOU EXPERIENCED SUICIDAL IDEATION AND/OR BEHAVIOURS IN THE PAST THREE MONTHS?



WHO IS ELIGIBLE?

- Aged 18 and over
- Suicidal ideation or behaviours in the past 3 months
- Currently under the care of CMHT/integrated care hub or early intervention for psychosis or have a diagnosis of a non-affective psychotic disorder (e.g. schizophrenia, schizoaffective disorder, delusional disorder, schizophreniform disorder)

DESCRIPTION OF THE STUDY.

You are invited to take part in a research study about a brief psychological therapy for individuals with psychosis who have experienced suicidal thoughts. The therapy is called the Broad-Minded Affective Coping (BMAC) intervention. It involves using mental imagery of past positive experiences to help strengthen positive emotions. We want to conduct a study of this therapy to tell us if it will be helpful in reducing suicidal thoughts. It will include 6 therapy sessions over 6 weeks and a follow-up session at 12 weeks.

BENEFITS

We will reimburse you a £10 voucher for assessment at 6 weeks and another £10 voucher for assessment at 12 weeks (follow-up) as compensation for taking part.

INTERESTED?

If you are interested in participating, please email Claudia Daley: C.DALEY@LANCASTER.AC.UK

POSTER; V2 03/07/2023; IRAS ID 316706

Appendix 2H

Participant Information Sheet

Exploring the use of a positive mental imagery intervention for targeting suicidal ideation in psychosis.

Participant Information Sheet (PIS) for individuals with psychosis

You are invited to participate in a research study about a brief psychological therapy for individuals with psychosis who have experienced suicidal thoughts. Before you decide whether to take part, it is important for you to understand why the research is being conducted and what it will involve. Please take time to read the following information carefully before deciding whether to take part. Discuss it with others if you wish. Please ask if anything is unclear or if you would like more information. Thank you for taking the time to read this information sheet.

About the research

- Who will conduct the research?

This study is being carried out by a team of researchers from Lancaster University. The project leads are trainee clinical psychologist Claudia Daley (Lancaster University), Dr Jasper Palmier-Claus (Lancaster University) and Prof. Bill Sellwood (Lancaster University). The study is sponsored by Lancaster University.

- What is the purpose of the research?

The study is designed to test a brief talking therapy for individuals with psychosis who experience suicidal thoughts. The therapy is called the Broad-Minded Affective Coping (BMAC) intervention. It involves using mental imagery of past positive experiences to help strengthen positive emotions.

We want to conduct a study of this therapy to tell us if it will be helpful in reducing suicidal thoughts. However, before we can conduct a clinical trial, we have to answer important questions about the acceptability (how do individuals with psychosis feel about the therapy?) and feasibility (is it possible to study this new therapy using a clinical trial?). The aim of this study is to answer these questions about how acceptable this therapy is and how

feasible it will be to conduct a larger trial in the future. We can answer these questions by running a smaller-scale pilot study of this therapy and collecting information about how individuals find the approach. We are planning to recruit 5-10 individuals to take part in this study.

- Why have I been chosen?

You have either been identified by your current clinical team as someone who may meet the research study criteria. You may also have referred yourself into the study. To take part you need to be:

- Aged 18 years or older.
- Currently accessing CMHT/integrated care hub or an early intervention service at the point of referral or have a diagnosis of a non-affective psychotic disorder (e.g. schizophrenia, schizoaffective disorder, delusional disorder or schizophreniform disorder).
- Have experienced suicidal thoughts (e.g. thoughts about ending your own life) in the past three months or have attempted to end your life in the past three months.
- Have a good understanding of the English language.

You will not be able to take part in the study if you have a bipolar disorder, organic psychosis, a known diagnosis of autism, a learning disability, or a brain injury or condition that affects your language ability. You will also not be able to take part if you have immediate plans to harm yourself or others. In such instances, we would encourage you to seek immediate help and support (e.g. attend A&E, call 999).

If you are interested in taking part, then we would first contact you by phone or video call to check that you are eligible to participate. We would tell you more about the study and answer any questions that you might have. We may also need to speak to your clinical team or counselling service before the study starts to check that you are eligible. If you are happy to take part, we would then arrange for a time to meet either face-to-face or via phone/video call to start the study.

- Will the outcomes of the research be published?

The research study will be written up for publication in academic journals. The research may also be discussed in conference presentations. You will not be identified in any reports, publications, or presentations.

- Who has reviewed the research project?

This study has been reviewed by Senior Research Facilitator – Farah Lunt at Lancashire & South Cumbria NHS Foundation Trust and Northwest Preston Ethics Committee. REC reference: 23/NW/0151

- What would I be asked to do if I took part?

If you are eligible and interested in taking part in the study, then we would invite you to an initial meeting with a researcher. Meetings for this study would either be in-person or can take place remotely by telephone or video call (e.g., MS Teams or attend anywhere). In-person meetings would take place in a confidential room at a place of mutual convenience (e.g., Early Intervention service, CMHT or GP surgery). At this first meeting, we would explain the study to you again and answer any questions that you have. We would then ask you to provide consent to take part. If it is an in-person meeting, then you would provide consent by filling in a consent form. If the meeting is taking place remotely, consent will be taken verbally by asking you questions about taking part and recording your response.

Once you have consented to take part, the researcher will ask you to complete a number of questionnaires and interviews. These will ask about your thoughts and feelings, including suicidal thoughts. For example, one question asks if the statement "I have a moderate to strong wish to die" describes your current thoughts. You are welcome to not answer any questions, take a break, or finish your involvement at any time. You are welcome to complete the assessments over multiple appointments if easier. This first meeting will last up to 75 minutes.

- You will also receive the brief positive mental imagery intervention. This will consist of six weekly sessions over 6 weeks with a clinician lasting about 50-60 minutes each. The therapist will introduce you to the positive mental imagery technique, which involves talking through positive memories and thoughts. They will offer guidance and support on how to use this technique in your everyday life. They

will also ask you to practice this technique between sessions. In the six weeks following the end of therapy, we will invite you to complete a follow-up assessment. With your permission (optional), we will record the sessions so that we can monitor and offer feedback on the therapy.

- The follow-up assessment will last around 60-75 minutes and involve completing a series of questionnaires about your thoughts, feelings, and difficulties. Like the initial meeting, these can take place face-to-face or via telephone/video calls. During the course of the study, a researcher may contact you by phone to check how the study is going, remind you of appointments, and to give you an opportunity to ask any further questions.

Throughout the study, you can decline to answer any questions or withdraw from the research at any time without detriment to yourself or it is affecting the standard of care that you receive. It will be possible to take breaks during sessions. This intervention (the BMAC) will not continue beyond the 12 weeks of the study and cannot be provided by your regular clinical team.

- Where will the research be conducted?

Meetings for this study, including both clinical and assessment meetings, will either be in-person or remotely over the telephone or a video call (e.g., Microsoft Teams). In-person meetings will take place at a place of mutual convenience (e.g., confidential room in GP surgery or Early Intervention service/CMHT/Integrated care hub). For remote meetings, the clinician or researcher would conduct these from a secure and confidential space. We will also check that you are able to access a private space for these remote meetings as well.

- What is the duration of the research?

The study will last approximately 12 weeks in total. Therapy sessions will take place over 6 weeks in total. There will be a follow-up session at 12 weeks.

- What are the benefits of taking part?

There are no direct benefits to you. We are still researching this new type of therapy and we do not yet know how effective it is for reducing suicidal thoughts. By taking part, you would be helping to improve and develop a new psychological therapy for individuals with

psychosis, which could help other people in the future. Past participants in this kind of research have sometimes found talking with a researcher about their difficulties to be a positive experience.

- Will I be compensated for taking part?

We will reimburse you a £10 voucher for assessment at 6 weeks and another £10 voucher for assessment at 12 weeks (follow-up) as compensation for taking part.

- What are the possible disadvantages of taking part?

The study would involve answering questions about things that could be upsetting. For example, we would likely ask you questions about any suicidal thoughts and difficult emotions. You are welcome to skip any questions that you find distressing or uncomfortable or end your participation at any time. During the assessment and signposting session, we will provide information and make suggestions on where you could access additional advice or support. You are also welcome to continue to access support from services and charities alongside the pilot study. This includes the Samaritans (116 123), Mind (0300 123 3393) and PAPYRUS (0800 068 4141). If you are struggling or experiencing distress during the study, we would also advise you to talk with your clinical team.

- What happens if I do not want to take part or if I change my mind?

You are free to withdraw from the study at any time even if you have provided consent to take part, without detriment to yourself. You do not need to give a reason for withdrawing or choosing to not take part in the study. Withdrawing from the study or choosing to not take part in the study would not affect any other support that you are receiving from NHS or other clinical services. To withdraw from the study or if you plan to not take part in the study, please inform a member of the research team. If you agree to have the session's audio recorded, you are free to ask us to stop recording at any time.

Data Protection and Confidentiality

How will we use information about you?

We will need to use information from you for this research project. This information will include your initials, NHS number (if known), name and contact details. We will keep all

information about you safe and secure. Once we have finished the study, we will keep some of the data so we can check the results. We will write our reports in a way that no-one can work out that you took part in the study.

Will my data be stored securely?

In accordance with data protection law, Lancaster University is the Data Controller for this project. This means that we are responsible for making sure that your personal information is kept secure, confidential, and used only in the way you have been told it will be used. All researchers are trained with this in mind, and your data will be kept securely and safely at Lancaster University. Data may be stored as an anonymous electronic file for the purposes of analysis. This anonymous study data will be stored for 10 years.

What are my rights in relation to the information you will collect about me?

Under the GDPR you have certain rights when personal data is collected about you. You have the right to access any personal data held about you, to object to the processing of your personal information, to rectify personal data if it is inaccurate, the right to have data about you erased and, depending on the circumstances, the right to data portability. Please be aware that many of these rights are not absolute and only apply in certain circumstances. In this study, we won't be able to let you see or change the data we hold about you as your data will be made anonymous so we will not be able to identify your specific data. This does not affect your data protection rights. If you wish to have your data destroyed, you will need to inform the team within one week of either withdrawing from or completing the study. If you would like to know more about your rights in relation to your personal data, please speak to the researcher on your particular study.

For further information about how Lancaster University processes personal data for research purposes and your data rights, please visit our webpage: www.lancaster.ac.uk/research/data-protection.

Will my information be communicated to anyone else?

We will not pass on information onto any other person without your permission. The only exception to this is if we are concerned that there is a risk of harm to you or another person. In these cases, it may be necessary to talk to another health professional, such as a GP,

therapist, or emergency services. If this happens, we would normally discuss this with you first before anything else happens. We will inform your GP or clinical team of your participation in the study.

Will I be able to know the results of the study?

If you wish, we can share the results of the study with you once it is completed. Please let us know if you would like a copy of the results.

What arrangements will be made for insurance and/or indemnity to meet the potential legal liability?

Lancaster University legal liability cover will apply If any harm is caused to participants.

To take part in the study, you must have the capacity to make informed decisions. If at any point during the study clinical services or we feel that you no longer have capacity, we would retain any existing study information but would request no further information from you.

Please also note that individuals from Lancaster University, LSCFT Foundation Trust, or regulatory authorities may need to look at the data collected for this study to make sure that we are carrying out the project as planned or to check for any problems. This may involve looking at identifiable data, but all individuals involved in auditing and monitoring the study will have a strict duty of confidentiality to you as a research participant

Anonymous data from this study may be used for other projects related to this topic (e.g., suicide prevention) by the research team and shared with other research groups working in this area. This is common practice in research and ensures that we can make the most of the time that you gave to the study. This information will not identify you or be combined with other information in a way that could identify you. The information will only be used for the purpose of health and care research and cannot be used to contact you regarding any other matter. It will not be used to make decisions about future services available to you.

Where can I obtain further information about this study if I need it?

If you have any questions about the study, or if you are interested in taking part, then please contact the researcher(s):

Researchers: Claudia Daley, Dr Jasper Palmier-Claus & Prof. Bill Sellwood

Email address: c.daley@lancaster.ac.uk

Study phone number: Claudia Daley – XXXXXXX

Please note you will not be able to call/email researchers if you need any help outside of clinical sessions. This phone/emails will not always be turned on and checked (only on clinic days). We are not able to respond to calls/emails on an urgent basis. If you require a more

urgent response, please contact your GP in the first instance. If you or someone you know are at imminent risk of harm, please contact LSCFT urgent mental health support line on 0800 953 0110 (free phone, available 24/7) or attend your local A+E department.

What if I have a complaint?

If you wish to make a complaint or raise concerns about any aspect of this study you can contact:

Dr Jasper Palmier Claus

Research Supervisor and Co-Investigator

J.Palmier-Claus@lancaster.ac.uk

If you wish to speak to someone from outside of this research project, you can contact:

Dr Ian Smith

Program Research Director

Doctorate in Clinical Psychology

Email: I.Smith@lancaster.ac.uk

Division of Health Research

Lancaster University

Lancaster

LA1 4YG

If you wish to speak to someone outside of the Doctorate in Clinical Psychology, you can contact:

Dr Laura Machin

Chair-Faculty of Health and Medicine Ethics Committee

Faculty of Health and Medicine

Lancaster University

Lancaster

LA1 4YG

Tel: 01524 594973

Email: l.machin@lancaster.ac.uk

Please note that complaints may only be picked up during working hours.

You also have a right to complain to the Information Commissioner's Office about complaints relating to your personal identifiable information (http://ico.org.uk/concerns). Tel 0303 123 1113

You can find out more about involvement in research at https://www.hra.nhs.uk/information-about-patients/

Additional information around data protection and GDPR can be found here https://www.lscft.nhs.uk/privacy

Appendix 2I
Consent form

IRAS ID: 316706

Centre Number:

Study Number:

Participant Identification Number for pilot study:

Exploring the use of a positive mental imagery intervention for targeting suicidal ideation in psychosis.

CONSENT FORM

If you are happy to participate, please complete and sign the consent form below

	Activities	Please initial box
1	I confirm that I have read the attached information sheet (Version 1 15/01/2023) for the above study and have had the opportunity to consider the information and ask questions and had these answered satisfactorily.	
2	I understand that my participation in the study is voluntary and that I am free to withdraw at any time without giving any reason, without my medical care or legal rights being affected.	
3	I agree to my clinical team (for example, Counselling Service, CMHT/integrated care hub or Early Intervention Service) and GP being informed of my participation in this study.	
4	I agree to a letter or letters summarising any risk information being sent to my nominated clinical team (for example, Counselling Service, CMHT/integrated care hub or Early Intervention Service) and GP.	
5	I agree to a summary of meetings with researchers and clinicians as part of the study being recorded in my medical notes.	
5	I understand that relevant sections of my medical notes and data collected during the study may be looked at by individuals from Lancaster University and regulatory authorities or from Lancashire and South Cumbria NHS Foundation Trust, where it is relevant to me taking part in this research. I give permission for these individuals to have access to my data.	

Appendix 2J
Demographic information

Exploring the use of a positive mental imagery intervention for targeting suicidal ideation in psychosis.

Demographic questionnaire

About you

What is your age (in years):

Gender – Please tick the option below that best describes you

□ Female

□ Male

□ Non-binary

□ Genderfluid

□ Female to male transgender

□ Male to female transgender

□ Other - please describe:

□ Prefer not to say

Sexuality – Please tick the option below that best describes you

□ Heterosexual

□ Gay/ Lesbian

□ Bisexual

□ Pansexual

□ Asexual

□ Other - please describe:

□ Prefer not to say

Ethnicity – Please tick the option below that best describes you

□ Arab

□ Asian/Asian British

□ Indian

□ Pakistani

□ Bangladeshi

□ Chinese

□ Other Asian Background

□ Black African

□ Black Caribbean

□ Black British

□ Irish Gypsy or Traveller

□ White British

□ White and Black Caribbean

□ White and Black African

□ White and Asian

□ White other

□ Other Mixed/Multiple Ethnic background

□ Prefer not to say

Marital status – Please tick the option below that best describes you

□ Single

□ Partnered

□ Married

□ Open relationship

□ Polyamorous

□ Other - please describe:

□ Prefer not to say

HEALTH INFORMATION

Do you currently have a diagnosis of any mental health difficulties?

□ Yes

□ No

If YES – please name below

Do you currently have a diagnosis of any physical health difficulties?

□ Yes
□ No

If YES – please name below

Are you currently receiving any psychological or talking therapies?

□ Yes
□ No

If YES – please name below

Have you received any psychological or talking therapies in the past?

□ Yes
□ No

If YES – please name below

Are you currently taking any medication to help with mental health difficulties
□ Yes
□ No

If YES – please name below

Have you taken any medication to help with mental health difficulties in the past?

□ Yes

□ No

If YES – please name below

Appendix 2K
BMAC Prompt Sheet

We're going to try using imagery in this exercise.

To do this, think of a positive memory that had happened recently, ideally in the past week. Make a note of what that memory is, this can help you stay focussed.

Once you have chosen a memory, we need to get into a comfortable position where you are.

Try **closing your eyes** to help you relax and focus, only do that if you feel happy to do so.

Focus on your breathing. Try to make your breaths slow and deep. Focus on them for a few seconds and notice how it feels.

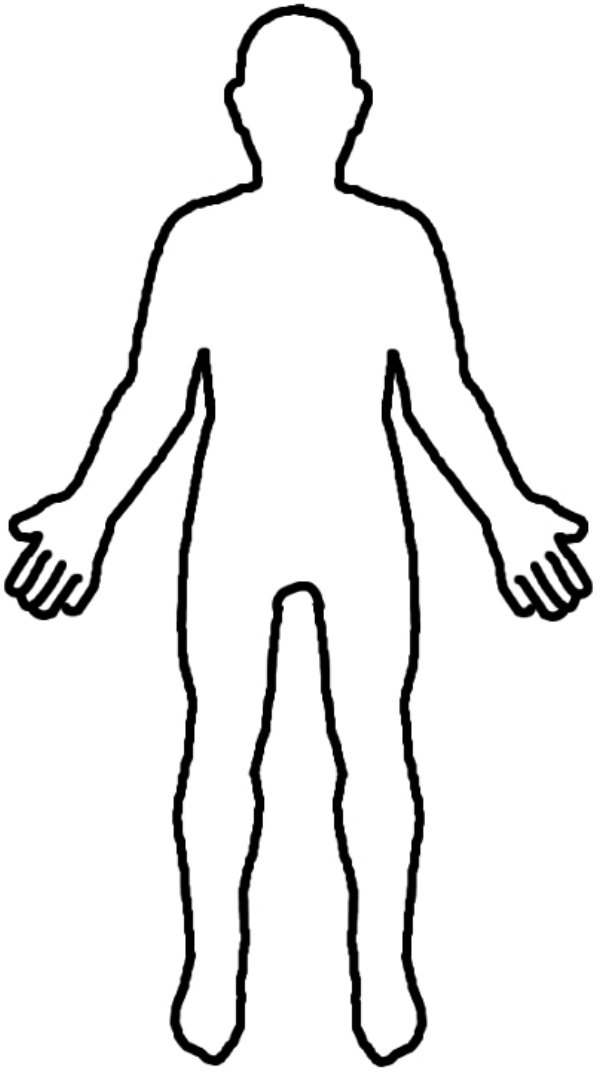
Focus on how your body feels. Concentrate on your muscles relaxing and how your body feels in the chair.

Take a few minutes to do this, it is important to be relaxed before beginning the exercise.

Things to consider during the exercise:

- You are free to move around this image at your will, you can return here at any time.
- Is there a strongest point to this memory you can return to of it begins to fade? Give it a word to help bring you back if needed.
- Focus now on the strongest bit and the most positive bit of this memory.
    - How did it make you feel? Really focus on those feelings.
- Think about what this memory means to you.
    - What went through your mind?
    - Why was it important to you?
- If there were other people in this memory, how did they feel?
    - How does that make you feel – that they feel like this?
- What does this memory mean about your life?
- How can this memory help you?
- Does it show your positive qualities? Think about these qualities.

Now, allow your attention to move to a positive experience.



What can you see?
Try to focus on what you can see in the memory.

- Are you inside or outside?
- What objects or furniture are there?

If other people are there focus on their faces:

- What was their expression?
- Look at their eyes – what colour are they?
- Look at their nose
- Look at their mouth
- What were they wearing?

What can you hear?
Try and focus on what you could hear

- Can you hear music?
- What about traffic or weather sounds?
- Can you hear people? Their

What can you smell?
Try and focus on the smells in the memory.

- Any food/drink?
- Perfume/Aftershave?
- Cut grass?

What can you taste?
Try and focus on any taste in this memory

- Did you eat or drink anything?
- Are you chewing gum?

What can you feel?
Try and focus on the feel of things in the memory.

- Did you touch anything? How did it feel?
- Are you weather a jumper or a coat? Are they warm?
- Can you notice anything underfoot?

When you have moved through all of the senses and you have had enough time in the memory, you can come back to the room. In your own time, slowly shift your attention back to the room. Focus on how your body feels in the chair as you return to this space. Notice your breathing.

When you feel ready, open your eyes. You may wish to add more detail to what you have written, perhaps write down the word you decided to choose.

Appendix 2L

Summary Template

Aim of the study

The study aimed to deliver a mental imagery intervention focusing on using the Broad-Minded Affective Coping (BMAC) technique to help facilitate a more positive way of thinking. The BMAC involved getting you to consider and reflect on a positive memory or experience and the positive emotions associated with it.

What we did

provide a summary of the work covered in the sessions.

What has been helpful?

focus on the key things that the person found beneficial, tailoring this to the individual.

What you have found difficult

highlight any difficulties or challenges, but also include any solutions or suggested solutions for overcoming these issues.

What you have learnt going forward

Summarise key learning points. Things to focus upon include changes in how clients think about their suicidal feelings and associated negative emotions. For example, noting if they realised that these thoughts were fleeting, not uncontrollable, or that they had an exit or alternative to ruminating on thoughts of suicide.

Summary

Your Sincerely

THERAPIST NAME

Paper Three: Critical Appraisal

Word count (excluding references, tables and appendices): 3823

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`Critical Appraisal

1. Overview

This critical appraisal paper will reflect on the processes of developing and delivering the systematic review (paper one) and the empirical paper (paper two). It will consider the strengths, weaknesses, and challenges encountered throughout this research's development and delivery stages. This paper will also reflect on how this research has contributed knowledge to the field. It will include the trainee's reflections on this research journey and suggest positive adaptations for future research.

2. Paper One: Systematic Review

2.1 Study Aims & Rationale for Review

The review's main aim was to explore the relationship between mental imagery and psychosis. It aimed to examine imagery vividness, controllability, and other domains in individuals with psychosis. This topic was chosen due to the prevalence rate of psychosis within the population and the impact this has on individuals' lives. It was selected due to the hypothesised role of mental imagery in these mental health difficulties. In exploring the role of mental imagery in psychosis, it was hoped that this would be helpful to inform the development of effective tailored interventions.

2.2 Choosing a topic

It was found from an initial scoping review that existing reviews had broadly explored the impact of mental imagery on mood and anxiety disorders, self-harm, suicidality and addiction (Ji et al., 2019). To the author's knowledge, no systematic review had solely focused on the relationship between psychosis and mental imagery. It was important to be guided by 'Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA) statement guidelines (Moher et al., 2015). These guidelines were developed to facilitate transparent systematic review reporting. Following these guidelines helped maintain high standards of rigour throughout the systematic review. This review complemented and felt relevant alongside paper two, a pilot study utilising the Broad-Minded Affective Coping Strategy (BMAC) in individuals with psychosis.

2.3 Search strategy

Search terms were developed by consulting the literature, and the goal was to provide a comprehensive coverage of psychosis and mental imagery. Initially, the search terms returned too many articles for this project's scope, and the search had to be refined to meet the needs of the study's timeframe. The university librarians were consulted for guidance on the search,

which the trainee found beneficial. The trainee found it helpful to utilise The Population, Intervention, Comparison, and Outcome tool (PICO; Miller & Forest, 2001) to define the research question clearly and develop specific and focused search terms. The trainee and supervisors felt that the choice of databases (PsycINFO, MEDLINE, Embase, CINAHL, and Google Scholar) was appropriate for capturing a wide range of literature. Using thesaurus terms in PsycINFO and MeSH headings in MEDLINE ensured a comprehensive and standardised search strategy.

2.4 Data synthesis

The decision was made to include all studies that explored mental imagery in individuals with psychosis to complete a comprehensive overview. The trainee, at times, felt overwhelmed with the sheer volume of measures and different aspects of imagery covered within the records. The number of imagery measures within the review highlighted a lack of a 'gold standard' in measuring mental imagery. Due to this, the researcher found it a lengthy process to synthesise the data. The studies included in the review used various methodologies, measures, and definitions, making it difficult to perform a quantitative synthesis or meta-analysis (Popay et al., 2006). This underlines the need for a standardised measurement in future research to ensure consistency and comparability. The narrative approach, organised into imagery themes, allowed the review to integrate and discuss findings from a diverse range of studies. In doing so, this helped to highlight insights and patterns across the literature. The researcher found that an Excel document helped group the relevant studies and information before writing the review. Additionally, the review attempted to account for these differences by critically appraising the methods used and considering this heterogeneity's impact on the overall conclusions.

2.5 Eligibility Criteria

The definition of mental imagery across the literature is varied. Previous systematic reviews were referred to. It was considered that mental imagery could be defined as "Seeing with the mind's eye" (Kosslyn et al., 2001). However, it was highlighted that for this review, it was essential to include a definition which incorporated mental imagery across all sensory modalities due to the population group often experiencing multiple sensory hallucinations. It was decided that mental imagery for this review would be defined as "the simulation or re-creation of perceptual experience across sensory modalities" (Pearson, 2007).

From preliminary scoping searches, it was identified that there is a sheer amount of research exploring mental imagery in individuals with psychosis. Consequently, it was

decided only to include peer-reviewed studies to make the review feasible within the current time frame of the study. One strength of the decision to include only peer-reviewed research is that the overall reliability and validity of the findings in the systematic review are enhanced because peer-reviewed studies have passed through a rigorous evaluation process. However, this approach also has a limitation; it excludes grey literature, which can mean a higher risk of publication bias (Paez, 2017).

To make this review more focused, autobiographical memories that do not explicitly explore imagery components were excluded. For example, studies that primarily discuss general autobiographical recollections without examining the vividness or sensory details of the imagery involved were not considered. The exclusion was deemed appropriate to maintain a clear and targeted scope, meaning the review remained focused. In the initial scoping search, it was identified that many researchers had explored mental imagery in psychosis but had not utilised a healthy comparison group. A healthy control group is a comparison group, allowing researchers to distinguish the effects of the condition or intervention being studied (Malay & Chung, 2012). Studies that did not have a comparison or healthy control group were excluded. While this decision was made to increase the scientific rigor of the evaluation and ensure the validity and reliability of the findings, it also represents a limitation. Excluding these studies prevented the exploration of potentially valuable data from studies without control groups, which might have provided additional insights into the research question.

2.6 Quality appraisal

Following PRISMA guidelines, this review incorporated a thorough risk of bias assessment, essential for evaluating the quality of studies and their findings. Various validated tools were considered for assessing study quality, and after careful deliberation, the JBI Critical Appraisal Checklist for Analytical Cross-Sectional Studies (JBI-MaStARI; Joanna Briggs Institute, 2017) was selected. The JBI's critical appraisal tools assist in assessing published papers' trustworthiness, relevance and results. To further confirm the robustness of the assessment process, 30% of the studies were independently evaluated by a second rater, resulting in high interrater reliability (k = .93). Although it would have been beneficial for all studies to be independently evaluated, time constraints limited the study.

2.7 Conclusions

This review provided an overview of the nuanced relationship between mental imagery and individuals with psychosis. It is acknowledged that the current review had limitations;

however, it has been reflected upon how these limitations were mitigated and how the trainee formed a comprehensive review following PRISMA guidelines. The trainee found the process of the systematic review at times challenging and occasionally lacked confidence; however, the trainee felt that doubting their abilities meant that PRISMA guidelines and a systematic stance were meticulously followed and meant they sought additional guidance from library staff and supervisors throughout the process which assured the trainee. Over time, the trainee's confidence grew in developing the systematic review, which has been a major learning experience for the trainee.

3. Paper Two: Empirical Research

3.1 Study Aims & Rationale

Rates of suicide across the UK are high at 10.7 deaths per 100,000 (Office for National Statistics, 2020). Individuals with psychotic disorders have an elevated risk of suicide (Sher & Kahn, 2019). Suicidal ideation is estimated to affect 41% of individuals with psychosis (Freeman et al., 2019). A large proportion of these individuals will eventually die from suicide (Schwartz & Smith, 2004). Therefore, it is evident that this population group requires effective interventions to target and reduce suicidality (Taylor et al., 2014).

A technique that requires further exploration is the BMAC strategy (Tarrier et al., 2010). The BMAC is a cognitive behavioural treatment that aims to positively affect individuals by generating positive memories and cognitions using mental imagery (Holden et al., 2016). The BMAC aims to target emotional regulation and stress management, help individuals improve self-efficacy, and produce positive memories with emotions connected to them (Tarrier, 2010). There is very preliminary evidence that the BMAC is helpful across various disorders (Panagioti et al., 2012), including individuals with psychosis (Johnson et al., 2012; Tarrier et al., 2013, 2014). Johnson et al. (2012) found happiness and hope increased in just one session in this group. Additionally, the BMAC has also been utilised as a part of a Cognitive Behavioural Suicide Prevention for Psychosis trial (CBSP) (Tarrier & Gooding, 2009; Tarrier et al. 2013, 2014). Individuals in this trial showed improvement in two out of three outcomes of suicidal ideation (Tarrier et al., 2014). It is important to note that CBSP is a long-term intervention, consisting of 20 sessions.

A gap within the current literature is exploring brief therapeutic interventions in this population group. Brief interventions appear to be effective in reducing suicide and suicide attempts (McCabe et al., 2018). They also hold strengths in promptly targeting suicidality and demonstrating a cost-effective option for health services. Additionally, they can reach more

individuals than long-term interventions due to being more time effective. It is imperative to explore the efficacy of brief interventions, especially in the current context of NHS, which is facing overwhelming pressures and challenges (Llyod et al., 2023).

To the author's knowledge, no study to date has utilised the BMAC as a single-armed case series design in individuals with psychosis and suicidal thoughts. Therefore, the empirical paper aimed to build upon preliminary evidence by assessing the acceptability and feasibility of this technique in individuals using a 6-session intervention manual that was recently successfully implemented with students experiencing suicidality (Knagg et al., 2022).

3.2 Developing the study

When developing the study, the research team discussed the suitability of different research designs. The team considered a multiple baseline design. This design attempts to control for the impact of other factors by demonstrating that specific changes are associated with the intervention at different points in time (Kazdin & Kopel, 1975). It was discussed that performing a multiple baseline design with individuals who are experiencing suicidality would be unethical, as this would mean participants would have to wait for treatment for their suicidal thoughts. As a research team, we felt this could escalate participants' risk and increase the chances of adverse events. Therefore, the research team decided that a case series study would be more ethical for this population group; this aligned with previous research (Knagg et al., 2022).

The length of the intervention was discussed within supervision. As previously acknowledged within the literature, there is a gap in brief interventions targeting suicidality in psychosis. Therefore, it was important for the intervention to be considered short. However, we also discussed the need for enough space within the intervention to cover the content and facilitation of the BMAC strategy, which was to be prioritised within sessions. The research team also felt it was important to have space for problem-solving and talking about barriers encountered when practising the BMAC and how the BMAC would be incorporated into the participants' life in future. The trainee researched brief interventions (Weobong et al., 2017; Knagg et al., 2022) and discussed the length of the intervention with the research team. It was concluded that the intervention would take place over six intervention sessions. This followed the same structure as Knagg et al. (2022) single-armed pilot study, which successfully delivered the BMAC to suicidal students.

The trainee felt it would be valuable to meet with individuals who previously had lived experience. The trainee met with individuals from the Lancaster University Public Involvement Network (LUPIN). LUPIN is a programme for current and former clients of clinical psychological services. Research has demonstrated great value in fostering relationships between those delivering and accessing mental health services (Sunkel & Sartor 2021). People with lived experience bring invaluable insights to professionals. The trainee found that meeting with LUPIN helped the trainee develop a greater insight into the experiences of people with psychosis. This meeting highlighted that adaptations to the intervention may be necessary for this population group. It was highlighted that individuals with psychosis could experience hallucinations that occur across all five senses (Auditory, Visual, Tactile, Olfactory, Gustatory), therefore as this intervention engages with all five senses, it was discussed the importance of exploring with participants if they were experiencing any hallucinations at present, as this may interfere with the positive imagery intervention. This was considered when performing the intervention and explored with individuals before starting. This made the trainee reflect within supervision on encompassing a flexible approach when delivering the intervention to meet the needs of people with psychosis. Adaptations were made on a need basis, which helped prevent individuals' distress and allowed them to apply the BMAC strategy despite their current symptoms.

3.3 Eligibility criteria

The current studies' exclusion criteria excluded individuals who were an imminent and immediate risk to self or others, operationalised as the presence of active intent or planning to harm oneself or others shortly (e.g., next month). Individuals with severe learning disabilities or autism were also excluded. People experiencing a crisis may have impaired judgment and cannot provide informed consent (Hamilton et al., 2017). Similarly, individuals with a severe learning disability or autism may be unable to provide informed consent. It was also important to consider that individuals in crisis may need to engage in more suitable alternative support for their circumstances, such as a crisis intervention/crisis support that the trainee did not have the resources to offer. The research team acknowledged that this exclusion criteria can be seen as a limitation as it lacks inclusivity. It was paramount to keep individuals safe, and without adaptations to the current study, the research team would have been unable to cater to these individuals. It would be helpful for future research in this area to be improved by developing visual aids, a simplified consent process, adaptations to the

BMAC strategy, and additional time to explain the study to cater to these individuals' inclusion.

3.4 Recruitment considerations

The study required that individuals be cared for by an Early Intervention Service (EIS), Community Mental Health Team (CMHT) or Integrated Care Hub at the referral point. The research team discussed how this could have excluded individuals experiencing similar conditions but not receiving care from these services. This means that the sample selected may not fully represent the broader population of people with psychosis. Additionally, it was highlighted that due to this inclusion criteria, individuals under CMHT/EIS/Integrated Care Hub are already receiving care from care providers, which may include medication, weekly check-ins, and various support services. To remain ethical, all participants were able to access treatment as usual. Therefore, it is clear that the study's results may reflect more than just the intervention; care already received could act as a confounding variable within the study. Although we acknowledged the apparent limitations of the inclusion criteria, it was concluded through discussion with the research team that this criterion was necessary due to ethical considerations. As the data was collected by the trainee with numerous other commitments, such as placement and university, it was vital to have other professionals involved in individual care to ensure participant safety, which was paramount when considering the vulnerability of this population.

The research team initially discussed that we would aim to recruit 5-10 individuals. This recruitment target was informed by Knagg et al. (2022), who successfully recruited ten students experiencing suicidality. An overlook on the researcher’s behalf was how challenging it would be to recruit individuals with psychosis who are experiencing suicidality. On reflection, this could have been due to several reasons. It has long been acknowledged that patients with psychotic disorders can be especially challenging to recruit (Deckler et al., 2022). The nature of the disorder itself has symptoms of paranoia and distrust, therefore individuals may not easily trust the study or researchers. Other symptoms, such as apathy, lack of motivation and social withdrawal, can also reduce interest in study participation (Izquierdo, 2021).

A reason that the trainee found recruitment challenging could also be due to the trainee residing a long distance from the services and never working within Lancashire and South Cumbria Foundation Trust (LSCFT) before. Therefore, the trainee had no pre-existing relationships with staff and found it difficult to make meaningful relationships, especially

with other course demands such as attending placement and university. To overcome this, the trainee visited several services within LSCFT, spoke to staff, and presented the study to teams, both online and in person. The trainee found it challenging to engage with individuals online sometimes, as staff typically had their cameras off during team meetings. They also found it challenging to communicate with staff by email. This made the trainee reflect on the current pressures within the NHS and the capacity/availability of staff to engage with research studies. The resistance to staff referring to the study could also be due to the vulnerable nature of this population group. Staff may have concerns about a trainee clinical psychologist and whether they have the necessary skills to manage complex cases. Trainees are often considered inexperienced by other staff members (Muddiman et al., 2016).

3.5 Delivery of the BMAC intervention

A therapy manual devised by experts within the area, as previously utilised by Knagg et al. (2022), was followed to deliver the BMAC intervention. This entailed following a structured, manualised approach. It was helpful that supervisors were familiar with the technique and had previously used it in their clinical practice. This helped guide the trainee and gave the trainee greater insight into delivering the BMAC technique. The trainee also found it helpful to attend a training day on the BMAC technique before the delivery. On this training day, the trainee found practising the BMAC with other colleagues particularly helpful; not only did it help the trainee become familiar with the technique, but it also gave the trainee a chance to experience a more personal understanding of the challenges and benefits of the BMAC technique. It was apparent that there were similar barriers with the BMAC across participants. The trainee found supervision helpful to reflect on their issues and vital for guidance. The trainee also found supervision helpful in providing an emotional outlet to express the emotional demands of therapy whilst the intervention was ongoing. The trainee felt that they built confidence in supporting clients with this technique. The trainee reflected on how the intervention has been an invaluable learning experience for their clinical skills and research.

3.6 Risk within the Study

With the nature of this population group, Serious Adverse Events (SAE's) and Adverse Events (AE's) were to be expected. In recruiting individuals with psychosis, it can be challenging to retain individuals due to their fluctuating mental state and potential for hospitalisation or relapse (Deckler et al., 2022). Before the study started, a detailed risk protocol was implemented and discussed multiple times within supervision. The trainee spent

additional time studying the additional documents. The current study consisted of multiple AE's and SAE's throughout. Ensuring participants' safety was paramount. It was necessary to follow the correct procedures, such as documenting all risks and talking to the care coordinators and individuals involved in participants' care. Under the circumstances, this, at times, could feel quite stressful for the trainee whilst balancing course demands and placement. Having weekly supervision with supervisors helped ease the trainee's anxieties and helped with this process. The trainee reflected upon the risk in the present population group and often felt that risk took priority in sessions. This meant some sessions felt more risk-focused, and less time may have been spent on the intervention. It was reflected how an adaptation for this intervention for individuals with psychosis could be receiving the BMAC for up to eight sessions.

3.7 Clinical implications and future research

This is the first research to look at the acceptability and feasibility of a six-session design in individuals with psychosis. The high satisfaction rate among participants in the current study is promising. However, the results should be interpreted cautiously due to the difficulties in recruiting participants, the small sample size of this study, and the lack of a control group in the current study. Therefore, to determine the true reflections of the BMAC strategy in individuals with psychosis, a larger pilot study with a control group should be utilised. Nevertheless, this study has important clinical implications. Case series and feasibility studies hold strengths in identifying appropriate adaptations to the intervention for the future (Eldridge et al., 2016). Increasing the sessions up to eight sessions for individuals with psychosis may help to meet the specific needs of this population group and give individuals a greater amount of time to engage with the BMAC. Other adaptations could involve having more significant input from care providers during the BMAC intervention. Care coordinators could be invited to sessions to understand how the technique works, and, with consent, the therapeutic blueprint could be shared with care providers. Having other staff encourage the participants to practice the BMAC could be helpful. This could also help individuals engage with the intervention after therapy when individuals do not have contact with the therapist. The brief nature of the BMAC adds to the promise of this intervention, as it is short and easy to apply to daily life. As it is a brief intervention, it is viewed as a positive and cost-effective development to help combat the increase in demand for services and provide timely support to those in need of care. Another suggestion for future research could be incorporating qualitative feedback from participants. Qualitative research is vital to

address the how and why research questions better to understand the intervention (Busetto et al., 2020), and was missed in this current study.

3.8 Conclusion

To conclude, the thesis presents two related papers that offer greater insight into mental imagery and how it could be used as a treatment in individuals with psychosis. These findings are particularly relevant to clinical psychologists in assessing and implementing interventions for individuals with psychosis. The literature review demonstrated that mental imagery is altered within individuals with psychosis. However, further high-quality research is required to make absolute conclusions. The empirical paper shows that individuals with psychosis may benefit from the BMAC Strategy, as participants demonstrated high levels of satisfaction with the technique. However, a limitation of the empirical paper was that the trainee experienced difficulties with recruitment, and a higher sample size was needed. The trainee encountered multiple challenges at different stages of the research process. Supervision, service user involvement and published guidelines helped to inform the trainee to help make suitable decisions. The trainee has developed confidence in this type of research and hopes to continue this research journey in future practice.

4.0 References

Bester, J., Cole, C. M., & Kodish, E. (2016). The limits of informed consent for an overwhelmed patient: clinicians' role in protecting patients and preventing overwhelm. *AMA Journal of Ethics*, *18*(9), 869–886. https://doi.org/10.1001/journalofethics.2016.18.9.peer2-1609.

Busetto, L., Wick, W., & Gumbinger, C. (2020). How to use and assess qualitative research methods. *Neurological Research and Practice*, *2*(1), 1–10. https://doi.org/10.1186/s42466-020-00059-z

Deckler, E., Ferland, M., Brazis, S., Mayer, M. R., Carlson, M., & Kantrowitz, J. T. (2022). Challenges and Strategies for the Recruitment of Patients With Schizophrenia in a Research Setting. *The International Journal of Neuropsychopharmacology*, *25*(11), 924–932. https://doi.org/10.1093/ijnp/pyac058

Eldridge, S. M., Lancaster, G. A., Campbell, M. J., Thabane, L., Hopewell, S., Coleman, C. L., & Bond, C. M. (2016). Defining Feasibility and Pilot Studies in Preparation for Randomised Controlled Trials: Development of a Conceptual Framework. *PLOS ONE*, *11*(3), e0150205. https://doi.org/10.1371/journal.pone.0150205

Freeman, D., Bold, E., Chadwick, E., Taylor, K. M., Collett, N., Diamond, R., ... & Waite, F. (2019). Suicidal ideation and behaviour in patients with persecutory delusions: Prevalence, symptom associations, and psychological correlates. *Comprehensive Psychiatry*, *93*, 41-47. https://doi.org/10.1016/j.comppsych.2019.07.001

Hamilton, J., Ingham, B., McKinnon, I., Parr, J. R., Tam, L. Y.-C., & Le Couteur, A. (2017). Mental capacity to consent to research? Experiences of consenting adults with intellectual disabilities and/or autism to research. *British Journal of Learning Disabilities*, *45*(4), 230–237. https://doi.org/10.1111/bld.12198

Holden, N., Kelly, J., Welford, M., & Taylor, P. J. (2016a). Emotional response to a therapeutic technique: The social Broad Minded Affective Coping. *Psychology and Psychotherapy: Theory, Research and Practice*, *90*(1), 55–69. https://doi.org/10.1111/papt.12095

Izquierdo, A., Cabello, M., Leal, I., Mellor-Marsá, B., Ayora, M., Bravo-Ortiz, M.-F., Rodriguez-Jimenez, R., Ibáñez, Á., MacDowell, K. S., Malpica, N., Díaz-Marsá, M., Baca-

García, E., Fares-Otero, N. E., Melero, H., López-García, P., Díaz-Caneja, C. M., Arango, C., Ayuso-Mateos, J. L., García-Albea, J., & Saiz-González, D. (2021). The interplay between functioning problems and symptoms in first episode of psychosis: An approach from network analysis. *Journal of Psychiatric Research*, *136*, 265–273. https://doi.org/10.1016/j.jpsychires.2021.02.024

Ji, J. L., Kavanagh, D. J., Holmes, E. A., MacLeod, C., & Di Simplicio, M. (2019). Mental imagery in psychiatry: conceptual & clinical implications. *CNS Spectrums*, *24*(1), 114–126. https://doi.org/10.1017/s1092852918001487

Joanna Briggs Institute. (2017). *Checklist for Analytical Cross Sectional Studies Critical Appraisal Checklist for Analytical Cross Sectional Studies 2*. https://jbi.global/sites/default/files/2019-05/JBI_Critical_Appraisal-Checklist_for_Analytical_Cross_Sectional_Studies2017_0.pdf

Johnson, J., Gooding, P. A., Wood, A. M., Fair, K. L., & Tarrier, N. (2012). A Therapeutic Tool for Boosting Mood: The Broad-Minded Affective Coping Procedure (BMAC). *Cognitive Therapy and Research*, *37*(1), 61–70. https://doi.org/10.1007/s10608-012-9453-8

Kazdin, A. E., & Kopel, S. A. (1975). On resolving ambiguities of the multiple-baseline design: Problems and recommendations. *Behavior Therapy*, *6*(5), 601-608. https://doi.org/10.1016/S0005-7894(75)80181-X.

Knagg, H., Pratt, D., Taylor, P. J., & Palmier-Claus, J. (2022). A positive mental imagery intervention for targeting suicidal ideation in university students: A pilot study. *Clinical Psychology & Psychotherapy*. https://doi.org/10.1002/cpp.2720

Kosslyn, S. M., Ganis, G., & Thompson, W. L. (2001). Neural foundations of imagery. *Nature reviews neuroscience*, *2*(9), 635-642.

Lloyd, A., Briggs, D., Ellis, A., & Telford, L. (2023). Critical Reflections on the COVID-19 Pandemic from the NHS Frontline. *Sociological Research Online*, *29*(1), 136078042311562. https://doi.org/10.1177/13607804231156293

Malay, S., & Chung, K. C. (2012). The Choice of Controls for Providing Validity and Evidence in Clinical Research. *Plastic and Reconstructive Surgery*, *130*(4), 959–965. https://doi.org/10.1097/prs.0b013e318262f4c8

McCabe, R., Garside, R., Backhouse, A., & Xanthopoulou, P. (2018). Effectiveness of brief psychological interventions for suicidal presentations: a systematic review. *BMC Psychiatry*, *18*(1). https://doi.org/10.1186/s12888-018-1663-5

Miller, S. A., & Forrest, J. L. (2001). Enhancing your practice through evidence-based decision making: PICO, learning how to ask good questions. *Journal of Evidence Based Dental Practice*, *1*(2), 136–141. https://doi.org/10.1016/s1532-3382(01)70024-3

Moher, D., Shamseer, L., Clarke, M., Ghersi, D., Liberati, A., Petticrew, M., Shekelle, P., & Stewart, L. A. (2015). Preferred Reporting Items for Systematic Review and meta-analysis Protocols (PRISMA-P) 2015 Statement. *Systematic Reviews*, *4*(1), 1–9. https://pubmed.ncbi.nlm.nih.gov/25554246/

Muddiman, E., Alison Deborah Bullock, MacDonald, J., Allery, L., Webb, K., & Pugsley, L. (2016). "It's surprising how differently they treat you": a qualitative analysis of trainee reflections on a new programme for generalist doctors. *BMJ Open*, *6*(9), e011239–e011239. https://doi.org/10.1136/bmjopen-2016-011239

Office for National Statistics. Suicides in England and Wales: 2020 registrations. ONS, 2020 Retrieved from:(https://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/deaths/bulletins/suicidesintheunitedkingdom/latest)

Paez, A. (2017). Grey Literature: an Important Resource in Systematic Reviews. *Journal of Evidence-Based Medicine*, *10*(3), 233–240. https://doi.org/10.1111/jebm.12265

Panagioti, M., Gooding, P. A., & Tarrier, N. (2012). An empirical investigation of the effectiveness of the broad-minded affective coping procedure (BMAC) to boost mood among individuals with posttraumatic stress disorder (PTSD). *Behaviour Research and Therapy*, *50*(10), 589–595. https://doi.org/10.1016/j.brat.2012.06.005

Pearson, D. G. (2007). *Mental imagery and creative thought*. In *Proceedings-British Academy* (Vol. 1, No. 147, pp. 187-212). Oxford University Press.

Popay, J., Roberts, H., Sowden, A., Petticrew, M., Arai, L., Rodgers, M., Britten, N., Roen, K., & Duffy, S. (2006). *Guidance on the Conduct of Narrative Synthesis in Systematic Reviews a Product from the ESRC Methods Programme*. https://citeseerx.ist.psu.edu/document?repid=rep1&type=pdf&doi=ed8b23836338f6fdea0cc55e161b0fc5805f9e27

Schwartz, R. C., & Smith, S. D. (2004). Suicidality and psychosis: the predictive potential of symptomatology and insight into illness. *Journal of Psychiatric Research*, *38*(2), 185–191. https://doi.org/10.1016/s0022-3956(03)00088-8

Sher, L., & Kahn, R. (2019). Suicide in Schizophrenia: An Educational Overview. *Medicina*, *55*(7), 361. https://doi.org/10.3390/medicina55070361

Suicidal ideation and behaviour in patients with persecutory delusions: Prevalence, symptom associations, and psychological correlates. (2019). *Comprehensive Psychiatry*, *93*, 41–47. https://doi.org/10.1016/j.comppsych.2019.07.001

Sunkel, C., & Sartor, C. (2021). Perspectives: Involving Persons with Lived Experience of Mental Health Conditions in Service delivery, Development and Leadership. *BJPsych Bulletin*, *46*(3), 1–4. https://doi.org/10.1192/bjb.2021.51

Tarrier, N. (2010). Broad minded affective coping (BMAC): A "Positive" CBT approach to facilitating positive emotions. *International Journal of Cognitive Therapy*, *3*(1), 64–76. https://doi.org/10.1521/ijct.2010.3.1.64

Tarrier, N., Gooding, P., Pratt, D., Kelly, J., Awenat, Y., & Maxwell, J. (2013). Cognitive Behavioural Prevention of Suicide in Psychosis: A treatment manual (1st ed.). Routledge. https://doi.org/10.4324/9780203066881

Tarrier, N., Kelly, J., Maqsood, S., Snelson, N., Maxwell, J., Law, H., Dunn, G., & Gooding, P. (2014). The cognitive behavioural prevention of suicide in psychosis: A clinical trial. *Schizophrenia Research, 156*(2-3), 204–210. https://doi.org/10.1016/j.schres.2014.04.029

Taylor, P. J., Hutton, P., & Wood, L. (2014). Are people at risk of psychosis also at risk of suicide and self-harm? A systematic review and meta-analysis. *Psychological Medicine*, *45*(05), 911–926. https://doi.org/10.1017/s0033291714002074

Weobong, B., Weiss, H. A., McDaid, D., Singla, D. R., Hollon, S. D., Nadkarni, A., Park, A-La., Bhat, B., Katti, B., Anand, A., Dimidjian, S., Araya, R., King, M., Vijayakumar, L., Wilson, G. T., Velleman, R., Kirkwood, B. R., Fairburn, C. G., & Patel, V. (2017). Sustained effectiveness and cost-effectiveness of the Healthy Activity Programme, a brief psychological treatment for depression delivered by lay counsellors in primary care: 12-month follow-up of a randomised controlled trial. *PLOS Medicine*, *14*(9), e100238

Section Four: Ethics

1.Ethics approval

Health Research Authority

North West - Preston Research Ethics Committee

2 Redman Place
Stratford
London
E20 1JQ

Please note: This is the favourable opinion of the REC only and does not allow you to start your study at NHS sites in England until you receive HRA Approval

19 July 2023

Professor Bill Sellwood
Furness Building
Lancaster University
Lancaster
LA1 4YG

Dear Professor Sellwood

Study title:	**Exploring the use of a positive mental imagery intervention for targeting suicidal ideation in psychosis.**
REC reference:	**23/NW/0151**
Protocol number:	**NA**
IRAS project ID:	**316706**

Thank you for your letter of 13 July 2023, responding to the Research Ethics Committee's (REC) 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 Sally Robinson and Suzanna Martin.

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.

Good practice principles and responsibilities

The UK Policy Framework for Health and Social Care Research sets out principles of good practice in the management and conduct of health and social care research. It also outlines the responsibilities of individuals and organisations, including those related to the four elements of research transparency:

1. registering research studies
2. reporting results
3. informing participants
4. sharing study data and tissue

Conditions of the favourable opinion

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

Confirmation of Capacity and Capability (in England, Northern Ireland and Wales) or NHS management permission (in Scotland) 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 HRA and HCRW Approval (England and Wales)/ NHS permission for research is available in the Integrated Research Application System.

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 research should be registered in a publicly accessible database and we expect all researchers, research sponsors and others to meet this fundamental best practice standard.

It is a condition of the REC favourable opinion that **all clinical trials are registered** on a publicly accessible database within six weeks of recruiting the first research participant. For this purpose, 'clinical trials' are defined as:

- clinical trial of an investigational medicinal product
- clinical investigation or other study of a medical device

- combined trial of an investigational medicinal product and an investigational medical device
- other clinical trial to study a novel intervention or randomised clinical trial to compare interventions in clinical practice.

Failure to register a clinical trial is a breach of these approval conditions, unless a deferral has been agreed by the HRA (for more information on registration and requesting a deferral see: Research registration and research project identifiers).

If you have not already included registration details in your IRAS application form you should notify the REC of the registration details as soon as possible.

Publication of Your Research Summary

We will publish your research summary for the above study on the research summaries section of our website, together with your contact details, no earlier than three months from the date of this favourable opinion letter.

Should you wish to provide a substitute contact point, make a request to defer, or require further information, please visit:
https://www.hra.nhs.uk/planning-and-improving-research/application-summaries/research-summaries/

N.B. If your study is related to COVID-19 we will aim to publish your research summary within 3 days rather than three months.

During this public health emergency, it is vital that everyone can promptly identify all relevant research related to COVID-19 that is taking place globally. If you haven't already done so, please register your study on a public registry as soon as possible and provide the REC with the registration detail, which will be posted alongside other information relating to your project. We are also asking sponsors not to request deferral of publication of research summary for any projects relating to COVID-19. In addition, to facilitate finding and extracting studies related to COVID-19 from public databases, please enter the WHO official acronym for the coronavirus disease (COVID-19) in the full title of your study. Approved COVID-19 studies can be found at:
https://www.hra.nhs.uk/covid-19-research/approved-covid-19-research/

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).

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, including early termination of the study

- Final report
- Reporting results

The latest guidance on these topics can be found at https://www.hra.nhs.uk/approvals-amendments/managing-your-approval/.

Ethical review of research sites

NHS/HSC sites

The favourable opinion applies to all NHS/HSC sites taking part in the study, subject to confirmation of Capacity and Capability (in England, Northern Ireland and Wales) or management permission (in Scotland) 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 materials calling attention of potential participants to the research [Poster V2]	2	03 July 2023
Evidence of Sponsor insurance or indemnity (non NHS Sponsors only) [EI PL and PI Insurance Certs 2022-2023]		01 August 2022
GP/consultant information sheets or letters [Clinician_GP letter_V1 15_01_2023_IRAS ID-316706]	1	15 January 2023
GP/consultant information sheets or letters [End of study letter V1 15_01_2023_IRAS ID- 316706]	1	15 January 2023
IRAS Application Form [IRAS_Form_28042023]		28 April 2023
IRAS Checklist XML [Checklist_13072023]		13 July 2023
Letter from sponsor [IRAS sponsorship Letter 27 03 2023]		27 March 2023
Non-validated questionnaire [Demographic questionnaire V1 15_01_22 IRAS ID-316706]	1	15 January 2023
Other [Service referral form V1 15_01_2023]	1	15 January 2023
Other [Risk Protocol V2 17_03_2023]	2	17 March 2023
Other [AE Report V1 15_01_2023_IRAS ID-316706]	1	15 January 2023
Other [SAE Report V1 15_01_2023_ IRAS ID-316706]	1	15 January 2023
Other [Good Clinical Practice Certificate Claudia Daley]	1	06 January 2023
Other [Good Clinical Practice Jasper Palmier-Claus]	1	19 August 2021
Other [12 week follow up CRF]	1	07 May 2023
Other [8 week follow up CRF]	1	07 May 2023
Other [Scientific review feedback]		
Other [Response to IRAS]		07 July 2023
Participant consent form [Participant consent form V2 15_06_2023 IRAS ID- 316706 (1)]	2	15 June 2023
Participant information sheet (PIS) [PIS V3 14_06_2023]	3	14 June 2023
Research protocol or project proposal [Research Protocol V3 14_06_2023]	3	14 June 2023

Summary CV for Chief Investigator (CI) [Bill Sellwood CV]	1	22 October 2022
Summary CV for student [Claudia Daley CV 7.04.23]	1	07 April 2023
Summary CV for supervisor (student research) [Dr Jasper Palmier-Claus CV 2.04]	1	02 April 2023
Validated questionnaire [Baseline CRF, version 1; 5/04/2023; 316706]		05 April 2023

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.

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 Learning

We are pleased to welcome researchers and research staff to our HRA Learning Events and online learning opportunities– see details at:
https://www.hra.nhs.uk/planning-and-improving-research/learning/

IRAS project ID: 316706 Please quote this number on all correspondence

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

Yours sincerely

PP
Chair
Sally Robinson
Email:preston.rec@hra.nhs.uk

Enclosures: "After ethical review – guidance for researchers"

After ethical review guidance for sponsors and investigators – Non CTIMP Standard Conditions of Approval

2. IRAS Ethics form

IRAS Form | Reference: 23/NW/0151 | IRAS Version 6.3.5

Welcome to the Integrated Research Application System

IRAS Project Filter

The integrated dataset required for your project will be created from the answers you give to the following questions. The system will generate only those questions and sections which (a) apply to your study type and (b) are required by the bodies reviewing your study. Please ensure you answer all the questions before proceeding with your applications.

Please complete the questions in order. If you change the response to a question, please select 'Save' and review all the questions as your change may have affected subsequent questions.

Please enter a short title for this project (maximum 70 characters)
A positive mental imagery intervention for suicidality in psychosis.

1. Is your project research?

(●) Yes ( ) No

2. Select one category from the list below:

( ) Ionising Radiation for combined review of clinical trial of an investigational medicinal product
( ) Ionising Radiation and Devices form for combined review of combined trial of an investigational medicinal product and an investigational medical device
( ) Clinical investigation or other study of a medical device
(●) Other clinical trial to study a novel intervention or randomised clinical trial to compare interventions in clinical practice
( ) Basic science study involving procedures with human participants
( ) Study administering questionnaires/interviews for quantitative analysis, or using mixed quantitative/qualitative methodology
( ) Study involving qualitative methods only
( ) Study limited to working with human tissue samples (or other human biological samples) and data (specific project only)
( ) Study limited to working with data (specific project only)
( ) Research tissue bank
( ) Research database

If your work does not fit any of these categories, select the option below:

( ) Other study

2a. Will the study involve the use of any medical device without a UKCA/CE UKNI/CE Mark, or a UKCA/CE UKNI/CE marked device which has been modified or will be used outside its intended purposes?

( ) Yes (●) No

2b. Please answer the following question(s):

a) Does the study involve the use of any ionising radiation? ( ) Yes (●) No

b) Will you be taking new human tissue samples (or other human biological samples)? ( ) Yes (●) No

c) Will you be using existing human tissue samples (or other human biological samples)? ◯ Yes ◉ No

3. In which countries of the UK will the research sites be located? *(Tick all that apply)*

- ☑ England
- ☐ Scotland
- ☐ Wales
- ☐ Northern Ireland

3a. In which country of the UK will the lead NHS R&D office be located:

- ◉ England
- ◯ Scotland
- ◯ Wales
- ◯ Northern Ireland
- ◯ This study does not involve the NHS

4. Which applications do you require?

- ☑ IRAS Form
- ☐ Confidentiality Advisory Group (CAG)
- ☐ HM Prison and Probation Service (HMPPS)

5. Will any research sites in this study be NHS organisations?

◉ Yes ◯ No

5a. Are all the research costs and infrastructure costs (funding for the support and facilities needed to carry out the research e.g. NHS support costs) for this study provided by a NIHR Biomedical Research Centre (BRC), NIHR Applied Research Collaboration (ARC), NIHR Patient Safety Translational Research Centre (PSTRC), or an NIHR Medtech and In Vitro Diagnostic Co-operative (MIC) in all study sites?

Please see information button for further details.

◯ Yes ◉ No

Please see information button for further details.

5b. Do you wish to make an application for the study to be considered for NIHR Clinical Research Network (CRN) Support and inclusion in the NIHR Clinical Research Network Portfolio?

Please see information button for further details.

◯ Yes ◉ No

The NIHR Clinical Research Network (CRN) provides researchers with the practical support they need to make clinical studies happen in the NHS in England e.g. by providing access to the people and facilities needed to carry out research "on the ground".

If you select yes to this question, information from your IRAS submission will automatically be shared with the NIHR CRN. ***Submission of a Portfolio Application Form (PAF) is no longer required.***

6. Do you plan to include any participants who are children?

○ Yes ◉ No

7. Do you plan at any stage of the project to undertake intrusive research involving adults lacking capacity to consent for themselves?

○ Yes ◉ No

Answer Yes if you plan to recruit living participants aged 16 or over who lack capacity, or to retain them in the study following loss of capacity. Intrusive research means any research with the living requiring consent in law. This includes use of identifiable tissue samples or personal information, except where application is being made to the Confidentiality Advisory Group to set aside the common law duty of confidentiality in England and Wales. Please consult the guidance notes for further information on the legal frameworks for research involving adults lacking capacity in the UK.

8. Do you plan to include any participants who are prisoners or young offenders in the custody of HM Prison Service or who are offenders supervised by the probation service in England or Wales?

○ Yes ◉ No

9. Is the study or any part of it being undertaken as an educational project?

◉ Yes ○ No

Please describe briefly the involvement of the student(s):
This is part of an individual student doctorate qualification. The student will be co-lead on the project and will be the one carrying out a large proportion of the research activity. The student is receiving supervision from her supervisors whilst conducting the study.

9a. Is the project being undertaken in part fulfilment of a PhD or other doctorate?

◉ Yes ○ No

10. Will this research be financially supported by the United States Department of Health and Human Services or any of its divisions, agencies or programs?

○ Yes ◉ No

11. Will identifiable patient data be accessed outside the care team without prior consent at any stage of the project (including identification of potential participants)?

○ Yes ◉ No

Integrated Research Application System
Application Form for Other clinical trial or investigation

IRAS Form (project information)

Please refer to the E-Submission and Checklist tabs for instructions on submitting this application.

The Chief Investigator should complete this form. Guidance on the questions is available wherever you see this symbol displayed. We recommend reading the guidance first. The complete guidance and a glossary are available by selecting Help.

Please define any terms or acronyms that might not be familar to lay reviewers of the application.

Short title and version number: (maximum 70 characters - this will be inserted as header on all forms)
A positive mental imagery intervention for suicidality in psychosis.

Please complete these details after you have booked the REC application for review.

REC Name:
North West - Preston Research Ethics Committee

REC Reference Number:
23/NW/0151

Submission date:
28/04/2023

PART A: Core study information

1. ADMINISTRATIVE DETAILS

A1. Full title of the research:

Exploring the use of a positive mental imagery intervention for targeting suicidal ideation in psychosis.

A2-1. Educational projects

Name and contact details of student(s):

Student 1

	Title	Forename/Initials	Surname
	Miss	Claudia	Daley
Address	2 The Heyes		
	Woolton		
	Liverpool		
Post Code	L25 8RX		
E-mail	c.daley@lancaster.ac.uk		
Telephone	07519662014		
Fax			

Give details of the educational course or degree for which this research is being undertaken:

Name and level of course/ degree:
Doctorate in Clinical Psychology

Name of educational establishment:
Lancaster University

Name and contact details of academic supervisor(s):

Academic supervisor 1

	Title	Forename/Initials	Surname
	Dr	Jasper	Palmier-Claus
Address	Health Innovation Campus		
	Lancaster Univeristy		
	Lancaster		
Post Code	LA14YW		
E-mail	j.palmier-claus@lancaster.ac.uk		
Telephone	01524663086		
Fax			

Academic supervisor 2

	Title	Forename/Initials	Surname
	Prof	Bill	Sellwood
Address	Health Innovation Campus		
	Lancaster Univeristy		
	Lancaster		
Post Code	LA14YW		
E-mail	b.sellwood@lancaster.ac.uk		
Telephone			
Fax			

Please state which academic supervisor(s) has responsibility for which student(s):
Please click "Save now" before completing this table. This will ensure that all of the student and academic supervisor details are shown correctly.

Student(s)	Academic supervisor(s)
Student 1 Miss Claudia Daley	☑ Dr Jasper Palmier-Claus ☑ Prof Bill Sellwood

A copy of a current CV for the student and the academic supervisor (maximum 2 pages of A4) must be submitted with the application.

A2-2. Who will act as Chief Investigator for this study?

- ○ Student
- ◉ Academic supervisor
- ○ Other

A3-1. Chief Investigator:

	Title	Forename/Initials	Surname
	Professor	Bill	Sellwood
Post	Programme Director		
Qualifications	PhD - 2001 Clinical Psychology - University of Manchester MSc – 1989 - Clinical Psychology University of Manchester - Qualification as a clinical psychologist BSc1987 - Psychology (2i) - University of Manchester		
ORCID ID	0000 0001 8260 9503		
Employer	Lancaster University		
Work Address	Health Innovation Campus Lancaster University Lancaster		
Post Code	LA14YW		
Work E-mail	b.sellwood@lancaster.ac.uk		
* Personal E-mail	b.sellwood@lancaster.ac.uk		
Work Telephone	+44 (0)1524 592028.		
* Personal Telephone/Mobile	+44 (0)1524 592028.		
Fax	+44 (0)1524 592028		

** This information is optional. It will not be placed in the public domain or disclosed to any other third party without prior consent.*
A copy of a current CV (maximum 2 pages of A4) for the Chief Investigator must be submitted with the application.

A4. Who is the contact on behalf of the sponsor for all correspondence relating to applications for this project?
This contact will receive copies of all correspondence from REC and HRA/R&D reviewers that is sent to the CI.

	Title	Forename/Initials	Surname
	Miss	Rebecca	Gordon
Address	Lancaster University Bowland Main Lancaster		
Post Code	LA1 4YT		
E-mail	sponsorship@lancaster.ac.uk		
Telephone	01524510188		
Fax	0		

A5-1. Research reference numbers. *Please give any relevant references for your study:*

Applicant's/organisation's own reference number, e.g. R & D (if available):	NA
Sponsor's/protocol number:	NA
Protocol Version:	2
Protocol Date:	17/03/2023
Funder's reference number (enter the reference number or state not applicable):	NA
Project website:	NA

Registry reference number(s):
The UK Policy Framework for Health and Social Care Research sets out the principle of making information about research publicly available. Furthermore: Article 19 of the World Medical Association Declaration of Helsinki adopted in 2008 states that "every clinical trial must be registered on a publicly accessible database before recruitment of the

first subject"; and the International Committee of Medical Journal Editors (ICMJE) will consider a clinical trial for publication only if it has been registered in an appropriate registry. Please see guidance for more information.

International Standard Randomised Controlled Trial Number (ISRCTN):
ClinicalTrials.gov Identifier (NCT number):

Additional reference number(s):

Ref.Number Description	Reference Number
IRAS ID	316706

A5-2. Is this application linked to a previous study or another current application?

○ Yes ◉ No

Please give brief details and reference numbers.

2. OVERVIEW OF THE RESEARCH

To provide all the information required by review bodies and research information systems, we ask a number of specific questions. This section invites you to give an overview using language comprehensible to lay reviewers and members of the public. Please read the guidance notes for advice on this section.

A6-1. Summary of the study. *Please provide a brief summary of the research (maximum 300 words) using language easily understood by lay reviewers and members of the public. Where the research is reviewed by a REC within the UK Health Departments' Research Ethics Service, this summary will be published on the Health Research Authority (HRA) website following the ethical review. Please refer to the question specific guidance for this question.*

People with psychosis, experiencing hallucinations and delusional beliefs, are vulnerable to suicidal ideation.This pilot study aims to explore the acceptability and feasibility of a new talking therapy called the Broad-Minded Affective Coping (BMAC) intervention. The BMAC is a brief intervention, that is manualised and structured. Participants will be asked to focus on positive memories. This intervention may help individuals to reduce suicidal ideation.

We aim to complete a single group pilot study of 5-10 individuals with experiences of psychosis and suicidal thoughts. The intervention will consist of six 1-hour individual therapy sessions delivered over a six week period.These sessions will include rapport building, positive mental imagery exercises, debriefing as well as reviewing progress and future planning. The positive mental imagery exercises consists of the therapist firstly implementing relaxation techniques and then guiding the participant through their positive memory of choice via engagement of the recalled senses (touch, taste, sight, smell and sound). Participants will then recall how they felt and will feedback. Between sessions practice will also be encouraged by therapist, and materials will be given to help participants engage in this. Suicidality of participants will be measured before intervention, after 6 weeks and at a 12 week follow up. Risk will firstly be assessed at baseline and in first session of the BMAC intervention. Risk will be continued to be monitored throughout the study.

This study aims to build upon preliminary evidence, that shows the promise of this method. No study to date has used this method as a stand-alone case-series (6 session) design in individuals with psychosis. Therefore, this study aims to help bridge the current gap of research in this area, with the hope of guiding future research/informing clinical trials.

A6-2. Summary of main issues. *Please summarise the main ethical, legal, or management issues arising from your study and say how you have addressed them.*

Not all studies raise significant issues. Some studies may have straightforward ethical or other issues that can be identified and managed routinely. Others may present significant issues requiring further consideration by a REC, HRA, or other review body (as appropriate to the issue). Studies that present a minimal risk to participants may raise complex organisational or legal issues. You should try to consider all the types of issues that the different reviewers may need to consider.

Recruitment
5-10 individuals with psychosis will be recruited from community mental health teams or early intervention services at

the point of referral. Recruitment will take place across Lancashire & South Cumbria NHS Foundation Trust. Individuals will be approached by NHS professional staff members to ascertain whether they would like to take part in the study. Individuals will then be contacted by the trainee clinical psychologist who will discuss participation and details over the phone with the potential participant. Participants will be informed that recruitment is completely voluntary and will not affect the standard of care that they receive. There will be no pressure to take part. Prior to participating in the study, the trainee clinical psychologist will provide all potential participants with a written copy of the participant information sheet (PIS). Individuals that show interest in the study, will have at least 24 hours to decide whether they would like to participate. In all instances, researchers will provide participants with the opportunity to read the PIS, ask questions about the research, and have their questions answered satisfactorily. Before completing the baseline assessments, participants will sign a written consent form or provide audio-recorded consent. The information sheet will state that participation is entirely voluntary and that participants are free to withdraw from the study at any point. Lack of capacity to consent will be an exclusion criterion for participants. If capacity is in doubt, a senior clinician will conduct a capacity assessment prior to the participant taking part.

Distress/discomfort from assessments
The measures (questionnaires) administered to participants could contain questions that participants may find distressing. It is important to note that research has demonstrated that asking individuals about suicidal thoughts and feelings does not increase the risk for the individual and can be a positive experience for the individual (Dazzi, 2014). It could be the case that participants could become emotional or feel uncomfortable when talking about this information. Potential participants will be made aware the nature of these questions prior to commencing the study. Participants will be told that they are able to stop these questionnaires at any time and are not obligated to complete these questionnaires. Researchers will encourage participants to take breaks if required or leave any questions they don't feel comfortable with unanswered. If a participant shows distress/becomes emotional, the trainee clinical psychologist has received training to offer a non-judgemental, warm, empathetic safe space for participant to explore feelings if they wish to. They can also offer support as well as signposting if required. The trainee clinical psychologist has received training for identifying and responding to emotional distress. A follow-up call (after 24 hours) will be offered to any participant that shows distress to have a check in on how they are now feeling, in order to check the participant's distress levels. Signposting will be provided for individuals, and the researcher will make sure to give participants support and crisis phone numbers for their local area and participants will also be encouraged to access help from their GP and care provider. The trainee clinical psychologist will be supported by two qualified clinical psychologists throughout the study, who will provide a space for debriefing and a space for supervision. The trainee clinical psychologist will have a point of contact to refer to if she is unable to deal with the situation at the time or needs extra support.

Risk protocols and distress protocols will be adhered to by researchers at all times throughout the study, in the disclosure of risk and safeguarding issues. The risk protocol put in place has been used in previous studies and has been co-developed between people with lived experience of suicidality and researchers. Assessments within the study will be conducted in the location of participants' preference such as remote (online – Microsoft Teams), their own home, or rooms available in GP surgeries or their current care provider in Lancashire and South Cumbria NHS Foundation Trust.

Participant burden
As initial assessment and collecting data could take up to 75 minutes, clients participating within the study will be offered breaks by the researcher. They will also be offered to stop at any time and be told that they do not have to fill out any questions they do not want to. They will also be offered the option of completing them over more than one session.

Clinical risk assessment and signposting with trained professional
Risk will be assessed with participants in the initial baseline session and in the first session of the BMAC with the trainee clinical psychologist. Risk will then be continued to be monitored throughout the study. Participants will receive information and advice for any suicidal thoughts they are experiencing through this risk assessment. The trainee clinical psychologist will receive supervision from a qualified Clinical Psychologist, whilst research is taking place. Consent will be obtained from participant to share risk information with other professionals and services involved in their care, in order for risk to be managed appropriately and monitored throughout the study taking place. Consent will be obtained from participants to record both research and clinical contacts within their medical notes as per LSCFT NHS Trust guidelines. Notes will contain a brief summary of the purpose of the research taking place, with any further details of clinical risk issues and actions taken. This process has been put in place in order to ensure participant safety whilst the research is taking place.

All participants will receive six sessions of the brief Broad-Minded Affective Coping intervention over a 6 week period. Participants will not be promised benefits from the BMAC approach, as research is in the early stages so we cannot guarantee results from this approach. However, preliminary evidence has shown support for this method in helping individuals with suicidal thoughts. It is possible that participants find talking therapy challenging. The trainee clinical psychologist will be trained in making this intervention as helpful and acceptable as they can.

The trainee clinical psychologist will also monitor distress and risk throughout the intervention. This will be done through regularly reviewing risk with the participant throughout sessions via having open conversations with participants and monitoring the suicidality by using the Patient Health Questionnaire-9 as a sessional measure. Researchers involved in the study will follow risk management and safeguarding procedures at all times. Regular supervision will be provided to the trainee clinical psychologist from expert Dr. Jasper Palmier-Claus, who has previous experience in delivering the BMAC intervention for suicidality.

Risk to participants
Research has shown individuals who have psychosis and experience suicidal thoughts are at an increased risk of suicide (Yates et al., 2019). Throughout the study, researchers will follow risk protocols and safe working practices during the study. This protocol contains actions to follow if an individual has previous documented risk or if any risk is identified throughout the process of the study. If researcher has concern about imminent or significant risk, then confidentiality may be broken for patient safety. Researcher will, if possible inform participant of breaking of confidentiality and try to collaboratively involve the participant within this process. If involving participant collaboratively could increase participant risk, researcher will not include participant in this process. If high risk is present, this would entail an ambulance being called for individual or attending the local Accident and Emergency department with the individual.Throughout the study, senior management team will over see and monitor risk, this includes SAE (serious adverse events). It is important to note that research indicates that asking people about suicidal thoughts does not increase risk and can actually be a positive experience for some people (see Dazzi et al 2014; Psychological Medicine).

Risk to researchers
There is a potential risk to researchers.To mitigate this risk, risk information from other professionals (Early intervention services or CMHT/integrated care hub),or other professionals involved in patient's care will be liaised with, prior to the individual taking part in the study. The trainee clinical psychologist will adhere to trust guidance on safe working, in which the lone worker policy of LSCFT trust and Lancaster University will be followed at all times for home visits. A graded response to risk will be put in place, in line with current risk protocol. This will include breaking confidentiality and informing others where high risk is present, and in cases of imminent risk calling for an ambulance or attending the local Accident and Emergency department with the individual.The trainee clinical psychologist will receive ongoing supervision from senior staff to ensure that safe practices are being followed.

Researchers could potentially find sessions with participants to be distressing. The trainee clinical psychologist will be receiving supervision weekly in order to speak about how they are feeling throughout the process.Supervision will also ensure that safe practices are being followed within the pilot study.

Data protection and confidentiality
We outline issues around confidentiality in the participant information sheet. We will discuss confidentiality with the participant before commencing the first session and remind them of this throughout the study.

Individuals will be allocated a participant number during the study and information relating to the individual will be linked to this unique number. Identifiable information such as participants questionnaire responses and referral forms (if paper copies) will be stored in a locked filing cabinet at Lancaster University. Electronic data of participants will be stored on a secure server that is password protected.Any identifiable data on portable devices (audio recorders, etc.)will be encrypted using encryption software and deleted after transfer to a secure server. Only researchers involved in the study will be able to access this data.Participants that are taking part in the study will remain confidential, and will not be shared with anyone outside the research team.Outlined in the risk protocol is when confidentiality should be broken and this will only be broken if an individual or another person is at risk. Consent will be collected from participants at the start of the study for researchers to be able to share information with their clinical team in the interest of sharing information that could keep the participant safe.

3. PURPOSE AND DESIGN OF THE RESEARCH

A7. Select the appropriate methodology description for this research. *Please tick all that apply:*

- [ ] Case series/ case note review
- [ ] Case control
- [ ] Cohort observation
- [ ] Controlled trial without randomisation
- [ ] Cross-sectional study
- [ ] Database analysis

- [ ] Epidemiology
- [x] Feasibility/ pilot study
- [ ] Laboratory study
- [ ] Metanalysis
- [ ] Qualitative research
- [ ] Questionnaire, interview or observation study
- [ ] Randomised controlled trial
- [ ] Other (please specify)

A10. What is the principal research question/objective? *Please put this in language comprehensible to a lay person.*

1) Is the BMAC an acceptable and feasible method for individuals with psychosis and suicidal thoughts?
2) Do individuals with psychosis engage with the BMAC intervention?
3) Is it feasible to gather clinical outcome data in individuals with psychosis?
4) Will there be a change in clinical outcomes at the end of the intervention?

A11. What are the secondary research questions/objectives if applicable? *Please put this in language comprehensible to a lay person.*

N/A

A12. What is the scientific justification for the research? *Please put this in language comprehensible to a lay person.*

1. The problem
Prevalence rates for suicide in the UK and Wales are alarming (Carr et al., 2021); the suicide mortality rate in 2020 being 10.0 deaths per 100,000 people.This is the equivalent of 5,224 individuals (Office for National Statistics, 2020). Suicidality is a social and global issue (World Health Organisation, 2019) which has an impact on families' mental and physical health (Spillane et al., 2018). Researchers have advocated for the advancement of greater inclusive and cost-effective interventions,claiming current therapies have inadequate efficacy and accessibility (Simon & Ludman,2009).

Suicide accounts for a large percentage of deaths in individuals with first episode psychosis and is clearly an important health concern (Coentre et al.,2017). Freeman and colleagues(2006)found that 41% of individuals with psychosis experience suicidal ideation. Greater exploration of techniques that could help to reduce suicidality in psychosis is required (Taylor, Hutton & Wood, 2014).

2. Review of existing evidence
The Broad-Minded Affective Coping (BMAC) strategy is a cognitive behavioural technique that aims to positively affect individuals' mood through the generation of positive memories and cognitions using mental imagery (Holden et al.,2016). The BMAC aims to: target emotional regulation and stress management, help individuals improve self-efficacy and produce positive memories with emotions connected to them (Tarrier,2010).

Preliminary evidence suggests that this technique is promising in individuals with psychosis (Johnson et al 2013., Tarrier et al., 2013.,2014). Johnson et al (2013), found happiness and hope increased in just one session of the BMAC intervention in this population group. Furthermore, the BMAC intervention has also been utilised as one component of a wider cognitive behavioural intervention in the Cognitive Behavioural Suicide Prevention for Psychosis trial, in order to build upon positive schemas and reduce retrieval bias for negative memories (Tarrier & Gooding, 2009; Tarrier et al., 2013, 2014). Individuals in this trial showed improvement in two out of three outcomes of suicidal ideation (Tarrier et al., 2014). No study to date has used this individual technique as part of a brief intervention to reduce suicidal ideation in individuals with psychosis. Deconstructing cognitive behavioural approaches into their constituent parts could help to identify techniques that are most helpful and effective at reducing suicidal ideation. We have recently developed a six-session manualised version of the BMAC, which was found to be acceptable and feasible in university students (Knagg et al., 2022). This brief intervention has not yet been piloted in people with psychosis, but this would represent an important first step in the MRC cycles of developing a complex intervention. Brief interventions might provide a low-resource, easily implementable alternative to longer-term psychological therapies.

3. Why is this research important?
The BMAC strategy is a promising tool that could be used to increase well-being and limit psychological distress (Panagioti, Gooding & Tarrier 2012, Knagg et al., 2022). It is brief and can be easily incorporated into a range of

therapeutic interventions (Panagioti, Gooding & Tarrier, 2012). The NHS is currently overwhelmed, with long waiting lists and accessing help is difficult (Sokol, 2021). The BMAC strategy shows potential as a therapeutic technique that could lessen the pressure on the NHS and could potentially decrease suicide rates. Researchers have called for greater investigation into this technique for it to be widely implemented (Holden et al., 2017).

A13. Please summarise your design and methodology. *It should be clear exactly what will happen to the research participant, how many times and in what order. Please complete this section in language comprehensible to the lay person. Do not simply reproduce or refer to the protocol. Further guidance is available in the guidance notes.*

Participants can self-refer to the study or be referred by care providers (professionals at CMHT/integrated care hub or early intervention for psychosis services within LSCFT), with consent from the individual. A referral form can be completed by either care provider or the individual. It will be explained to potential participant through verbal communication as well as the participant information sheet that they are not obliged to take part in the study, and if they agree to take part, they can change their mind at any point throughout the study. It will also be explained that participation in the study will not have any effect on current treatments/or future treatments.

If potential participant expresses interest in the study, the trainee clinical psychologist will make contact with participant, typically via a phone or video call. On this call, eligibility of individual to the study will be assessed through by asking participant the following questions about suicidality 1) 'Have you had any thoughts about ending your life in the past three months', and 2) 'Have you attempted to end your life in the past three months?'
If participants confirms at least one question on suicidality (Q1&2 above) participants will be deemed eligible to take part in the study.

As well as verbally explaining the study, the trainee clinical psychologist will check whether the participant has read a copy of the participant information sheet. If not, the trainee will send a copy. Potential participant will be told that they will have at least 48 hours to decide whether they want to take part in the study. If participant is eligible to take part, the trainee clinical psychologist will arrange a face-face or remote appointment (telephone/virtual – teams appointment) in order to gather written and verbal consent (this will be recorded on a dictaphone with participant consent).

After obtaining informed consent, the trainee clinical psychologist will complete the PSYRATS (Haddock et al., 1999) and baseline assessments: The Beck Scale for suicide ideation (BSS; Beck & Steer, 1991), The Patient Health Questionnaire-9 (Kroenke et al, 2001), The Beck Hopelessness Scale BHS; (Beck et al., 1974), The Generalised Anxiety Disorder Assessment-7 (Spitzer et al., 2006) and The Perceived Control of Internal States Scale (Pallant 2000). We will also collect sociodemographic information from participants at baseline. This will include living arrangements, diagnosis, gender, age, sexuality, ethnicity and schooling. Health information will also be collected including questions about physical and mental health diagnoses, if participants are currently receiving therapy or have done in the past, current and past medication and whether participants have ever had a hospital admission.

Risk of participant will be assessed at baseline and also in the first session of the BMAC. Risk will be continued to be monitored throughout the study.

It is estimated to take up to 75 minutes for participants to complete all baseline measures. Participants will be offered multiple breaks in this time, and to complete questionnaires over multiple sessions if preferred.

After the baseline assessment has been completed,we will start the six week intervention window. The BMAC intervention (a positive mental imagery intervention)will be administered to individuals, either remotely (on teams) or Face-face. Face-face meetings will take place in mutual convenience either a room available within LSCFT, at individuals GP surgery, individuals home or current care providers service. When taking part in an online meeting, researcher will gather participants whereabouts and location, and whether there is any other individual present with them. For remote appointments (online, or teams) researcher will obtain consent from participant to be recorded through an encrypted Dictaphone(only if they feel comfortable with this),where participant will consent to each point on consent form and state there name. Online meetings will take place on Microsoft teams, Attend Anywhere or telephone. These methods are currently used for remote clinical work within LSCFT.The risk management protocol that is in place has measures for confirming participant safety during remote assessment,and sessions(e.g. finding participants location, and planning for loss in connection).
Whether online or face-face,researchers will ensure that confidentiality is upheld,and that the area is quiet and relaxed,which is important to lessen distress. The trainee clinical psychologist and other researchers will make sure to follow lone working and risk policy that has been put in place for the study. Questionnaires will be read out verbatim by the researcher for the person to respond and recorded by the researcher. The consent process and initial baseline measures are anticipated to take no longer than 75 minutes to complete,which was felt to be suitable and appropriate during consultation with the Lancaster University Public Involvement Network (LUPIN). LUPIN was a programme set up for current and former clients of clinical psychological services.

Inclusion criteria:

Aged ≥18 years.
Suicidal ideation and/or behaviours in the past three months, ascertained using the questions 'have you had any thoughts about ending your life in the past three months?' and 'have you attempted to end your life in the past three months?'. Endorsement of either item will confirm eligibility for the study and progression to full assessment. This approach is consistent with previous studies and is sensitive to detecting suicidal experiences amongst adults.

Currently under CMHT/integrated care hub or early intervention for psychosis service at the point of referral
Meeting operational criteria for an early intervention service or diagnosis of a non-affective psychotic disorder (e.g. schizophrenia, schizoaffective disorder, delusional disorder, schizophreniform disorder)

Exclusion criteria:
A diagnosis of bipolar disorder as identified by the patient
Known moderate to severe learning disability (IQ:<70)
A known diagnosis of Autism
Organic cerebral disease/injury affecting receptive and expressive language comprehension.
Organic Psychosis
Non-English speaking to the degree that the participant is unable to answer questions and give written informed consent
Lack of capacity to consent
Imminent and immediate risk to self or others, operationalised as the presence of active intent or planning to harm oneself or others in the near future (e.g. next month). Where individuals are excluded on this basis, with the person's consent, the researcher will aim to recontact them and the referrer in approximately one-months' time (or a time period agreed in collaboration with the individual) to determine if risk has subsided to a point where they are now eligible.

BMAC intervention:
All participants taking part in the study will receive six sessions of the BMAC intervention, and assessment of risk at baseline and in the first session of the BMAC. Risk will also be monitored throughout the study and include signposting when necessary.

The BMAC has been based on key theories of positive psychology as well as key theories of suicide.The BMAC exercise will entail the trainee clinical psychologist firstly introducing relaxation techniques to the participant. After, the participant will then be asked the think of a positive memory, and then be guided through this memory with engagement of the five senses (sight, touch, taste, smell and sound). After this has taken place individuals will feedback how they felt doing this exercise. Individuals will be encouraged to practice the BMAC technique in between sessions, this is with the idea that practicing this technique will help to strengthen ability in accessing alternative ways of thinking. Individuals will also be provided with materials to help to consolidate learning. These materials will contain audio-recording, information/prompt sheets,instructions and summaries of intervention. The intervention will be delivered according to client preference to allow flexibility. The intervention can either take place face-face (individual's homes, LSCFT available rooms or GP surgery),or remotely (through Microsoft teams, attend anywhere or telephone). Researchers will use text/calls to help increase engagement to the study. Researcher will have a conversation with participant whether they would like reminders before sending texts/emails and confirm how often they would like them. Researchers will communicate to participants that reminders are optional and it is their own choice whether they would like them. The trainee clinical psychologist will deliver the BMAC intervention.The research team (Dr. Jasper Palmier-Claus & Prof Bill Sellwood) have an excellent record of training, supervising, and delivering psychological interventions. In order to ensure the trainee clinical psychologist is following the BMAC model correctly and keeping to protocols within the current study there will be sessional checklists, review of practice through supervisors watching recordings of sessions, as well as weekly supervision.

Sample size: A sample size of 5-10 participants will enable investigation of the main pilot study questions regarding feasibility and acceptability.

Concomitant intervention:
Treatment as usual for individuals with Psychosis is highly variable. It may involve case management, monitoring, and signposting by a counsellor, nurse, or social worker. It may also include medication as prescribed by a GP or Psychiatrist. Some individuals may receive another talking therapy or counselling from a psychologist or psychological therapist. Other therapies and medication will not be withheld in the study but will be carefully monitored throughout.

Feasibility outcomes
I)We will record pertinent information on participant flow,including the numbers of referrals, consents, and withdrawals. Feasibility outcomes are as follows: i) attendance to sessions ii) rates of recruitment iii) completion of tasks allocated to participants outside of sessions iv) attrition at follow up and post treatment (12 weeks) v) the amount of clinical outcome data missing. Researcher will also record session attendance,reasons for individuals not attending,and information on the amount of assessment and intervention sessions completed.

Outcome measures:

The trainee clinical psychologist will assess clinical outcomes face-to-face or remotely at baseline, post intervention(after 6 weeks) and at 12 weeks for follow up. This length of follow-up will allow assessment of medium-term outcomes and is consistent with the evaluation of effects for other brief interventions. We have clear risk management protocols for remote assessment to ensure patient safety. There is evidence that assessing suicidal experiences does not elevate risk.

Clinical outcomes:
The assessment battery will assess clinical variables associated with suicide and psychosis. We will record the following self-report outcomes:

The PSYRATS (Haddock et al, 1999) will be used to measure dimensions of auditory hallucinations and delusions in participants at baseline.

The Patient Health Questionnaire-9 (PHQ-9; Kroenke et al., 2001). This measure will be used to determine the severity of depression in an individual. This measure will be used as a sessional measure.

The Beck Scale for suicidal ideation (BSS; Beck & Steer, 1991) will be used to measure suicidal ideation. This will be assessed at baseline, after 6 weeks and 12 weeks.

The Beck Hopelessness Scale (BHS; Beck et al, 1974) will be used to measure three major aspects of hopelessness: feelings about the future, loss of motivation and expectations. This will be assessed at baseline, after 6 weeks and 12 weeks.

The Generalised Anxiety Disorder assessment-7 (GAD; Spitzer et al, 2006) will be used to measure or assess the severity of generalised anxiety disorder (GAD). This will be assessed at baseline, after 6 weeks and 12 weeks.

The Perceived control of internal states scale (Pallant, 2000), will be used to measure the degree to which people feel they have control of their internal states (emotions, thoughts, physical reactions). This will be assessed at baseline, after 6 weeks and 12 weeks.

To determine acceptability & feasibility:

An open debrief with participants

The Client Satisfaction Questionnaire will be used to measure satisfaction with the intervention (CSQ-3; Larson et al.,1979). It is a widely acknowledged measure that demonstrates high internal consistency with a Cronbach alpha of 0.91 (Attkisson & Zwick,1982). This will be administered once at the end of the pilot study.

The Acceptability of Intervention Measure (Weiner et al., 2017),will be used to determine if participants feel the interve

A14-1. In which aspects of the research process have you actively involved, or will you involve, patients, service users, and/or their carers, or members of the public?

- [x] Design of the research
- [ ] Management of the research
- [x] Undertaking the research
- [ ] Analysis of results
- [x] Dissemination of findings
- [ ] None of the above

Give details of involvement, or if none please justify the absence of involvement.
Design of the research - service users have been consulted from LUPIN (Lancaster, University Public Involvement Network).
Undertaking the research - Service users from CMHT/Integrated care hub/Early intervention services for psychosis will be approached to take part in the study.
Dissemination of findings - Findings will be disseminated to all service users that have taken part in the study as well as members of the public. We plan to publish this research.

4. RISKS AND ETHICAL ISSUES

RESEARCH PARTICIPANTS

A15. What is the sample group or cohort to be studied in this research?

Select all that apply:

- [ ] Blood
- [ ] Cancer
- [ ] Cardiovascular
- [ ] Congenital Disorders
- [ ] Dementias and Neurodegenerative Diseases
- [ ] Diabetes
- [ ] Ear
- [ ] Eye
- [ ] Generic Health Relevance
- [ ] Infection
- [ ] Inflammatory and Immune System
- [ ] Injuries and Accidents
- [x] Mental Health
- [ ] Metabolic and Endocrine
- [ ] Musculoskeletal
- [ ] Neurological
- [ ] Oral and Gastrointestinal
- [ ] Paediatrics
- [ ] Renal and Urogenital
- [ ] Reproductive Health and Childbirth
- [ ] Respiratory
- [ ] Skin
- [ ] Stroke

Gender:	Male and female participants
Lower age limit: 18	Years
Upper age limit:	Years

A17-1. Please list the principal inclusion criteria (list the most important, max 5000 characters).

Inclusion criteria:
Aged ≥18 years.

Suicidal ideation and/or behaviours in the past three months, ascertained using the questions 'have you had any thoughts about ending your life in the past three months?' and 'have you attempted to end your life in the past three months?'. Endorsement of either item will confirm eligibility for the study and progression to full assessment. This approach is consistent with previous studies and is sensitive to detecting suicidal experiences amongst adults.

Currently under the care of CMHT/integrated care hub or early intervention for psychosis service at the point of referral

Meeting operational criteria for an early intervention service or diagnosis of a non-affective psychotic disorder (e.g. schizophrenia, schizoaffective disorder, delusional disorder, schizophreniform disorder).

A17-2. Please list the principal exclusion criteria (list the most important, max 5000 characters).

Exclusion criteria:
A diagnosis of bipolar disorder as identified by the patient
Known moderate to severe learning disability (IQ:<70)
A known diagnosis of Autism
Organic cerebral disease/injury affecting receptive and expressive language comprehension.
Organic Psychosis
Non-English speaking to the degree that the participant is unable to answer questions and give written informed consent.
Lack of capacity to consent
Imminent and immediate risk to self or others, operationalised as the presence of active intent or planning to harm oneself or others in the near future (e.g., next month). Where individuals are excluded on this basis, with the person's consent, the researcher will aim to recontact them and the referrer in approximately one-months' time (or a time period agreed in collaboration with the individual) to determine if risk has subsided to a point where they are now eligible.

RESEARCH PROCEDURES, RISKS AND BENEFITS

A18. Give details of all non-clinical intervention(s) or procedure(s) that will be received by participants as part of the research protocol. *These include seeking consent, interviews, non-clinical observations and use of questionnaires.*

Please complete the columns for each intervention/procedure as follows:

1. Total number of interventions/procedures to be received by each participant as part of the research protocol.
2. If this intervention/procedure would be routinely given to participants as part of their care outside the research, how many of the total would be routine?
3. Average time taken per intervention/procedure (minutes, hours or days)
4. Details of who will conduct the intervention/procedure, and where it will take place.

Intervention or procedure	1	2	3	4
Consent taking	1	0	5	Trainee Clinical Psychologist; face-to-face at place of mutual convenience or remote (telephone/online)
Sociodemographic & health information	1	0	5	Trainee Clinical Psychologist; face-to-face at place of mutual convenience or remote (telephone/online)
Beck Scale for Suicidal Ideation	3	0	5	Trainee Clinical Psychologist; face-to-face at place of mutual convenience or remote (telephone/online)
Patient Health Questionnaire 9	9	0	5	Trainee Clinical Psychologist; face-to-face at place of mutual convenience or remote (telephone/online)
Beck Hopelessness Scale	3	0	5	Trainee Clinical Psychologist; face-to-face at place of mutual convenience or remote (telephone/online)
Generalised Anxiety Scale 7	3	0	5	Trainee Clinical Psychologist; face-to-face at place of mutual convenience or remote (telephone/online)
Perceived Control of Internal States Scale	3	0	5	Trainee Clinical Psychologist; face-to-face at place of mutual convenience or remote (telephone/online)
Follow-up Sociodemographic sheet.	1	0	5	Trainee Clinical Psychologist; face-to-face at place of mutual convenience or remote (telephone/online)
The Client satisfaction questionnaire	1	0	5	Trainee Clinical Psychologist; face-to-face at place of mutual convenience or remote (telephone/online)
The Acceptability of Intervention Measure	1	0	5	Trainee Clinical Psychologist; face-to-face at place of mutual convenience or remote (telephone/online)
Debrief	3	0	5	Trainee Clinical Psychologist; face-to-face at place of mutual convenience or remote (telephone/online)

The Psychotic Symptom Rating Scales (PSYRATS)	1	0	20	Trainee Clinical Psychologist; face-to-face at place of mutual convenience or remote (telephone/online)
Suicide Attempt-Self-Injury Interview	9	0	5	Trainee Clinical Psychologist; face-to-face at place of mutual convenience or remote (telephone/online)

A19. Give details of any clinical intervention(s) or procedure(s) to be received by participants as part of the research protocol. *These include uses of medicinal products or devices, other medical treatments or assessments, mental health interventions, imaging investigations and taking samples of human biological material. Include procedures which might be received as routine clinical care outside of the research.*

Please complete the columns for each intervention/procedure as follows:

1. Total number of interventions/procedures to be received by each participant as part of the research protocol.
2. If this intervention/procedure would be routinely given to participants as part of their care outside the research, how many of the total would be routine?
3. Average time taken per intervention/procedure (minutes, hours or days).
4. Details of who will conduct the intervention/procedure, and where it will take place.

Intervention or procedure	1	2	3	4
Broad Minded Affective Coping (BMAC) intervention	6	0	60	Trainee Clinical Psychologist; face-to-face at place of mutual convenience or remote (telephone/online)
Risk assessment (taking place within assessment measures and first session of the BMAC). Risk will continued to be monitored throughout the study.	1	0	15	Trainee Clinical Psychologist; face-to-face at place of mutual convenience or remote (telephone/online)

A20. Will you withhold an intervention or procedure, which would normally be considered a part of routine care?

○ Yes ◉ No

A21. How long do you expect each participant to be in the study in total?

For a total of 12 weeks.

Participants will firstly complete assessment baseline measures and risk will be assessed (week 1).Then participants will complete 6 sessions of the BMAC over 6 weeks. After 6 weeks participants will complete post assessment measures.At 12 weeks,participants will have a follow up to complete baseline measures again.

A22. What are the potential risks and burdens for research participants and how will you minimise them?

For all studies, describe any potential adverse effects, pain, discomfort, distress, intrusion, inconvenience or changes to lifestyle. Only describe risks or burdens that could occur as a result of participation in the research. Say what steps would be taken to minimise risks and burdens as far as possible.

1.Distress during sessions.
The assessments (e.g. questionnaires, interviews) ask sensitive questions. It is possible that participants will experience some emotional discomfort or distress whilst relaying this information. We have developed a risk management protocol with clinicians and people with lived experiences. We will minimise the potential impact using the following strategies:

We will inform participants that they may discontinue participating in the research at any time (e.g. in the participant information sheet). They can also continue being involved in the study, but decline to fill in particular items, questionnaires or measures or miss assessments at particular time-points.

The trainee clinical psychologist will be trained in clinical interviewing skills in order to create a warm, non-judgemental, and receptive consultation climate.

Assessments will be conducted in non-threatening and confidential environments, including people's own homes, counselling services, rooms available within LSCFT,GP surgeries etc or remotely via telephone or the video calls.

The trainee clinical psychologist will be provided with regular supervision to ensure that they sensitively and appropriately deal with any distress arising during sessions. The trainee clinical psychologist has experience of working with individuals experiencing suicidal thoughts and managing distress.

All assessment and intervention sessions will include a reflective debriefing to allow space for participants to air their views on the session.

If participants express the desire to receive further support, we will provide details of where support can be accessed including current healthcare providers and other support agencies.

Where participants present with distress, we will offer a follow-up telephone call within 24 hours by the research team to check on the participant's wellbeing and provide further signposting to helpful resources if necessary.

2. Burden on participants
Participants may perceive the collection of the assessment measures as burdensome. We estimate that the assessments should take no longer than 75 minutes per time-point (probably less).We will minimise potential negative impact by:

Providing participants with clear, detailed information in written and verbal formats outlining the exact requirements of participation before they provide consent to participate.

Informing participants that they may discontinue participating in the research at any time without it affecting their standard of care or service provision.

Offering regular breaks or the option to break down questionnaires and interviews into multiple parts. We will inform participants that, if they wish, they can take a break or continue the self-report measures/interviews on a different day. If the participant expresses this wish, the researcher will stop the interview immediately until the participant feels able to continue.

We will explicitly state that participation is voluntary and their decision will not affect their relationship with any care providers or services in the participant information sheet.

3. The BMAC intervention
The BMAC intervention aims to reduce perseverative suicidal thinking by strengthening alternative positive memories and images. Previous study by Knagg et al (2022) observed no adverse reactions to the intervention in a pilot study of 11 students. Generally, students found the intervention to be acceptable and helpful. Researchers found that general levels of suicidal thinking reduced after the BMAC intervention. In order to ensure that the intervention does not increase distress or risk:

The trainee clinical psychologist has received training to deliver the BMAC intervention to ensure that they respond appropriately and empathically to any distress and manage any emerging risk. All individuals will receive a risk assessment and signposting before the study, to ensure that clinicians have a good understanding of presenting risk issues before delivering the intervention. Risk will be monitored throughout the study.

The trainee clinical psychologist will receive regular supervision throughout the pilot study to ensure that they effectively and appropriately support participants during the intervention. Participants will be encouraged to work at their own pace. They will be informed that they can discontinue the intervention at any time.

We will monitor and review serious adverse events and serious adverse reactions throughout the study to ensure that the intervention does not elevate risk. Supervisors of the study will oversee serious adverse events across the intervention, as well as SAEs being independently monitored by a professional at Lancaster University. We will consider discontinuation of the pilot study if the intervention or procedures were concluded to elevate risk.

Adverse Events
All adverse events (AEs) will be assessed by the research team and supervisors of the study for seriousness and whether or not the AEs are related to the current therapy intervention. AEs will also be independently reviewed. AEs can be defined as 'Any untoward medical occurrence or psychological occurrence in a participant to whom psychological therapy/assessment has been administered which does not necessarily have a causal relationship with the intervention. An adverse event can therefore be any unfavourable and unintended sign, symptom, or disease in any participant whether or not considered related to the psychological therapy/assessment.'

Serious Adverse Events

As the target population for the study is individuals with psychosis who have suicidal ideation, we expect that there may be some SAEs relating to life- threatening behaviour (i.e. suicide attempts or self-harm). SAEs can be defined as any occurrences that; result in death, is life threatening, requires hospitalisation or prolongation of existing hospitalisation, results in persistent or significant disability, may have caused a birth defect or requires intervention to prevent permanent impairment or damage. Other 'important medical events' may also be considered serious if an intervention is required to prevent one of the above consequences. Examples of SAEs include: i) Incidents of self-harm which have been associated with an A&E admission; ii) Increase in the severity or frequency of symptoms that results in a visit to A&E when an outpatient; and iii) deterioration in mental health resulting in hospitalisation.
If any SAEs occur within the study, all researchers have duty of care to follow risk protocol and report events immediately to research supervisors and sponsor.

All adverse events related to the psychological therapy that occur between baseline and the end of an individual's participation in the study will be recorded in their participation notes, and the study AE / SAE log kept by research supervisors. We will also complete a DATIX for SAEs in line with LSCFT Trust Policy.

Research will be required to report any SAEs immediately and within 24 hours using a set reporting template, which will be shared with the sponsor. SAEs will be independently reviewed. The principal investigator will notify the sponsor and REC of any SAEs within 15 days as per HRA guidance.

The research supervisors and professional at Lancaster University independent from the study will also review all SAEs to assess whether they are likely to be the result of any aspect of the study's procedures or intervention. In cases of immediate and obvious concerns about participants' health or safety, the research supervisors may employ urgent safety measures to discontinue the study if the intervention or procedures are deemed to elevate participant's risk. If the study is stopped, the research supervisors will notify the research ethics committee (REC) of this decision immediately over the telephone and within three days in writing (as per HRA guidelines).

SAEs will be monitored carefully and recorded throughout the study by asking participant questions: i)'since the last assessment, have you experienced any life-threatening events or near death experiences?' and ii)'since the last assessment, has anything happened that has caused you persistent or significant disability or incapacity?'. SAEs will be identified through suicide attempt assessments, serious adverse events in participants clinical notes, or discussions with research and clinical staff.

Events that are not considered to be a result of the intervention will be classified as SAEs. If serious events are considered due to intervention, they will be reported as serious adverse reactions (SARs). A risk protocol has been developed for the study, and will be followed at all times.

4. Risk of harm
The study will recruit individuals who have psychotic symptoms and are experiencing suicidal thoughts. Therefore, these individuals are thought to be at elevated risk of suicide and are sometimes more vulnerable than the general population. Important to note is that research suggests that talking about suicidal experiences does not increase risk and can actually be a positive experience for some people (see Dazzi et al 2014; Psychological Medicine). The research team will manage and minimise risk throughout the study using the following strategies:

We will collect key risk information from the participants care team as part of the referral process. This will ensure that we identify and manage any risks from the outset of the project.

We will gather informed consent to share relevant information with the participants nominated professional and service (e.g., CMHT/integrated care hub, Early Intervention services for individuals with psychosis) as part of the consent process. We will also gather the participant's consent to record both research and clinical contacts in their medical notes as per LSCFT NHS Trust guidelines. This will include a brief description of why the research procedure took place and details of any clinical risk issues that arose, and actions taken. Information sharing will help to ensure that participants are kept safe throughout the research, and that opportunities for protecting individuals taking part in the study are not missed. This would include correspondence with the nominated professional outlining any changes in risk or updated risk assessments.

Participants will be informed that information provided in the self-report measures and discussions in any interviews will remain confidential to other agencies, unless any information is disclosed that indicates a risk to the participant and/or others. This will be explicitly stated in the PIS and discussions prior to administering the self-report measures/interviews. If imminent risk is identified, we would collaboratively work with the participant to manage and share this risk with outside agencies (e.g. police, A&E and social care). In all instances we would inform participants of confidentiality breaks unless it was unsafe to do so. If the trainee clinical psychologist has any doubts about risk disclosure, advice will be sought from senior clinicians on the team Dr Jasper Palmier-Claus & Dr Bill Sellwood). Please see the attached risk management protocol for further guidance for research team when working on this pilot study.

We will follow Lancaster University and Trust Lone Worker Policy, which stipulate in detail the measures that must be undertaken to minimise any risk to self and others when conducting home visits. This includes liaising with colleagues to let them know of the workers whereabouts and exactly when the visit is starting and has ended. If the research professional feels uncomfortable for any reason about visiting a participant alone, it will be arranged for another member of the team to accompany that person during the visit, with permission from the participant.

At the end of each visit, a clinical note will be completed which includes any risk issues encountered during the visit/therapy session. Any risk issues will be noted, stored in the participant's research notes, and shared with the research team for reasons of safety and where necessary the participant's nominated contact(s) will be informed. If necessary, any interventions or actions will be discussed firstly with a clinically qualified senior team member (e.g. Dr Jasper Palmier-Claus or Prof Bill Sellwood).

It is also possible that the researcher may experience distress/discomfort after listening to clients, due to emotional content. Therefore, regular supervision will be put in place for researchers to utilise and discuss any concerns.

A23. Will interviews/ questionnaires or group discussions include topics that might be sensitive, embarrassing or upsetting, or is it possible that criminal or other disclosures requiring action could occur during the study?

(●) Yes ( ) No

If Yes, please give details of procedures in place to deal with these issues:

It is possible that some of the topics covered in the assessments and the intervention sessions are upsetting. Any distress will be handled with care by the researcher/professional delivering the intervention. The following protocol will be adopted:The use of clinical interviewing skills to create a warm, non-judgmental, and receptive environment.
Any face-to-face assessments and intervention sessions will be conducted in a non-threatening environment.
We will ensure that participants are in non-threatening and relaxed environments prior to conducting any remote assessment or intervention sessions.
The trainee clinical psychologist delivering the intervention is fully trained in risk management and distress protocols.
The trainee clinical psychologist will have access to regular supervision.
All intervention and assessment sessions will provide the space for reflection and feedback.
Participants will be informed that they may discontinue participating in the research at any time.This will be made clear in the participant information sheet. Participants will be reminded that they can take a break at any point and/or ask to pass over
questions they do not wish to answer.

The researcher will liaise with the participant's nominated contact(s) if the participant is felt to be at risk to themselves or others at any time. Participants will be made aware of this in the PIS. It is possible that,in cases of imminent risk, the research team need to share information with other agencies or services(e.g. police, ambulance service). In the event of imminent risk, any breaks in confidentiality will follow the guidelines of the British Psychological Society (Code of Ethics and Conduct, March 2006). Specifically:"Restrict breaches of confidentiality to those exceptional circumstances under which there appears sufficient evidence to raise serious concern about: (a)the safety of clients;(b)the safety of other persons who may be endangered by the client's behaviour; or(c)the health, welfare or safety of children or vulnerable adults."At these times, the researcher or professional will"Consult a professional colleague when contemplating a breach of confidentiality, unless the delay occasioned by seeking such a consultation is rendered impractical by the immediacy of the need for disclosure". In light of the above, participants will be informed about the limits of confidentiality.It will be clearly stated in the information statement and verbally explained prior to providing informed consent. As part of the consent procedure, clients will be asked to indicate that they understand the limits of confidentiality. For all confidentiality breaches, we will inform participants what information will be shared, for what purpose and with who, unless doing so would elevate risk.

A24. What is the potential for benefit to research participants?

All eligible participants will receive an assessment of risk when firstly completing baseline measures and in the first session of the BMAC. Risk will be continued to be monitored throughout the study. All participants will also receive a brief psychological intervention (6 sessions of the BMAC) aimed at promoting positive emotions and reducing suicidal thinking.Although the effectiveness of this intervention is currently unknown, preliminary data suggests that the intervention is acceptable and may be helpful to individuals with psychosis experiencing suicidal thoughts. Participants may also find taking part in a research study a positive experience.

A25. What arrangements are being made for continued provision of the intervention for participants, if appropriate, once the research has finished? *May apply to any clinical intervention, including a drug, medical device, mental health*

intervention, complementary therapy, physiotherapy, dietary manipulation, lifestyle change, etc.

Given that the effectiveness of the BMAC intervention is currently unknown, we will not be making it available to participants after the study is completed. They are, however, welcome to seek other support and treatment for their suicidal thoughts. Should a later definitive trial demonstrate the effectiveness of the intervention, we will make it freely available to all NHS services.

A26. What are the potential risks for the researchers themselves? *(if any)*

The trainee clinical psychologist may be at risk when visiting participants in their own home or in other settings. Staff will adhere to LSCFT and Lancaster University lone worker policy regarding risk. The lone worker policy involves identifying potential risk prior to an initial visit. In some instances, if risks to the researcher are identified or are unclear, the staff member will request that another team member to accompany them and/or arrange to see the person in a formal care setting (e.g. counselling service or GP surgery) as opposed to their own home. Prior to each participants visit that takes place at a participant's home, regardless of risk issues, the trainee clinical psychologist will ensure that their whereabouts is known to the study team and that they call in before and after the visit. Staff will only use an office phone or a study mobile phone (not personal numbers). It is possible that participants may disclose upsetting or distressing information. If the trainee clinical psychologist experiences any distress from the information disclosed, this will be discussed in supervision with a senior clinician.

RECRUITMENT AND INFORMED CONSENT

In this section we ask you to describe the recruitment procedures for the study. Please give separate details for different study groups where appropriate.

A27-1. How will potential participants, records or samples be identified? Who will carry this out and what resources will be used?*For example, identification may involve a disease register, computerised search of GP records, or review of medical records. Indicate whether this will be done by the direct healthcare team or by researchers acting under arrangements with the responsible care organisation(s).*

5-10 participants will be identified by and recruited through responsible professionals (e.g. counsellors, psychologists, nurses, social workers, therapists, occupational therapists, psychiatrists, support workers) at NHS CMHT/integrated care hub teams and Early Intervention for psychosis teams within LSCFT. Recruiting services will receive advice and guidance from the trainee clinical psychologist and research term on the eligibility criteria with which to make appropriate referral. The research team have strong pre-existing working links with CMHT/integrated care hub and Early Intervention services (Dr. Palmier-Claus & Prof. Bill Sellwood).

The trainee clinical psychologist will approach potential participants about the study and share a participant information sheet (PIS). If the potential participant consents, they will then complete a referral form with the person's details and any immediate risk information. The trainee clinical psychologist will then contact the participant to answer any questions, discuss the study, and arrange a time to meet face-to-face or online to complete informed consent procedures and complete the baseline assessments. Participants will be given at least 48 hours in which to consider the study before taking part. They will be informed that they can end their participation in the study at any time without it affecting the standard of care they receive through their service.

We will also accept self-referrals to the study. We will advertise the research using posters which will be displayed in CMHT/integrated care hubs and early intervention for psychosis services. Participants can contact the research team to obtain more information and receive a participant information sheet. Participants will be asked to provide the details of any services or support that they are currently receiving, including GP contact details. We will ask for consent to contact a responsible professional to ensure that there are no immediate risks prior to an initial meeting. If the participant is happy to participate and it is safe to do so, the trainee clinical psychologist will then arrange an initial appointment where they will gather written or audio informed consent and complete the baseline assessments. Again, participants will always be given 48 hours in which to consider whether or not to participate.

A27-2. Will the identification of potential participants involve reviewing or screening the identifiable personal information of patients, service users or any other person?

(●) Yes ( ) No

Please give details below:
Potential participants will be initially identified and approached by a member of the CMHT/integrated care hub or early

intervention service for psychosis who will typically be the first point of contact about the study. Participants will also be able to self-refer into the study after seeing promotional material (poster). After individuals have expressed interest in the study to their care provider, and given consent to be contacted, the trainee clinical psychologist will then contact individuals.

A27-3. Describe what measures will be taken to ensure there is no breach of any duty of confidentiality owed to patients, service users or any other person in the process of identifying potential participants. *Indicate what steps have been or will be taken to inform patients and service users of the potential use of their records for this purpose. Describe the arrangements to ensure that the wishes of patients and service users regarding access to their records are respected. Please consult the guidance notes on this topic.*

Only direct care teams of the individuals will screen PID. The researcher will then approach individuals after screening and identification has been done by a member of the direct care team.

A27-4. Will researchers or individuals other than the direct care team have access to identifiable personal information of any potential participants?

○ Yes ◉ No

A28. Will any participants be recruited by publicity through posters, leaflets, adverts or websites?

◉ Yes ○ No

If Yes, please give details of how and where publicity will be conducted, and enclose copy of all advertising material (with version numbers and dates).

A poster will be distributed across CMHT and Early intervention for psychosis/integrated care hub NHS teams.

A29. How and by whom will potential participants first be approached?

In most instances, potential participants will first be approached by the trainee clinical psychologist or CMHT/Early Intervention/integrated care hub NHS member. They will provide participants with a participant information sheet (PIS), discuss the study, and ask whether they are interested in taking part in the study. If the potential participant agrees, the professional/CMHT/integrated care hub/Early intervention employee or the participant can then complete a referral form to the study. We will also accept self-referrals into the pilot study. Individuals may be told by their clinical team about the study and are allowed to self-refer, they may also see promotional material (the poster).

A30-1. Will you obtain informed consent from or on behalf of research participants?

◉ Yes ○ No

If you will be obtaining consent from adult participants, please give details of who will take consent and how it will be done, with details of any steps to provide information (a written information sheet, videos, or interactive material). Arrangements for adults unable to consent for themselves should be described separately in Part B Section 6, and for children in Part B Section 7.

If you plan to seek informed consent from vulnerable groups, say how you will ensure that consent is voluntary and fully informed.

All potential participants will have received a written copy of the participant information sheet either through the post, email or in person. Before attending an initial appointment to confirm eligibility, all potential participants will have multiple opportunities to ask questions and have these addressed (by phone, email or in person). The trainee clinical psychologist will ensure that the participant is fully briefed and aware of what participating involves.

If you are not obtaining consent, please explain why not.

Please enclose a copy of the information sheet(s) and consent form(s).

A30-2. Will you record informed consent (or advice from consultees) in writing?

◉ Yes ○ No

A31. How long will you allow potential participants to decide whether or not to take part?

Participants will be given at least 48 hours to decide if they would like to take part in the study, but may take longer if needed. Upon referral to the project (including self-referral), potential participants will speak with the trainee clinical psychologist. The potential participant will have the study explained to them in full and will be given the opportunity to ask any questions regarding participation. Written information about the study will be offered and sent to the potential participant(if not already provided by a member of the care team or not retained by the participant). The participant will later meet with the trainee clinical psychologist face-to-face or remotely to provide written or audio recorded informed consent and complete baseline assessments, but will always have been given at least 48 hours to consider their participation.

A32. Will you recruit any participants who are involved in current research or have recently been involved in any research prior to recruitment?

◉ Yes
○ No
○ Not Known

If Yes, please give details and justify their inclusion. If Not Known, what steps will you take to find out?

We will not exclude participants based on their involvement in another research project. Participants will be informed of what participating in this study will involve so they can make an informed decision of whether they have time to take part in more than one research study.

A33-1. What arrangements have been made for persons who might not adequately understand verbal explanations or written information given in English, or who have special communication needs?*(e.g. translation, use of interpreters)*

Unfortunately, the assessments require a proficiency in the English language. Furthermore, some of the assessments/measures used have not been validated in other languages.For this reason, we have made this part of our exclusion criteria.

A34. What arrangements will you make to ensure participants receive any information that becomes available during the course of the research that may be relevant to their continued participation?

Letters and emails will be sent to participants over the course of the research (with participants consent). Should we need to discontinue or stop the study due to safety reasons, we would write to participants and their responsible clinicians to let them know.

A35. What steps would you take if a participant, who has given informed consent, loses capacity to consent during the study? *Tick one option only.*

○ The participant and all identifiable data or tissue collected would be withdrawn from the study. Data or tissue which is not identifiable to the research team may be retained.

◉ The participant would be withdrawn from the study. Identifiable data or tissue already collected with consent would be retained and used in the study. No further data or tissue would be collected or any other research procedures carried out on or in relation to the participant.

○ The participant would continue to be included in the study.

○ Not applicable – informed consent will not be sought from any participants in this research.

○ Not applicable – it is not practicable for the research team to monitor capacity and continued capacity will be assumed.

Further details:

The participant's information up until the point of loss of capacity to consent would be retained and used in the study, this is due to immediate anonymisation of data. This will be explained to the participant in the PIS and consent form.

If you plan to retain and make further use of identifiable data/tissue following loss of capacity, you should inform participants about this when seeking their consent initially.

CONFIDENTIALITY

In this section, personal data means any data relating to a participant who could potentially be identified. It includes pseudonymised data capable of being linked to a participant through a unique code number.

Storage and use of personal data during the study

A36. Will you be undertaking any of the following activities at any stage (including in the identification of potential participants)? *(Tick as appropriate)*

- [x] Access to medical records by those outside the direct healthcare team
- [ ] Access to social care records by those outside the direct social care team
- [x] Electronic transfer by magnetic or optical media, email or computer networks
- [ ] Sharing of personal data with other organisations
- [ ] Export of personal data outside the EEA
- [x] Use of personal addresses, postcodes, faxes, emails or telephone numbers
- [ ] Publication of direct quotations from respondents
- [ ] Publication of data that might allow identification of individuals
- [x] Use of audio/visual recording devices
- [x] Storage of personal data on any of the following:
  - [x] Manual files (includes paper or film)
  - [x] NHS computers
  - [ ] Social Care Service computers
  - [ ] Home or other personal computers
  - [x] University computers
  - [ ] Private company computers
  - [x] Laptop computers

Further details:
Emails may be used to contact potential participants with information about the research and to answer any questions about the study.Depending on participant preference, emails may also be used to book and/or reschedule appointments for completion of the self-report measures.During the study, contact details (address, email, telephone and/or mobile phone numbers) will be used to contact the individual about the study (e.g. provide study information, answer any queries, appointment booking/reminders). Contact details will be stored securely in a locked filing cabinet or on password protected computer files and kept separately from the research data obtained.
Data collected during the study will be stored on password protected NHS LSCFT laptop in a secure drive and in a locked filing cabinet in Lancaster University premises. Consent forms will be stored in a separate locked filing cabinets to the data in Lancaster University premises. In cases where audio recorded consent takes place, we will record this using encrypted dictaphones and transfer these audio files on a secure NHS computer/drive at the next available opportunity.

All data will be anonymised and only identified using the unique participant identifier. The study database will be anonymised and encrypted and stored at Lancaster University.

A37. Please describe the physical security arrangements for storage of personal data during the study?

Personal data (e.g. name, contact details) will be separated from the research data in a locked filing cabinet on

Lancaster University premises. Consent forms will also be stored in a separate locked filing cabinet on Lancaster University premises. Only individuals from Lancaster University, regulatory authorities, and Lancashire and South Cumbria NHS Foundation Trust will have access to personal data. All personal information will be given an anonymous code and codes will be used to identify completed self-report measures and audio recordings. Audio recordings of consent and sessions will be stored on password protected NHS computers. Personal data on portable devices (e.g. audio recorders) will be encrypted using encryption software and deleted as soon as it is uploaded onto a secure server. Access to personal data will be restricted to members of the specified research team.

A38. How will you ensure the confidentiality of personal data? *Please provide a general statement of the policy and procedures for ensuring confidentiality, e.g. anonymisation or pseudonymisation of data.*

Each participant will be assigned a participant identity code number, allocated at entry to the study, for use on pilot study documents and all information stored on the electronic database. The research team will make a separate confidential record of the participant's name, address, date of birth, and participant number, to permit identification of all participants enrolled in the study, for the purposes of additional follow-up. This record will be securely stored (password protected) on a secure server at Lancaster University separate to research data. All other information will be anonymised and will always be stored separately to information containing personal details. All hard copy data relating to participants will be stored in locked filing cabinets. Identifiable data on portable devices (e.g. audio recorders, etc.) will be encrypted using encryption software and deleted after being uploaded to a secure server. Access to personal data will be restricted to members of the research team. We have allowed for assessments and intervention sessions to be conducted remotely via secure videoconferencing software (e.g. Teams) or the telephone in line with NHS guidance. The COVID-19 pandemic has meant that the NHS has moved increasingly towards remote assessment, consultation, and therapy. This provides people with the option of avoiding face-to-face contact (reducing the possibility of COVID transmission) and promotes patient choice. We will only use secure video conferencing software approved by Lancashire and South Cumbria NHS Foundation Trust: remote consultation (e.g. Microsoft Teams) or Attend Anywhere. Microsoft Teams and Attend Anywhere is secure and informal governance compliant. We will follow LSCFT protocols to ensure that remote consultation is conducted safely and confidentially. This includes establishing the participant's whereabouts, identifying who else is present, and creating a plan for loss of internet connection. The BMAC intervention has been designed to allow for remote delivery.

A40. Who will have access to participants' personal data during the study? *Where access is by individuals outside the direct care team, please justify and say whether consent will be sought.*

Only the direct research team will have access to personal data. Study material and data may be accessed by individuals from Lancaster University, Lancashire and South Cumbria NHS Foundation Trust or regulatory authorities for auditing and monitoring purposes.

Storage and use of data after the end of the study

A41. Where will the data generated by the study be analysed and by whom?

Anonymised data will be managed and stored in accordance with Lancashire and South Cumbria NHS Foundation Trust and Lancaster University data management policies. Individuals' data will not be used for any other purpose than that stipulated in the PIS and consent form. Participants will be assigned a unique study number and will only be identified from this number. Quantitative data will be analysed by the clinical trainee psychologist Claudia Daley at Lancaster University and will be supervised by Dr. Jasper Palmier Claus and Prof. Bill Sellwood. Audio recordings will be destroyed at the end of the study.

A42. Who will have control of and act as the custodian for the data generated by the study?

	Title	Forename/Initials	Surname
	Professor	Bill	Sellwood
Post	Programme Director		
Qualifications	PhD - 2001 Clinical Psychology - University of Manchester MSc – 1989 - Clinical Psychology University of Manchester - Qualification as a clinical psychologist BSc – 1987 - Psychology (2i) - University of Manchester		
Work Address	Health Innovation Campus		

Lancaster University
Lancaster
Post Code LA14YW
Work Email b.sellwood@lancaster.ac.uk
Work Telephone 01524663086
Fax

A43. How long will personal data be stored or accessed after the study has ended?

- ○ Less than 3 months
- ○ 3 – 6 months
- ○ 6 – 12 months
- ○ 12 months – 3 years
- ◉ Over 3 years

If longer than 12 months, please justify:
All personal data and audio recordings will be destroyed when no longer required (other than consent forms for audit and governance by regulatory authorities and contact details for those who wish to be contacted about the findings). The storage of research data, will comply with Lancaster University's policy of storing data - to be retained for 10 years.

A44. For how long will you store research data generated by the study?

Years: 10
Months: 0

A45. Please give details of the long term arrangements for storage of research data after the study has ended. *Say where data will be stored, who will have access and the arrangements to ensure security.*

The storage of research data will comply with LSCFT and Lancaster University's policy of storing data. It will be retained for 10 years after study completion and publication in an external archiving facility. At the end of the retention period, paper will be destroyed using paper shredders. Electronic data will be deleted.

INCENTIVES AND PAYMENTS

A46. Will research participants receive any payments, reimbursement of expenses or any other benefits or incentives for taking part in this research?

◉ Yes ○ No

If Yes, please give details. For monetary payments, indicate how much and on what basis this has been determined.
Participants will receive a £10 voucher as reimbursement for each of the research assessments at 6 weeks and 12 week follow up.

A47. Will individual researchers receive any personal payment over and above normal salary, or any other benefits or incentives, for taking part in this research?

○ Yes ◉ No

A48. Does the Chief Investigator or any other investigator/collaborator have any direct personal involvement (e.g.

financial, share holding, personal relationship etc.) in the organisations sponsoring or funding the research that may give rise to a possible conflict of interest?

◯ Yes ◉ No

NOTIFICATION OF OTHER PROFESSIONALS

A49-1. Will you inform the participants' General Practitioners (and/or any other health or care professional responsible for their care) that they are taking part in the study?

◉ Yes ◯ No

If Yes, please enclose a copy of the information sheet/letter for the GP/health professional with a version number and date.

A49-2. Will you seek permission from the research participants to inform their GP or other health/ care professional?

◉ Yes ◯ No

It should be made clear in the participant's information sheet if the GP/health professional will be informed.

PUBLICATION AND DISSEMINATION

A50. Will the research be registered on a public database?

The UK Policy Framework for Health and Social Care Research sets out the principle of making information about research publicly available. Furthermore: Article 19 of the World Medical Association Declaration of Helsinki adopted in 2008 states that "every clinical trial must be registered on a publicly accessible database before recruitment of the first subject"; and the International Committee of Medical Journal Editors (ICMJE) will consider a clinical trial for publication only if it has been registered in an appropriate registry. Please see guidance for more information.

◉ Yes ◯ No

Please give details, or justify if not registering the research.
We will strive to publish the pilot study in a peer reviewed journal.

Please ensure that you have entered registry reference number(s) in question A5-1.

A51. How do you intend to report and disseminate the results of the study? *Tick as appropriate:*

- ☑ Peer reviewed scientific journals
- ☑ Internal report
- ☑ Conference presentation
- ☑ Publication on website
- ☐ Other publication
- ☐ Submission to regulatory authorities
- ☐ Access to raw data and right to publish freely by all investigators in study or by Independent Steering Committee on behalf of all investigators
- ☐ No plans to report or disseminate the results
- ☐ Other (please specify)

A52. If you will be using identifiable personal data, how will you ensure that anonymity will be maintained when publishing the results?

All participants will be assigned a unique study number during the study and all subsequent information will only be identifiable by this number. The association between the participant's name and the study number will be stored electronically in a password protected file separate to participant data on a secure computer at Lancaster University. Any identifiable information revealed in self-report measures will be removed during data entry to maintain confidentiality.

A53. How and when will you inform participants of the study results?

If there will be no arrangements in place to inform participants please justify this.
Participants will be asked on entry to the study if they would like to be informed of the results. All participants wishing to be informed of the results will receive an end of study newsletter, with a lay summary. This will be created by the trainee clinical psychologist.

5. Scientific and Statistical Review

A54. How has the scientific quality of the research been assessed? *Tick as appropriate:*

- ☐ Independent external review
- ☐ Review within a company
- ☐ Review within a multi–centre research group
- ☑ Review within the Chief Investigator's institution or host organisation
- ☑ Review within the research team
- ☑ Review by educational supervisor
- ☑ Other

Justify and describe the review process and outcome. If the review has been undertaken but not seen by the researcher, give details of the body which has undertaken the review:
Also peer reviewed by member of the department at Lancaster University.

For all studies except non-doctoral student research, please enclose a copy of any available scientific critique reports, together with any related correspondence.

For non-doctoral student research, please enclose a copy of the assessment from your educational supervisor/ institution.

A56. How have the statistical aspects of the research been reviewed? *Tick as appropriate:*

- ☐ Review by independent statistician commissioned by funder or sponsor
- ☐ Other review by independent statistician
- ☐ Review by company statistician
- ☐ Review by a statistician within the Chief Investigator's institution
- ☑ Review by a statistician within the research team or multi–centre group
- ☑ Review by educational supervisor
- ☐ Other review by individual with relevant statistical expertise
- ☐ No review necessary as only frequencies and associations will be assessed – details of statistical input not required

In all cases please give details below of the individual responsible for reviewing the statistical aspects. If advice has been provided in confidence, give details of the department and institution concerned.

Title	Forename/Initials	Surname
Dr	Jasper	Palmier-Claus

Department	Senior Lecturer & Principal Clinical Psychologist
Institution	Lancaster University
Work Address	Health Innovation Campus
	Lancaster
Post Code	LA14YW
Telephone	07742781645
Fax	
Mobile	07742781645
E-mail	J.Palmier-Claus@lancaster.ac.uk

Please enclose a copy of any available comments or reports from a statistician.

A57. What is the primary outcome measure for the study?

We will record feasibility outcomes by:
i)We will be recording pertinent information on participant flow, including the numbers of referrals, consents, and withdrawals. Feasibility outcomes are as follows: attendance to sessions ii) rates of recruitment iii) completion of tasks allocated to participants outside of sessions iv) attrition at follow up and post treatment (12 weeks) v) the amount of clinical outcome data missing. The trainee clinical psychologist will also record session attendance, reasons for individuals not attending, and information on the amount of assessment and intervention sessions completed.

One aim of this pilot study is to investigate what aspects of suicidal experiences might be an appropriate primary clinical outcome for a future clinical trial. Death by suicide occurs too infrequently to be a meaningful outcome measure. However, suicidal ideation predicts subsequent suicide attempts. Suicidal ideation is a common, distressing and a legitimate outcome and this intervention may help to prevent suicide. The study will measure suicidal ideation as a likely primary outcome for a definitive trial using the gold-standard Beck Scale for Suicidal Ideation.

A58. What are the secondary outcome measures?*(if any)*

Not applicable.

A59. What is the sample size for the research? *How many participants/samples/data records do you plan to study in total? If there is more than one group, please give further details below.*

Total UK sample size:	10
Total international sample size (including UK):	10
Total in European Economic Area:	0

Further details:
We will aim to recruit 5-10 individuals to take part in the study.

A60. How was the sample size decided upon? *If a formal sample size calculation was used, indicate how this was done, giving sufficient information to justify and reproduce the calculation.*

We decided this based on research literature. Zidan et al 2012., suggests that a case series study should have more than four participants and no more than 10.

A61. Will participants be allocated to groups at random?

○ Yes ◉ No

A62. Please describe the methods of analysis (statistical or other appropriate methods, e.g. for qualitative research) by

which the data will be evaluated to meet the study objectives.

SPSS statistics will be used to analyse trends within data.
Graphs and tables of descriptive statistics will be produced.
ANOVA T test or Wilcoxon signed-rank test to assess differences between participants' scores at baseline and post intervention and at baseline and follow up.
Summary effect sizes (Cohen's d) to be used to assess changes between baseline and post intervention and baseline and follow up, to be interpreted using the within subject standard deviation.
Confidence interval's (CI) for mean differences to be also calculated.
Individual reliable improvement and deterioration calculated by using Reliable Change Index (Jacobson & Traux, 1991)

6. MANAGEMENT OF THE RESEARCH

A63. Other key investigators/collaborators. *Please include all grant co–applicants, protocol co–authors and other key members of the Chief Investigator's team, including non-doctoral student researchers.*

	Title	Forename/Initials	Surname
	Dr	Jasper	Palmier-Claus
Post	Senior Lecturer & Principal Clinical Psychologist		
Qualifications	BSc, MSc, PhD, ClinPsyD		
Employer	Lancaster University		
Work Address	Health Innovation Campus Lancaster University Lancaster		
Post Code	LA14YW		
Telephone			
Fax			
Mobile	01524663086		
Work Email	J.Palmier-Claus@lancaster.ac.uk		

	Title	Forename/Initials	Surname
	Prof.	Bill	Sellwood
Post	Programme Director		
Qualifications	PhD - 2001 Clinical Psychology - University of Manchester MSc – 1989 - Clinical Psychology University of Manchester - Qualification as a clinical psychologist BSc – 1987 - Psychology (2i) - University of Manchester		
Employer	Lancaster University		
Work Address	Health Innovation Campus Lancaster University Lancaster		
Post Code	LA14YW		
Telephone	+44 (0)1524 65201		
Fax			
Mobile			
Work Email	b.sellwood@lancaster.ac.uk		

	Title	Forename/Initials	Surname
	Miss	Claudia	Daley

Post	Trainee Clinical Psychologist
Qualifications	BSc, MSc
Employer	LSCFT
Work Address	Sceptre Point Sceptre Way Walton Summit Preston
Post Code	PR5 6AW
Telephone	07519662014
Fax	
Mobile	07519662014
Work Email	c.daley@lancaster.ac.uk

A64. Details of research sponsor(s)

A64-1. Sponsor

Lead Sponsor

Status:
- ○ NHS or HSC care organisation
- ◉ Academic
- ○ Pharmaceutical industry
- ○ Medical device industry
- ○ Local Authority
- ○ Other social care provider (including voluntary sector or private organisation)
- ○ Other

Commercial status: Non-Commercial

If Other, please specify:

Contact person

Name of organisation	Lancaster University
Given name	Rebecca
Family name	Gordon
Address	Head of Research Quality and Policy, Bowland Main
Town/city	Lancaster University
Post code	LA1 4YT
Country	United Kingdom
Telephone	+44 (0)1524 65201
Fax	
E-mail	sponsorship@lancaster.ac.uk

Legal representative for clinical investigation of medical device (studies involving Northern Ireland only)
Clinical Investigations of Medical Devices that take place in Northern Ireland must have a legal representative of the sponsor that is based in Northern Ireland or the EU

Contact person

Name of organisation
Given name
Family name
Address
Town/city
Post code
Country
Telephone
Fax
E-mail

A65. Has external funding for the research been secured?

Please tick at least one check box.

- [ ] Funding secured from one or more funders
- [ ] External funding application to one or more funders in progress
- [x] No application for external funding will be made

What type of research project is this?

- (•) Standalone project
- ( ) Project that is part of a programme grant
- ( ) Project that is part of a Centre grant
- ( ) Project that is part of a fellowship/ personal award/ research training award
- ( ) Other

Other – please state:

A66. Has responsibility for any specific research activities or procedures been delegated to a subcontractor (other than a co-sponsor listed in A64-1) ? *Please give details of subcontractors if applicable.*

( ) Yes (•) No

A67. Has this or a similar application been previously rejected by a Research Ethics Committee in the UK or another country?

( ) Yes (•) No

Please provide a copy of the unfavourable opinion letter(s). You should explain in your answer to question A6-2 how the reasons for the unfavourable opinion have been addressed in this application.

A68-1. Give details of the lead NHS R&D contact for this research:

	Title	Forename/Initials	Surname
		Beverley	Lowe
Organisation	Lancashire & South Cumbria NHS Foundation Trust		
Address	Research & Development		
	Lancashire & South Cumbria NHS Foundation Trust		
	Lantern Centre		
Post Code	PR2 8DW		
Work Email	beverley.lowe@lscft.nhs.uk		
Telephone	01772 773498		
Fax			
Mobile			

Details can be obtained from the NHS R&D Forum website: http://www.rdforum.nhs.uk

A69-1. How long do you expect the study to last in the UK?

Planned start date: 24/04/2023
Planned end date: 30/08/2024
Total duration:
Years: 1 Months: 4 Days: 7

A71-1. Is this study?

- (•) Single centre
- ( ) Multicentre

A71-2. Where will the research take place? *(Tick as appropriate)*

- [x] England
- [ ] Scotland
- [ ] Wales
- [ ] Northern Ireland
- [ ] Other countries in European Economic Area

Total UK sites in study

Does this trial involve countries outside the EU?

( ) Yes (•) No

A72. Which organisations in the UK will host the research? *Please indicate the type of organisation by ticking the box and give approximate numbers if known:*

[x] NHS organisations in England	3
[ ] NHS organisations in Wales	
[ ] NHS organisations in Scotland	
[ ] HSC organisations in Northern Ireland	
[x] GP practices in England	5
[ ] GP practices in Wales	
[ ] GP practices in Scotland	

☐ GP practices in Northern Ireland	
☐ Joint health and social care agencies (eg community mental health teams)	
☐ Local authorities	
☐ Phase 1 trial units	
☐ Prison establishments	
☐ Probation areas	
☐ Independent (private or voluntary sector) organisations	
☑ Educational establishments	1
☐ Independent research units	
☐ Other (give details)	
Total UK sites in study:	9

A73-1. Will potential participants be identified through any organisations other than the research sites listed above?

○ Yes ◉ No

A74. What arrangements are in place for monitoring and auditing the conduct of the research?

The sponsor regularly conducts planned and triggered monitoring on projects where appropriate. The research team and sponsor will work together to monitor the conduct throughout where appropriate. We will make this clear to all participants before they agree to take part in the study.

A75-1. What arrangements will be made to review interim safety and efficacy data from the trial? Will a formal data monitoring committee or equivalent body be convened?

In depth discussions will be had with supervisors in supervision about the pilot study, and data will be reviewed for safety purposes.

If a formal DMC is to be convened, please forward details of the membership and standard operating procedures to the Research Ethics Committee when available. The REC should also be notified of DMC recommendations and receive summary reports of interim analyses.

A75-2. What are the criteria for electively stopping the trial or other research prematurely?

Research and clinical trial staff will be required to report any SAEs immediately and within 24 hours using a set reporting template, which will be shared with the sponsor management at Lancaster University. Dr. Jasper Palmier-Claus & Prof Bill Sellwood will also review all SAEs to assess whether they are likely to be the result of any aspect of the pilot study or intervention. SAEs will also be reviewed by an independent academic at Lancaster University. In cases of immediate and obvious concerns about participants' health or safety, the chief investigator may employ urgent safety measures and immediately stop the study, notifying the research ethics committee (REC) of this decision immediately over the telephone and within three days in writing (as per HRA guidelines).

Given the target sample of individuals with psychosis and suicidal ideation, we expect that there might be some SAEs relating to life-threatening behaviour (i.e. suicide attempts) across the whole sample group. The research supervisors and sponsor will monitor and review the number of SAEs in the pilot study. Should we record considerably higher rates of SAEs, we will recommend pausing the research whilst investigating further or stopping it completely.

The trainee clinical psychologist (student researcher) will have a space to debrief with supervisors regarding SAEs and has two supervisors who she can refer to if she is unable to deal with the situation at the time/ requires extra support.

A76. Insurance/ indemnity to meet potential legal liabilities

***Note:** in this question to NHS indemnity schemes include equivalent schemes provided by Health and Social Care (HSC) in Northern Ireland*

A76-1. What arrangements will be made for insurance and/or indemnity to meet the potential legal liability of the sponsor(s) for harm to participants arising from the management of the research? *Please tick box(es) as applicable.*

Note: Where a NHS organisation has agreed to act as sponsor or co-sponsor, indemnity is provided through NHS schemes. Indicate if this applies (there is no need to provide documentary evidence). For all other sponsors, please describe the arrangements and provide evidence.

☐ NHS indemnity scheme will apply (NHS sponsors only)

☑ Other insurance or indemnity arrangements will apply (give details below)

Lancaster University legal liability cover will apply.

Please enclose a copy of relevant documents.

A76-2. What arrangements will be made for insurance and/ or indemnity to meet the potential legal liability of the sponsor(s) or employer(s) for harm to participants arising from the design of the research? *Please tick box(es) as applicable.*

Note: Where researchers with substantive NHS employment contracts have designed the research, indemnity is provided through NHS schemes. Indicate if this applies (there is no need to provide documentary evidence). For other protocol authors (e.g. company employees, university members), please describe the arrangements and provide evidence.

☐ NHS indemnity scheme will apply (protocol authors with NHS contracts only)

☑ Other insurance or indemnity arrangements will apply (give details below)

Lancaster University legal liability cover will apply.

Please enclose a copy of relevant documents.

A76-3. What arrangements will be made for insurance and/ or indemnity to meet the potential legal liability of investigators/collaborators arising from harm to participants in the conduct of the research?

Note: Where the participants are NHS patients, indemnity is provided through the NHS schemes or through professional indemnity. Indicate if this applies to the whole study (there is no need to provide documentary evidence). Where non-NHS sites are to be included in the research, including private practices, please describe the arrangements which will be made at these sites and provide evidence.

☑ NHS indemnity scheme or professional indemnity will apply (participants recruited at NHS sites only)

☑ Research includes non-NHS sites (give details of insurance/ indemnity arrangements for these sites below)

Lancaster University legal liability cover will apply.

Please enclose a copy of relevant documents.

A77. Has the sponsor(s) made arrangements for payment of compensation in the event of harm to the research participants where no legal liability arises?

○ Yes ◉ No

Please enclose a copy of relevant documents.

A78. Could the research lead to the development of a new product/process or the generation of intellectual property?

(●) Yes ( ) No ( ) Not sure

PART C: Overview of research sites

Please enter details of the host organisations (Local Authority, NHS or other) in the UK that will be responsible for the research sites. *For further information please refer to guidance.*

Investigator identifier	Research site		Investigator Name	
IN1	(•) NHS/HSC Site ( ) Non-NHS/HSC Site		Forename Middle name Family name	Bill Sellwood
	Organisation name	NHS LANCASHIRE AND SOUTH CUMBRIA INTEGRATED CARE BOARD	Email	b.sellwood@lancaster.ac.uk
	Address	2ND FLOOR PRESTON BUSINESS CENTRE WATLING STREET ROAD FULWOOD PRESTON	Qualification (MD...) Country	BSc, MSc, PhD United Kingdom
	Post Code	PR2 8DY		
	Country	ENGLAND		

PART D: Declarations

D1. Declaration by Chief Investigator

1. The information in this form is accurate to the best of my knowledge and belief and I take full responsibility for it.
2. I undertake to fulfil the responsibilities of the chief investigator for this study as set out in the UK Policy Framework for Health and Social Care Research.
3. I undertake to abide by the ethical principles underlying the Declaration of Helsinki and good practice guidelines on the proper conduct of research.
4. If the research is approved I undertake to adhere to the study protocol, the terms of the full application as approved and any conditions set out by review bodies in giving approval.
5. I undertake to notify review bodies of substantial amendments to the protocol or the terms of the approved application, and to seek a favourable opinion from the main REC before implementing the amendment.
6. I undertake to submit annual progress reports setting out the progress of the research, as required by review bodies.
7. I am aware of my responsibility to be up to date and comply with the requirements of the law and relevant guidelines relating to security and confidentiality of patient or other personal data, including the need to register when necessary with the appropriate Data Protection Officer. I understand that I am not permitted to disclose identifiable data to third parties unless the disclosure has the consent of the data subject or, in the case of patient data in England and Wales, the disclosure is covered by the terms of an approval under Section 251 of the NHS Act 2006.
8. I understand that research records/data may be subject to inspection by review bodies for audit purposes if required.
9. I understand that any personal data in this application will be held by review bodies and their operational managers and that this will be managed according to the principles established in the Data Protection Act 2018.
10. I understand that the information contained in this application, any supporting documentation and all correspondence with review bodies or their operational managers relating to the application:
    - Will be held by the REC (where applicable) until at least 3 years after the end of the study; and by NHS R&D offices (where the research requires NHS management permission) in accordance with the NHS Code of Practice on Records Management.
    - May be disclosed to the operational managers of review bodies, or the appointing authority for the REC (where applicable), in order to check that the application has been processed correctly or to investigate any complaint.
    - May be seen by auditors appointed to undertake accreditation of RECs (where applicable).
    - Will be subject to the provisions of the Freedom of Information Acts and may be disclosed in response to requests made under the Acts except where statutory exemptions apply.
    - May be sent by email to REC members.
11. I understand that information relating to this research, including the contact details on this application, may be held on national research information systems, and that this will be managed according to the principles established in the Data Protection Act 2018.
12. I understand that the main REC or its operational managers may share information in this application or supporting documentation with the Medicines and Healthcare products Regulatory Agency (MHRA) where it is relevant to the Agency's statutory responsibilities.
13. Where the research is reviewed by a REC within the UK Health Departments Research Ethics Service, I understand that the summary of this study will be published on the website of the Health Research Authority (HRA) together with the contact point for enquiries named below. Publication will take place no earlier than 3 months after the issue of the ethics committee's final opinion or the withdrawal of the application.

Contact point for publication*(Not applicable for R&D Forms)*

HRA would like to include a contact point with the published summary of the study for those wishing to seek further information. We would be grateful if you would indicate one of the contact points below.

- ◯ Chief Investigator
- ◯ Sponsor
- ◯ Study co-ordinator
- ◯ Student
- ◯ Other – please give details
- ◯ None

Access to application for training purposes *(Not applicable for R&D Forms)*

Optional – please tick as appropriate:

☐ I would be content for members of other RECs to have access to the information in the application in confidence for training purposes. All personal identifiers and references to sponsors, funders and research units would be removed.

This section was signed electronically by Prof William Sellwood on 17/04/2023 08:37.

Job Title/Post:	Professor of Clinical Psychology
Organisation:	Lancaster University
Email:	b.sellwood@lancaster.ac.uk

D2. Declaration by the sponsor's representative

If there is more than one sponsor, this declaration should be signed on behalf of the co−sponsors by a representative of the lead sponsor named at A64-1.

I confirm that:

1. This research proposal has been discussed with the Chief Investigator and agreement in principle to sponsor the research is in place.
2. An appropriate process of scientific critique has demonstrated that this research proposal is worthwhile and of high scientific quality.
3. Any necessary indemnity or insurance arrangements, as described in question A76, will be in place before this research starts. Insurance or indemnity policies will be renewed for the duration of the study where necessary.
4. Arrangements will be in place before the study starts for the research team to access resources and support to deliver the research as proposed.
5. Arrangements to allocate responsibilities for the management, monitoring and reporting of the research will be in place before the research starts.
6. The responsibilities of sponsors set out in the UK Policy Framework for Health and Social Care Research will be fulfilled in relation to this research.

   Please note: *The declarations below do not form part of the application for approval above. They will not be considered by the Research Ethics Committee.*
7. Where the research is reviewed by a REC within the UK Health Departments Research Ethics Service, I understand that the summary of this study will be published on the website of the National Research Ethics Service (NRES), together with the contact point for enquiries named in this application. Publication will take place no earlier than 3 months after issue of the ethics committee's final opinion or the withdrawal of the application.
8. Specifically, for submissions to the Research Ethics Committees (RECs) I declare that any and all clinical trials approved by the HRA since 30th September 2013 (as defined on IRAS categories as clinical trials of medicines, devices, combination of medicines and devices or other clinical trials) have been registered on a publically accessible register in compliance with the HRA registration requirements for the UK, or that any deferral granted by the HRA still applies.

This section was signed electronically by An authorised approver at sponsorship@lancaster.ac.uk on 14/04/2023 15:34.

Job Title/Post:	Associate Director of Research Services
Organisation:	Lancaster University
Email:	y.fox@lancaster.ac.uk

D3. Declaration for student projects by academic supervisor(s)

1. I have read and approved both the research proposal and this application. I am satisfied that the scientific content of the research is satisfactory for an educational qualification at this level.

2. I undertake to fulfil the responsibilities of the supervisor for this study as set out in the UK Policy Framework for Health and Social Care Research.

3. I take responsibility for ensuring that this study is conducted in accordance with the ethical principles underlying the Declaration of Helsinki and good practice guidelines on the proper conduct of research, in conjunction with clinical supervisors as appropriate.

4. I take responsibility for ensuring that the applicant is up to date and complies with the requirements of the law and relevant guidelines relating to security and confidentiality of patient and other personal data, in conjunction with clinical supervisors as appropriate.

Academic supervisor 1

This section was signed electronically by Prof William Sellwood on 17/04/2023 08:37.

Job Title/Post:	Professor of Clinical Psychology
Organisation:	Lancaster University
Email:	b.sellwood@lancaster.ac.uk

Academic supervisor 2

This section was signed electronically by Dr Jasper Palmier-Claus on 19/04/2023 11:10.

Job Title/Post:	Senior Lecturer/Principal Clinical Psychologist
Organisation:	Lancaster University
Email:	J.Palmier-Claus@lancaster.ac.uk