A thesis submitted in partial fulfilment of the regulations for the degree of

Clinical Psychology Doctorate at the University of Birmingham.

VOLUME I

RESEARCH COMPONENT

Literature Review and Research Paper

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For Nana and Grandad

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Overview

This thesis is submitted in partial fulfilment of the requirements for the degree of Clinical Psychology Doctorate at the University of Birmingham. There are two volumes to the thesis, which illustrate research (Volume I) and clinical work (Volume II).

Volume I contains a literature review, research paper, and public domain paper. The literature review summarises research that explored the impact of different psychological therapies on negative symptoms in schizophrenia and related disorders. The research paper describes an investigation into the negative symptoms experienced by people with schizophrenia or schizoaffective disorder who use cannabis, compared to those who do not. It is intended that both pieces of work will be submitted to 'Schizophrenia Research' for publication. The public domain paper summarises both the literature review and research paper.

Volume II contains five clinical practice reports (CPRs). CPR1 is a case formation about a 21 year old man with a learning disability, an Autistic Spectrum disorder, and who experiences anxiety and shows aggression. CPR2 is a service evaluation about the effectiveness of a multidisciplinary team referral process in a learning disability service. CPR3 documents a single-case experimental design that assessed the effectiveness of a toileting intervention with a ten year boy with secondary encopresis. CPR4 depicts a case study of an 81 year old man with memory loss and depression. An abstract outlining CPR5, a clinical presentation about a 50 year old woman with mixed anxiety and depressive disorder, is also included.

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LITERATURE REVIEW

THE IMPACT OF PSYCHOLOGICAL THERAPIES ON NEGATIVE SYMPTOMS OF SCHIZOPHRENIA AND RELATED DISORDERS

Abstract

Negative symptoms in schizophrenia and related disorders have been associated with poor social functioning (e.g. Bowie, Reichenberg, Patterson, Heaton, & Harvey, 2006), longer hospitalisation (Pogue-Geile & Harrow, 1984), and poor medication compliance (Tattan & Creed, 2001). Therefore, psychological interventions have been introduced to the treatment of psychosis symptoms, either as an adjunct or an alternative to medication. In this review 31 articles published in the past 11 years are described and compared in relation to their effectiveness at reducing negative symptoms. These interventions included Cognitive Behavioural Therapy, family interventions, Cognitive Remediation Therapy, and Body-Oriented Psychological Therapy. Although results varied across studies, the majority of the research suggests that all four psychological therapies are effective at reducing negative symptoms. Improvements were maintained for varying durations, from four weeks to five years. Individual Cognitive Behavioural Therapy appeared to have the most consistent research regarding its potential to improve negative symptoms.

Keywords: negative symptoms; schizophrenia; psychosis; psychological; therapy.

Introduction

Schizophrenia affects approximately one percent of the population during their lifespan (Jones & Meaden, in press). A diagnosis of schizophrenia requires two of the following symptoms to be frequently present for at least one month: negative symptoms (such as poverty of speech, blunted affect, or limited motivation) positive symptoms (such as delusions or hallucinations) or disorganised speech and behaviour (DSM-IV-TR; American Psychiatric Association, 2000). The DSM-IV-TR also states that functioning should be interrupted following symptom onset, symptoms and poor functioning are present for six months or more, and difficulties are not explained by pervasive developmental disorders or mood disorders. Other psychotic disorders include schizophreniform disorder, which occurs for between one and six months; schizoaffective disorder, which includes depressive or manic episodes; delusional disorder, which involves delusions about everyday events but other symptoms of schizophrenia are absent; and psychotic disorders such as brief, and substance induced psychotic disorders (American Psychiatric Association, 2000).

Some researchers have proposed theories that symptoms of schizophrenia are likely to occur in two distinct ‘groups’, namely positive symptoms and negative symptoms (e.g. Crow, 1980; Lewine, Fogg, & Meltzer, 1983). Others have suggested that three groups of symptoms can be differentiated, which they have called ‘psychotic symptoms’, ‘disorganised symptoms’, and ‘negative symptoms’ (Andreasen, Arndt, Alliger, Miller, & Flaum, 1995; Liddle, 1987). Positive symptoms are said to include experiences additional to ‘normal’ functioning, such as delusions, thought disorder, and hallucinations. ‘Negative symptoms’ have been suggested to describe deficits in daily functioning, specifically a loss of emotion and motivation (e.g. Birchwood, Hallett, & Preston, 1989). In DSM-IV-TR (APA, 2000), negative symptoms include affective flattening, ‘alogia’, a term describing poverty of speech,

'avolition', which describes a lack of motivation to achieve goals, and 'anhedonia' a lack of pleasure in normally enjoyable activities. Crow (1980) suggested a neurochemical explanation of symptoms in schizophrenia. He theorised that positive symptoms, or 'type I syndrome' as he described them, were associated with the transmission of dopamine in the brain, whereas the negative symptoms, or 'type 2 syndrome', were more likely to occur in association with changes in brain structure. A psychosocial theory of negative symptoms in schizophrenia suggests that they occur as an avoidance reaction towards problematic psychological and social situations, such as rejection from society. Whilst initially protective, these symptoms are said to be maintained as social opportunities that could increase motivation and pleasure are avoided, and skill retention is impeded (e.g. Strauss, Carpenter, & Barko, 1974; Strauss, Rakfeldt, Harding, & Lieberman, 1989). A contrasting psychoanalytical view is that negative symptoms stem from an inability to relate to other individuals (Meehl, 1962). Another theory, which combines biological and psychological perspectives, suggests that there are two types of negative symptoms. King (1998) suggested that 'primary negative symptoms' are deficits caused by the disorder itself, whereas 'secondary negative symptoms' are a consequence of positive symptoms, sedation, depression, or extrapyramidal side effects from antipsychotic medication.

Negative symptoms appear to be more prone in some individuals with psychosis than others. For example, it appears that males are more likely to experience negative symptoms (Schultz et al., 1997) particularly blunted affect (Goldstein, Santangelo, Simpson, & Tsaung, 1990) and emotional withdrawal (Josiassen, Roemer, Johnson, & Shagass, 1990). Individuals of any age may experience negative symptoms, and they may persist throughout the course of the illness, despite likely reductions in positive symptoms in older age (Davidson et al., 1995; Johnstone, Owens, Colter, & Crow, 1989; Pfohl & Winokur, 1982; Schultz et al., 1997). All

ethnicities researched seem to experience negative symptoms, and these do not appear to differ across ethnicities (Arnold, et al., 2002; Barrio et al., 2003; Dassori et al., 1998).

The Impact of Negative Symptoms

Negative symptoms have been negatively correlated with overall functioning (e.g. Siegel et al., 2006), social functioning (Bowie et al., 2006; Breier, Schreiber, Dyer, & Picker, 1991; Brill et al., 2009; Hwu, Tan, Chen, & Yeh, 1995; Pogue-Geile & Harrow, 1984); occupational functioning (Breier et al., 1991; Brill et al., 2009; Pogue-Geile & Harrow, 1984); and independent functioning (Breier et al., 1991). Severe levels of negative symptoms are related to longer hospitalisation (Pogue-Geile & Harrow, 1984) and less medication compliance (Tattan & Creed, 2001), compared to those with less or no negative symptoms. If negative symptoms are persistent, and are associated with adverse outcomes, it seems key that the experiences of these symptoms are understood and effective interventions are identified to reduce them.

Treatments for Negative Symptoms

National Guidelines

The National Institute for Health and Clinical Excellence recently produced guidelines regarding the treatment of schizophrenia (NICE; 2009). Although recommended treatments were outlined, such as antipsychotics, cognitive behavioural therapy (CBT) and family interventions, there was a lack of interventions specifically recommended to reduce negative symptoms. Art therapy was suggested as a treatment option for people with negative

symptoms to enhance communication skills and help them understand emotions, and thus not specifically aiming to reduce negative symptoms.

Pharmacological Interventions

Carpenter, Heinrichs, and Alphs (1985) reviewed the effects of typical antipsychotics and suggested that whilst some negative symptoms reduce as medication improves positive symptoms; some medication can create difficulties like emotional blunting, social withdrawal and apathy. It has been suggested by some researchers that people who suffer from severe negative symptoms may benefit from a reduction (Kane, Rifkin, Woerner, & Reardon, 1982) or cessation of their typical antipsychotic medication (Carpenter & Heinrichs, 1983). With regards to atypical antipsychotics, King (1998) noted that any improvements in negative symptoms may be due to reductions in secondary rather than primary negative symptoms.

As negative symptoms have been associated with non-compliance with medication (Tattan & Creed, 2001), this suggests that an alternative treatment is required. As recommended by the NICE Guidelines for Schizophrenia (NICE, 2009) the alternative or adjunct to pharmacological treatments should be psychological interventions.

Aims of Current Literature Review

No literature reviews focusing specifically on the effects of psychological therapies on negative symptoms were found. However, three systematic reviews, published in 2000, were found that focussed on the effects of different psychological interventions on all symptoms of psychosis (Psychosocial Skills Training, Heinssen, Liberman, & Kopelowicz, 2000; Family

psychoeducation, Dixon, Adams, & Lucksted, 2000; CBT, Garety, Fowler, & Kuipers, 2000). Within these reviews, they found that negative symptoms reduced following CBT (Tarrier et al., 1998), Psychoeducation, social skills and problem solving skills training (Halford, Harrison, Kalyansundaram, Moutrey, & Simpson, 1995), and family education (Mingyuan et al., 1993). This systematic review aims to assess the impact of psychological therapies on negative symptoms of psychosis. Articles published after the search dates for the previous three reviews were included. The review intends to assess the evidence for the effectiveness of different interventions, address the limitations of current literature, and further research will be recommended.

Search Strategy

Recent articles relating to psychological treatments for negative symptoms in psychosis were identified using four electronic databases, PsycInfo, Medline, EMBASE, and Cinahl, covering the years 1999 until March 2010. The following search terms were used: (affect* OR effect* OR success* OR efficac* OR outcome* OR evaluat*) AND ((psycholog* OR behavio* OR remediation* OR cognit* OR art* OR famil* OR psychodynamic OR psychoanalytic OR morita OR motivation* OR psychosocial OR psychoeducation* OR interperson*) adj3 (treatment* OR intervention* OR rehabilita* OR therap* OR interview*). OR (problem adj1 solv*). OR CBT. AND (exp "POSITIVE AND NEGATIVE SYMPTOMS"/ (negative adj1 symptoms). OR (anhedonia OR avolition OR alogia)) AND (psychos* OR schizophreni* OR "schizotypal disorder*" OR "delusional disorder*" OR "schizoaffective disorder*"). The search terms were chosen to encompass the key elements of the title of this review.

The search results were limited to empirical studies written in English, this produced 265 unique articles across the four search engines. One hundred and ninety one of these were disregarded as they did not report the effects of a solitary therapeutic intervention for psychosis, 35 were eliminated as they were not empirical papers but rather reviews or international dissertation abstracts, and a further 11 were excluded as they did not report measurements of negative symptoms. Therefore 31 journal articles remained, which described 24 studies. Two additional papers were retrieved from reference lists of 'follow-up' papers, and where the original papers had not been highlighted by the electronic search. These articles are detailed in Table 1.

Terminology

The term 'Psychosis' refers to a group of psychotic disorders (DSM-IV-TR; American Psychiatric Association, 2000) including schizophrenia, schizoaffective disorder, delusional disorder, and psychotic disorders. In this review 'psychosis' will be used when research included individuals with a variety of these disorders. However, it is recognised that negative symptoms may differ between these disorders. When research only included individuals with schizophrenia, this will be identified.

'Psychological therapies' refers to non-pharmacological treatments that aim to improve outcome. Solitary psychological therapies that effect negative symptoms will be considered here. Therefore articles that included two therapeutic components, such as CBT and family psychoeducation, were not included. The psychological therapies identified during the electronic search as being published in the past 11 years were CBT, family interventions, Cognitive Remediation Therapy (CRT), and Body-Orientated Psychological Therapy (BPT).

Historically the main psychological intervention offered for negative symptoms have been behavioural approaches including token economies (e.g. Li & Wang, 1994), social skills training (e.g. Dobson, McDougall, Busheikin, & Aldous, 1995) and problem-solving skills training (e.g. Slade & Bentall, 1989). Although some of the recent research encompasses social skills and problem-solving strategies, no recent articles evaluating these interventions were found.

Table 1

Psychological Interventions for Psychosis that have Assessed Negative Symptoms.

Study	Participants	Intervention	Methodology	Results
CBT Interventions				
Klingberg et al., 2009	N=198, Outpatients. Schizophrenia with negative symptoms, no positive symptoms. Total sample: Mean age: 36.9; age at first hospitalisation: 24.4; 56.1% male.	Individual Formulation-based CBT. Focus: negative symptoms	RCT. Single Blind assessment Design: 2 groups: 1) CBT. 20, 50 min sessions. over 9 months. 2) CRT (controlled for being in a trial and having therapy). CRT not described.	Data not available currently.
Serruya & Grant, 2009.	Outpatients. Paranoid schizophrenia 25 years old. Caucasian. Male. Duration of illness: 1 year approximately.	CBT. Focus: negative symptoms, engagement, delusions.	Case Study. Single Blind assessment Method: individualised CBT for 6 months/38 sessions. Measures at pre, post, and at 12 mth follow-up .	Negative symptoms reduced (but no statistics in article). Reductions in alogia, avolition-apathy, and anhedonia-asociality from baseline to follow-up. Delusions reduced from pre to post to follow-up.
Christodoulides, Dudley, Brown, Turkington, & Beck, 2008.	N=3, Outpatients. Schizophrenia. Age range from 16 – 60 years. Males and females. Duration of illness: 5-8 years.	Individual CBT for persistent positive symptoms. Focus: symptoms, distress, decreasing disability, anxiety and depression.	Case series. Data from Sensky et al (2000) RCT. Measures at Pre, post-treatment and follow-up.	Case B: sig decrease in negative symptoms. Case A and C showed trend of decrease post therapy.
Turkington et al., 2008.	N=59, Outpatients. Schizophrenia with persistent positive symptoms. 31 CBT followed-up, 28 BF followed up. No significant difference at baseline.	Individual CBT for persistent positive symptoms. Focus: symptoms, distress, decreasing disability, anxiety and depression.	RCT. 5-year Follow-up from Sensky et al (2000) study. Participants attended 20 sessions of CBT over 9 months, or befriending for 9 months. Measures at pre, post, 18 mth, 5 yr follow-up.	CBT Vs Befriending: CBT significant decrease: negative symptoms and overall symptoms. No difference between groups: positive symptoms, depression, number of days hopitalised.

Amell & Llandrich, 2008.	N=57, Outpatients. Schizophrenia SSTP group: Mean age: 27.7 years (s.d 6.52). 60% male. Duration of illness: 8.25 years (s.d. 6.05). Control: Mean age: 27.8years (s.d.5.79). 63.6% male. Duration of illness: 8.36 years (s.d.5.34 years). No sig group differences in demographics.	Social skills training programme in groups.	Quasi effectiveness study. Random assignment to groups. 2 groups: 1) social skills training group (SSTP) (1.5 hours once per week for 20 weeks) and antipsychotic medication; 2) antipsychotics medication only. Measurements at baseline, post-therapy, and 6 month follow-up (after therapy was complete).	Pre Vs post: SSTP: sig decrease: total negative symptoms, emotional withdrawal, social withdrawal, lack of spontaneity, anxiety, poor attention, preoccupation, active social avoidance, and volition. Increased social role. Post Vs Follow-up: SSTP: sig increases in blunted effect, stereotyped thinking, and volition disturbance. Roles maintained.
Turkington et al., 2006.	N=336, Inpatient and Outpatients. Schizophrenia. Participants recruited: mostly male, white (specific values not reported). No significant group differences at baseline.	Technique based CBT. Focus: managing positive symptoms and negative symptoms, medication compliance, beliefs about self and others, and relapse prevention.	Quasi effectiveness study 2 groups: 1) CBT group (each person had 6 sessions over 2-3 months plus 3 sessions for carer if patient agreed); 2) Treatment as usual (TAU) Measures at baseline, post and 12 mth follow-up.	Follow-up: CBT: sig increase: insight, sig decrease: total negative symptoms, apathy, avolition, and asociality, number of relapses, time in hospital, compared to TAU. No difference: psychotic symptoms.
Granholm, Auslander, Gottlieb, McQuaid, & McClure, 2006.	N=32 (CBT group from 2005 study), Outpatients. Schizophrenia or schizoaffective disorder. Mean age: 54.2 years (s.d 7.0) range 42-74. N=32: Caucasian (81%). Male (75%). Mean duration of illness: 29.3 years; (s.d=9.2).	Cognitive-behavioural social skills training group (CBSST)	RCT Described CBT group (from an original CBT, TAU comparison in 2005). CBT: 24, 2-hour group sessions (modules repeated twice to compensate for cognitive impairment) Measures at baseline and post- group.	CBSST: increased: cognitive insight - correlated with greater reduction in positive, negative, total symptoms, participation. Greater participation – correlated with greater reduc. in total negative symptoms.
Barrowclough et al., 2006.	N=113, Outpatients. Schizophrenia or schizoaffective disorder with persistent positive symptoms. Total sample: 82 (72.6%) male; Mean age: 38.83 years (s.d.8.6); Mean illness. Duration was 13.67 years (s.d.7.99).	Group CBT. Focus: delusional and hallucinations.	RCT Compared 2 groups: 1) CBT group and TAU (18, 2-hr sessions for 6 months); 2) TAU. Measurements taken at baseline, 6 months (post); and 12 months (follow-up)	CBT Vs TAU: no difference: positive, negative (trend to sig), global, total symptoms, relapse, functioning at post or follow-up. CBT: sig reductions: feelings of hopelessness, low self-esteem at follow-up.

Knight, Wykes, & Hayward, 2006.	N=21, Inpatients and Outpatients. Schizophrenia spectrum disorders. Mean age: 39.32 (s.d. 8.785); 11 males; ethnicity: 9 white, 8 black, 1 south African, 3 other. Mean age of onset: 25.89 (s.d. 7.661).	CBT group. Focus: stigma and self-esteem, and maladaptive coping strategies.	Quasi effectiveness study Waitlist control. CBT: one hour per week. Measures at baseline (week 0) pre (week 6) post (week 12) and follow-up (week 18).	Control phase: no difference in symptoms. Baseline Vs Post: sig improvements in self-esteem, positive symptoms, negative symptoms, depression. Follow-up: remain sig improved: positive, negative, general symptoms.
Warman, Grant, Sullivan, Caroff, & Beck, 2005.	N=6. Unclear setting. Paranoid schizophrenia and schizoaffective disorder. Mean age: 48.83 years (s.d. 5.3) (range 44-59). 6 (100%) males; mean age of first episode: 21.4 years (s.d. 1.5).	Individual and group CBT for schizophrenia; depression; anxiety.	Quasi effectiveness study. Single blind assessment at follow up. No control. All 6 had therapy. Therapy alternated between group and individual sessions weekly (24 weeks). Measures at baseline, post, 11 mth follow-up.	Baseline to post: sig decrease: negative, positive symptoms, delusions, anxiety and depression. No change: hallucinations. Baseline to follow-up: sig decrease: positive symptoms. No difference: negative symptoms, delusions, depression, anxiety and hopelessness.
Startup, Jackson, Evans, & Bendix, 2005.	N=60, Acute Inpatients. Schizophrenia spectrum disorder. No demographic data in article. No significant difference between groups.	Individual CBT: formulation based.	RCT Compared two groups: 1) TAU (pharmacology, inpatient, and community nursing care). 2) TAU and CBT. Measures at baseline, and 6, 12, 24months	CBT Vs TAU: CBT sig reductions: negative symptoms at post and 24 month follow-up. Positive symptoms at post. Sig increases: social functioning at post and follow-up.
Temple, & Ho, 2005.	N=19. Outpatients. Schizophrenia with persistent positive symptoms. CBT (n=10): Mean age: 29.8 (s.d. 9.16); 5 males; age of onset: 21 (s.d. 7.2). TAU (n=9): mean age: 35.9 (s.d. 5.6); 5 males; age of onset: 24.2 (s.d. 8.3).	Individual CBT. Focus: symptoms, daily adaptive functioning.	Quasi effectiveness study Case controlled 2 groups: 1) CBT (up to 20 individual sessions); 2) TAU. Measures at baseline and six months.	CBT Vs TAU: CBT sig improvement: psychosocial functioning, overall symptoms, delusions, clinical global impression of improvement, and global assessment scale at 6 months. Trend towards significance in reduced negative symptoms ($p<0.06$)

Gumley et al., 2003.	N=144. Outpatients. Schizophrenia or 'related disorders' with relapse in previous 2 years. CBT (n=72): mean age: 35.8 (s.d. 9.6); 54 (75%) males; dur of illness: 113 mths (s.d. 81); CBT had lower self-esteem. TAU (n=72): mean age: 36.7 (s.d. 10.1); 51 (70.8%) males; dur of illness: 114 mths (s.d. 84).	Individual CBT. Focus: relapse education and prevention.	RCT 2 groups: 1) CBT and TAU (5 session engagement, and intensive targeted phase twice per week when prodromal signs/early signs detected, CBT terminated when early signs at baseline level); 2) TAU (CMHT clients). Measurements at baseline, 12, 26, 52 weeks. Early signs every 2 weeks.	CBT Vs TAU: CBT sig improvements: positive, negative, global symptoms, independent functioning, prosocial activities. Less people relapsed.
Rector, Seeman, & Segal, 2003.	N=42, Outpatients. Schizophrenia or schizoaffective disorder with persistent positive and negative symptoms. CBT and ETAU (n=24): mean age 37.5 (s.d.8.3); 62% male; age first diagnosis: 25.3 (s.d. 6.4); ETAU (n=18):age 41.2 (s.d 10.9); 28% male; age first diagnosis: 23.2 (s.d. 7.0); No significant group differences at baseline.	Individual CBT. Focus: engagement, normalising, improving positive symptoms and negative symptoms, anxiety, depression, relapse prevention.	RCT Single blind assessors 2 groups (randomly assigned): 1) CBT (20 sessions of individual CBT over 6 months) and ETAU (enriched standard treatment); 2) ETAU only. Measurements taken at pre-, post-, and 6 month follow-up (6 months from post measures; 12 months from pre measures)	CBT and ETAU sig reduced: negative, positive symptoms to post. Trend towards greater improvement in CBT. CBT sig greater reduction at 6 month follow-up: negative symptoms.
Johns, Sellwood, McGovern, & Haddock, 2002.	N=4, Clinical setting unclear. Schizophrenia with persistent negative symptoms, no positive symptoms. Median age: 33 years (range 29-45); gender: 100% male; median duration of illness: 6 years (range 5-20); 2: medication reduced.	Group CBT for negative symptoms particularly targeting avolition/apathy.	Quasi effectiveness study Baseline control for 5-7 weeks. CBT group (16 sessions, 1.5-2hours each). Measurements taken at pre-baseline, pre-intervention, and post-intervention.	Baseline phase: No sig change in symptoms, depression, side effects, Post: sig reduction in avolition/apathy. Trend towards sig reduction in total negative symptoms.
Tarrier et al., 2001.	N=72. Outpatients. Schizophrenia, schizoaffective or delusional disorder.	Individual CBT focusing on increasing coping strategies for recurring positive	RCT 3 groups: 1) CBT + routine care (20 sessions, 2-	CBT Vs Supportive Counselling and TAU: CBT sig improvements: hallucinations,

	CBT (n=24): mean age: 42.29 years; 15 males (63%); duration of illness: 15.13 years. Supportive counselling (n=21): mean age: 39.14 yrs: 15 males (71%); duration: 15.43 yrs. Routine care (n=27). Age: 37.19 yrs; gender: 24 males (89%): duration: 11.85 yrs. No significant group differences at baseline.	symptoms; problem solving to increase functioning; relapse prevention.	weekly over 10 weeks) then after post-treatment 4 booster sessions, 1 per month; 2) Supportive counselling + routine care (same session pattern); 3)TAU. Treatment took 3 months. Measures at pre and post therapy.	delusions. All groups: sig decrease in negative symptoms. Trend towards greater reduction in CBT for negative symptoms, alogia.
Sensky et al., 2000.	N=90, Outpatients. Schizophrenia with persistent positive symptoms. CBT group (n=46): mean age 39 (range 35-42); 31 males (67%); ethnicity: 40 whites, 6 non-whites; duration of illness: 14 years (12-17 yrs). Befriending group (n=44): mean age: 40 years (35-45); 22 males (50%); ethnicity: 40 whites, 4 non-whites; duration of illness: 15 years (11-18 yrs). Sig more females in befriending group then CBT group. Men: higher negative symptoms and global psychopathology at baseline.	Individual CBT for persistent positive symptoms. Focus: understanding symptoms; decreasing distress; decreasing disability, anxiety depression, negative symptoms.	RCT Single blind assessment 2 groups (randomly assigned): 1) CBT; 2)) befriending. Both therapies: 9 months. Average number of sessions was 19. Therapy was conducted by 2 experienced nurses. Measures at baseline, post-therapy, and 9-month follow-up.	CBT Vs Befriending at post: Both sig improved: global psychopathology, negative symptoms, depression. Follow-up: CBT sig greater improvements: global psychopathology, negative symptoms; and depression.
Tarrier et al., 1999.	N=70, Outpatients. Schizophrenia, schizoaffective or delusional disorder with persistent positive symptoms. Whole sample demographics: Mean age: 39.4 years (s.d. 10.9 years); Gender: 74% male; mean duration of illness: 14.2 years (s.d. 9.9 years).	Individual CBT. Focus: coping strategies for reducing positive symptoms; problem solving to increase functioning; relapse prevention.	Quasi effectiveness study Single blind assessment 3 groups (stratified for age and symptom severity): 1) CBT + TAU (20 sessions, 2-weekly over 10 weeks plus 4 booster session); 2) Supportive counselling + TAU (same session pattern as CBT); 3) TAU	CBT Vs TAU : CBT sig improved: positive symptoms, negative symptoms at post. Trend towards sig in negative symptoms at follow-up. Supportive counselling: sig decrease: negative symptoms post and follow-up.

			Measures at pre , post, 12 mths post-treatment (8 months after booster sessions finished).	
Family Interventions				
Bradley et al., 2006	N=50, Outpatients. Schizophrenia, schizoaffective disorder and schizophreniform disorder. Multiple-family grp (n=25): mean age: 33.6 yrs (s.d. 6.68); 28% males; English speaking: 13 (52%). Control grp (n=25):age: 34 yrs (s.d. 9.6); 32% males; English speaking: 17 (68%).	Cognitive-behavioural multi-family group treatment,. Focus: problem-solving. Intervention for one year.	Quasi effectiveness studies 2 groups in each culture group: 1) multi-family group treatment) (26 sessions over 12 months and 3 for family members and 2 half-day psychoeducation sessions); 2) control (case management/TAU). Measures pre, post, and 18-month follow-up.	Family Intervention Vs TAU: Both groups: no change in negative symptoms post or follow-up. Family intervention: improvements: thought disturbance and disorganisation at post, relapse rates at post and follow-up.
Dyck et al., 2000	N=63, Outpatients. Schizophrenia or schizoaffective. Multi-family group (n=32): Age: 33 (s.d. 8 years). 23 (72%) male. 30 (94%) white. Duration of illness: 11years (s.d 8). Standard care (n=31): Age: 33 (s.d. 10 years). 23 (73%) male. 30 (97%) white. Duration of illness: 10years (s.d. 8) No significant group differences at baseline. 48% met criteria for substance abuse.	Psychoeducation in multiple-family groups. Focus: problem solving, engage family, increase social networks, education about schizophrenia. Intervention for 2 years.	Quasi effectiveness study. Single blind assessment. 2 groups randomly assigned (stratified for antipsychotics): 1) Multi-family group psychoeducation + standard. 2) TAU (incl rehabilitative and supported employment for some) Negative symptoms assessed once per month for 12 months (first year of 2-year intervention.)	Family intervention Vs TAU: Family Intervention sig reduced: total negative symptoms, avolition, flattened affect, alogia, asociality, but not inattention.
CRT Interventions				
Eack et al., 2009	N=58. Setting unclear. Schizophrenia or schizoaffective disorder, with social and cognitive disabilities. Total sample: mean age: 25.92 +/- 6.31	Individual and group CRT. Computerised CRT focused on attention, memory, problem-solving, and social-	RCT Design: 2 groups: 1) CRT. 60 (one-hour computerised CRT sessions, one per week, and 45 1.5-hour social-cognitive group sessions, once	CRT Vs enriched supportive therapy: CRT sig reduced: negative symptoms, anxiety, depression, neurocognitive functioning at post and follow-up.

	years; 69% male; Ethnicity: 69% Caucasian, 19% African-American, 10% Asian, average duration of illness: 3.19 years +/- 2.24 years. No significant differences at baseline.	cognitive group sessions. Focus: extracting important parts of social interactions.	per week). 2) 'Enriched Supportive Therapy'. Number and length of sessions not described, but interventions 1 and 2 not matched for number of sessions.	
Wykes et al., 2009	N=85, Outpatients. Schizophrenia with social functioning problems. Mean Age: 36 years; contact with psychiatric services 10+ years: 52% (n=44); 73% male. No sig group differences at baseline except higher symptoms in CRT.	Individual Cognitive remediation therapy. Focus: memory, cognitive flexibility and planning	RCT Design: 2 groups: 1) CRT and TAU (40 face-to-face one hour session including paper and pencil tasks and practice cognitive skills). 2) TAU.	Younger (17- 39 years): Sig reduction in negative symptoms following CRT. Sig improvement in memory and planning post, and improved cognitive flexibility at follow-up. Older (40-65 years): No sig improvements in negative symptoms, planning, cognitive flexibility, post CRT. Improved memory.
Vauth et al., 2005.	N=138, Inpatients. Schizophrenia. Total sample: Mean age= 28.8 years (s.d.7.1); 64.5% male; Mean age of illness onset was 22.8 years (s.d. 5.6); Mean duration of illness=6.6 years (s.d. 5.5). No sig group differences at baseline.	CAST: Group Computer-assisted cognitive strategy training. Focus: selective attention, verbal memory, planning. TSSN: Training of self management skills for negative symptoms	RCT Compared 3 groups: 1) CAST and vocational training; 2) TSSN and vocational training; 3) vocational training (control). Measures taken at baseline/intake, and post intervention (8 weeks later).	TSSN: No sig improvement to negative symptoms vs groups or time. No cognitive improvements. CAST: Sig improvements: verbal memory, negative symptoms, trend towards sig: attention vs control. No sig difference in planning ability.
Bark et al., 2003.	N=54, Inpatients. Schizophrenia and schizoaffective disorder. CRT (n=36): age: 35 (s.d. 7.07); 24 male; age at first hospitalisation: 20.57 (s.d. 4.16). TAU (n=18): age: 38.55; 8 males; mean age of first hospitalisation: 23 (s.d. 7.27). No differences at baseline.	CRT (unclear whether individual or group).	Quasi effectiveness study Single blind assessment Design: 2 groups, 1) 10-sessions CRT (2 types, problem-solving CRT and memory CRT); 2) TAU Measures at pre, post, and 4 week follow-up.	CRT Vs TAU: CRT sig improved: positive, negative, general symptoms, depression. Change was maintained at 4 week follow-up. Memory CRT Vs Problem-Solving CRT: Memory CRT sig improved negative symptoms.

Bellucci, Glaberman, & Haslam, 2003.	N=34, Outpatients. Schizophrenia or schizoaffective disorder without hallucinations or prominent thought disorder. Total sample: 16 (47.1%) male; mean age: 42.0; yrs since first hospitalization: 16.6, yrs since first contact with program: 4.9.	Individual Computer-assisted cognitive rehabilitation (CACR) therapy, focus: attention; visual/motor; conceptual; numeric memory skills.	Quasi effectiveness study Compared 2 groups (randomly assigned): 1) computer-assisted CRT group (16, 30-minute sessions over 8 weeks); 2) wait-list control. Measurements taken at pre and post-therapy.	CACR Vs control: CACR sig reduced: total negative symptoms, anhedonia, flattened affect, verbal learning memory, attention/concentration.
Penadés et al., 2002.	N=8, Outpatients. Schizophrenia with negative symptoms and cognitive impairments. Total sample: 6 males; mean age: 32 years (s.d. 10.4); mean duration of illness: 11.4 years (s.d. 5.5).	Neuropsychological rehabilitation. Focus: cognitive differentiation and social perception, including attentional skills, conceptualisation concepts.	Quasi effectiveness study 24 sessions of rehabilitation over 12 weeks (45mins – 1 hour each). SPECT scan and neuropsychological tests pre and post therapy.	Post: sig reduced: negative symptoms, verbal memory, associative learning, abstraction, executive functioning. No sig change: positive, general symptoms.
BPT Interventions				
Röhricht, Papadopoulos, Suzuki, & Priebe, 2009.	N=24, Outpatients. Schizophrenia with persistent negative symptoms. Mean age: 38.8 years (s.d. 9.3); 50% males; mean duration of illness: 12.1 years (s.d. 10.5); mean number of hospitalisations: 3.7 (s.d. 2.8).	Group BPT. Focus: improve body image, egopathology symptoms and negative symptoms.	RCT, data from BPT group only. Single blind assessment. BPT therapy conducted: 20 sessions, 90 minutes. Pre and post therapy measures.	Post: sig improvements: negative symptoms, ego-pathology subscales 'body', 'activity', 'consistency', & 'demarcation'. No assoc, between ego-pathology and negative symptom. Increased body demarcation at baseline predicted negative symptom change.
Röhricht & Priebe, 2006.	N=45. Outpatients. Schizophrenia with persistent negative symptoms BPT (n=24): mean age: 38.8 yrs (s.d. 9.3); 50% male; dur of illness: 12.1 yrs (s.d.10.5). Supportive Counselling (n=21): age: 37.7yrs (s.d. 9.5); 52% male: dur of illness:10.8 years (s.d. 7.3); No sig group differences at baseline.	Group BPT. Focus: refocus cog and emotional awareness; stimulate activity, and emotional responsiveness; modify self-perception; address boundary loss; somatic depersonalisation; and body schema disturbance.	RCT Single blind assessment 2 groups: 1) BPT; 2) supportive counselling. Both groups: max. 20 group sessions, 10 weeks, 60-90 minutes. Significant difference on number of sessions: BPT mean: 11.3 sessions (s.d. 6.0); Supportive counselling mean: 4.5 sessions (s.d. 4.8). Measures at baseline, post, 4 mth follow-up.	BPT Vs supportive counselling: BPT sig reduced: total negative symptoms, blunted affect, motor retardation at post and follow-up, and after controlling medication and side effects. No change: positive, general symptoms, quality of life. No sig difference between groups on satisfaction or therapeutic relationships.

Cognitive Behavioural Therapy

CBT was first described as being used to relieve psychosis symptoms, specifically delusions, in 1952 (Beck, 2002). Since this time, CBT has been adapted and applied to several symptoms and difficulties in psychosis (Dickerson, 2000; Jones, Cormac, Silveira da Mota Neto, & Campbell, 2004; Rector & Beck, 2001). Kingdon & Turkington (1994) suggested the aim of CBT for psychosis is for individuals to understand symptoms as being due to internal 'normal experiences'. Turkington, Dudley, Warman, and Beck (2004) suggested CBT for schizophrenia could also improve trust, coping skills, and unhelpful responses to symptoms. Birchwood and Trower (2006) suggested CBT for psychosis should aim to prevent relapse, reduce distress, anxiety, depression, and improve self esteem, in individuals experiencing psychotic symptoms, or those at risk of developing psychosis. The NICE guidelines for schizophrenia (NICE, 2009) advise that CBT is provided to all, although there is no suggestion that it should focus specifically on reducing negative symptoms.

Fifteen studies, and nineteen articles, described the effectiveness of CBT at improving negative symptoms.

CBT focusing on reducing symptoms

Two studies aimed primarily to reduce negative symptoms (Johns, Sellwood, McGovern, & Haddock, 2002; Klingberg et al, 2009). Klingberg and colleagues' (2009) randomised controlled trial (RCT) has only recently been completed and data was unavailable at the time of this review. Johns and colleagues (2002) conducted group-based CBT targeting avolition and apathy within a routine clinical setting, although it was unclear whether

participants were inpatients or outpatients. The intervention achieved the aim of significantly reducing avolition/apathy. There was also a trend towards a significant reduction in negative symptoms overall, as measured on the Scale of the Assessment of Negative Symptoms (SANS; Andreasen, 1984). Unfortunately the sample was small. Also two individuals had reductions in medication during the intervention, and therefore this may be a confounding variable. Johns and colleagues research did however suggest that CBT in a clinical setting holds promise in being able to reduce avolition in a group of males with schizophrenia, when compared to no intervention.

The three studies that focused on altering positive symptoms were RCTs (Barrowclough et al., 2006; Sensky et al., 2000; Tarrier et al., 2001). Sensky and colleagues (2000) conducted an RCT comparing individual CBT and individual 'Befriending' sessions. As the sample had persistent positive symptoms, CBT focused primarily on reducing these, but also incorporated interventions for negative symptoms, anxiety and depression if required. Both CBT and Befriending showed significant improvements in negative symptoms, positive symptoms and depression post therapy. There was no significant statistical difference between CBT and Befriending, which suggests that both interventions were equally as effective at reducing both positive and negative symptoms, and depression. Nine months post therapy, the Befriending condition showed elevated positive and negative symptoms, whilst the CBT condition continued to show reductions in these. In a five-year follow-up of 59 individuals from this study, the CBT condition showed significant improvements in negative symptoms compared to the Befriending group, suggesting that the effects of CBT on negative symptoms are more durable than Befriending. Positive symptoms and depression did not differ between groups at this time (Turkington et al, 2008). The authors suggested that certain techniques such as graded activity scheduling, recording thoughts, mastery and pleasure, may have

activated the prefrontal cortex. They also suggested negative symptoms may remain low following CBT as perceived stigma may have reduced and consequently social interactions may have increased. Following random assignment, there were demographic differences between interventions. The Befriending condition had more females than the CBT condition. Consistent with gender trends in the literature (Goldstein et al., 1990; Josiassen et al., 1990; Schultz et al., 1997), males in this study had significantly more severe negative symptoms than females before therapy. CBT therefore included more individuals with more severe negative symptoms than Befriending at baseline. Yet these symptoms improved to similar levels in both groups following therapy, suggesting CBT is effective even when negative symptoms are quite severe. Due to the lack of a control group it cannot be concluded that improvements would not have occurred without any psychological intervention, and does not refute the possibility of spontaneous recovery or improvements being due to medication. However, three individuals not taking medication whilst attending CBT in the RCT also showed improvements in symptomatology, and thus the improvements were attributed to CBT (Christodoulides, Dudley, Brown, Turkington, & Beck, 2008).

In Tarrier and colleagues' (2001) RCT, there was a group that received no therapeutic intervention. They found that their individual CBT intervention, 'supportive counselling' condition and 'treatment as usual' condition all showed significant reductions in negative symptoms following intervention. There was a trend towards significantly greater improvements in negative symptoms following CBT, compared to supportive counselling and treatment as usual. All groups were comparable in terms of demographic variables, and therefore it is likely that this difference was due to treatment variables. The evidence from the Tarrier studies (Tarrier et al., 1999; Tarrier et al., 2001) adds to Sensky and colleagues' (2000) finding that CBT focusing on reducing persistent positive symptoms is effective at

reducing negative symptoms. However, the two CBT interventions are not comparable. Sensky and colleagues focused on positive and negative symptoms and depression and anxiety, whilst Tarrier and colleagues focused on coping strategies to deal with positive symptoms, and reducing relapse rates. Although participants in both studies had similar durations of illness, and mean age, there were more males in Tarrier and colleague's control conditions, and included people with schizophrenia, schizoaffective and delusion disorders, whilst Sensky and colleagues' sample had schizophrenia.

Barrowclough and colleagues (2006) compared group-based CBT to no psychotherapeutic intervention. Similar to Tarrier and colleagues (2001), this intervention focused on coping with positive symptoms. Conversely to Sensky and colleagues (2000) and Tarrier and colleagues, Barrowclough and colleagues failed to find a significant improvement in negative or positive symptoms immediately after CBT, or 12 months later. The CBT condition showed a trend towards significant reductions in negative symptoms 12 months post-intervention.

Barrowclough and colleagues' (2006) CBT condition had similar proportions of males, average ages and duration of illness, and diagnosis to Tarrier and colleagues' (2001) CBT intervention. However, Barrowclough and colleagues' intervention was provided in group format. Perhaps the one-to-one contact in Tarrier and colleagues and Sensky and colleagues' (2000) studies was an element of therapy that improved negative symptoms. This hypothesis is supported by the significant improvements after individual supportive counselling and befriending. There was however significant improvements in routine care with no additional one-to-one intervention (Tarrier et al., 2001). This improvement was not replicated in another study (Barrowclough et al., 2006).

Similarly to the aforementioned RCT (Barrowclough et al., 2006) Temple and Ho (2005) found no significant improvement in negative symptoms after CBT was provided for people with schizophrenia and who had persistent positive symptoms in a routine clinical setting. Again, like Barrowclough and colleagues (2006), a trend towards significance was found. Temple and Ho's CBT was delivered on an individual basis. The intervention did show significant improvements in overall symptoms, delusions, and psychosocial functioning. The study sample was considerably small. Temple and Ho's CBT focused on reducing symptoms and improving adaptive functioning. Individual CBT has been found effective at reducing negative symptoms when the primary target of the intervention was to reduce positive symptoms only (Sensky et al., 2000; Tarrier et al., 2001).

A RCT conducted by Startup, Jackson, Evans, and Bendix (2005) studied the effectiveness of formulation-based CBT for individuals experiencing a variety of symptoms of psychosis and who were acutely unwell. They found that negative symptoms, positive symptoms, and social functioning significantly reduced after CBT compared to individuals receiving inpatient care only. When assessed two years later, the improvements in negative symptoms continued further, and social functioning improvements remained. These results indicate that individually tailored CBT improved negative symptoms in inpatients initially, and over time. Another RCT, conducted by Rector, Seeman, & Segal (2003), assessed the impact of manualised CBT, where specific modules were selected to alleviate different psychosis symptoms as required. Both the CBT condition and control group received 'enhanced treatment as usual' (ETAU) comprising of psychiatric reviews, psychoeducation groups, home-based outreach services, and access to occupational therapies. Both the CBT condition and ETAU condition led to significant reductions in negative and positive symptoms. Although there were no significant differences between conditions following

treatment, the CBT group's negative symptoms decreased further six months following treatment, and the ETAU group's did not, producing a significant difference at follow-up. These findings suggest that, similarly to Startup and colleagues' intervention, the effects of individual CBT are durable and may even improve beyond the sessions. This may perhaps be due to CBT techniques being applied in daily living situations.

In a routine clinical setting, a case study showed that alogia, avolition/apathy, and anhedonia, were reduced following CBT that initially focused on negative symptoms and engagement, then delusions (Serruya & Grant, 2009). Although clinically encouraging, no statistical analysis was conducted and, therefore, it is difficult to compare the results to other studies.

Turkington and colleagues (2006) evaluated technique-based individual CBT for schizophrenia, and therefore the mental health nurses conducting the therapy used an array of CBT techniques to treat presenting difficulties the participants had, rather than the intervention being formulation-driven (Startup et al 2005). CBT aimed to manage positive and negative symptoms, whilst improving medication compliance, beliefs about themselves and others, and preventing relapse. Twelve months following therapy, CBT showed significant improvements in negative symptoms and insight, compared to a 'usual treatment'. Positive symptoms did not significantly differ between conditions at follow-up. Unfortunately negative symptoms, and therefore any post-intervention changes, were not reported in the original publication (Turkington, Kingdon, & Turner, 2002). Additional to the individual therapy for people with schizophrenia, their main carers were given three sessions of CBT to aid their understanding of the intervention. This additional support beyond the sessions may have affected the outcome, and therefore conclusions cannot be made about the individual CBT.

Warman, Grant, Sullivan, Caroff, and Beck's (2005) study in a clinical setting combined individual and group-based CBT by alternating formats weekly. Similarly to Sensky and colleagues (2000), this CBT addressed psychosis symptoms, anxiety and depression. The small sample showed significant reductions in total negative and positive symptoms, although hallucinations did not significantly reduce. Depression and anxiety also decreased significantly. However, the improvements in negative symptoms were lost at an eleven-month follow-up assessment. This may have been due to the sample size, or using a group format. The lack of a control group makes it difficult to consider what changes were due to CBT or other environmental, biological, or psychiatric treatment factors. None-the-less the findings suggest that when individual and group CBT is used in a clinical setting it can reduce negative symptoms in the short-term.

CBT focusing on daily functioning

Two studies evaluated group-based CBT for improving social skills through communication and problem-solving training (Amell & Llandrich, 2008; Granholm et al., 2005). The former study significantly reduced negative symptoms, whereas the latter did not (Granholm, Auslander, Gottlieb, McQuaid, & McClure, 2006). Interestingly, the participants in the Amell and Llandrich's (2008) trial had four less sessions than Granholm and colleagues' (2005) sample. The CBT sample in Granholm and colleagues' study were much older (54.5 years compared to 27.7 years), and consequently the length of illness was longer (26.4 years compared to 8.25 years), which may suggest that CBT for social skills may be more effective if applied earlier in the illness or with younger individuals. Individuals with schizoaffective disorder were included in Granholm and colleagues' (2005) sample, which

may account for varying results between the two studies. Granholm and colleagues (2006) found that in their sample increased cognitive insight following CBT was significantly associated with reductions in negative and positive symptoms, but not with improvements in psychosocial functioning or depression. Greater participation in sessions was significantly correlated with negative and positive symptom improvements.

Gumley and colleagues' (2003) RCT explored the impact of individual CBT in reducing relapse. This intervention was unique because, following some engagement sessions, it was initiated when relapse was indicated, and terminated when the risk of relapse decreased. Following CBT, there was a significant reduction in negative and positive symptoms, and hospital admissions, compared to 'treatment as usual'. Unfortunately there was a lack of comparable interventions that were initiated at the early signs of relapse. However, Tarrier and colleagues (2001) also achieved reductions in negative symptoms when their CBT aimed to reduce relapse rates alongside positive symptoms. It can be concluded from Gumley and colleagues' research that CBT was more effective at reducing negative symptoms in the time preceding potential relapses than no intervention.

Knight, Wykes, and Hayward (2006) investigated the effectiveness of group-based CBT that aimed to improve self-esteem, coping skills, and self-efficacy. The waiting list control design showed no significant changes in negative or positive symptoms across the baseline period, but demonstrated significant improvements in negative and positive symptoms, depression and self esteem after CBT. Whilst these results are encouraging, this group intervention has only been proven successful for a small sample of inpatients and outpatients, and therefore replication of this study on a greater scale is required.

Summary for CBT Interventions

Nine out of 14 studies that provided outcome data showed CBT effectively reduced overall negative symptoms. Although Amell and Llandrich (2008) did not measure overall negative symptoms, they did find significant reductions in emotional withdrawal, social withdrawal and lack of spontaneity. Perhaps the findings of Johns and colleagues (2002) were an anomaly, as whilst they found significant reductions in avolition/apathy, which they were targeting, overall negative symptoms did not significantly reduce. The sample was extremely small (n=4), and therefore, may not represent the potential of the intervention or population.

Only three studies found that no negative symptoms reduced significantly following CBT (Barrowclough et al., 2006; Granholm et al., 2006; Temple & Ho, 2005), and two of these observed a trend towards significance (Barrowclough et al., 2006; Temple & Ho, 2005). One targeted social skills (Granholm et al., 2006), while two focused on reducing persistent positive symptoms. One hypothesis about the lack of significant improvements in negative symptoms in Barrowclough and colleagues'(2006) and Temple and Ho's (2005) studies may be that selecting participants with severe positive symptoms led to a tendency to concentrate on these symptoms, thus neglecting negative symptoms. Another possibility may be that the improvements in negative symptoms may have occurred secondary to improvements in positive symptoms, and thus represent changes in secondary negative symptoms (King, 1998). In support of this hypothesis, Sensky and colleagues (2000) and Tarrier and colleagues (2001) found significant reductions in positive and negative symptoms. Barrowclough and colleagues found neither improvement in positive or negative symptoms, and Temple and Ho found improvements in only some positive symptoms and no negative symptoms. These findings would be in line with the theory that negative symptoms may be a consequence of perceived stigma relating to positive symptoms (e.g. Strauss et al., 1989), and therefore as

positive symptoms reduce, perceived stigma reduces, and negative symptoms improve. However in contrast to this, Turkington and colleagues (2008) and Turkington and colleagues (2006) found that negative symptoms reduced following CBT, whilst positive symptoms did not. These findings are more in line with theories suggesting negative symptoms are caused independently of positive symptoms. Perhaps like Meehl (1962) suggested, they are due to an inability to relate to others, and through interactions in therapy, these symptoms have improved.

Improvements to specific negative symptoms were documented in five studies. These were avolition and apathy (Serruya & Grant, 2009; Johns et al, 2002; Turkington et al., 2006), emotional withdrawal, social withdrawal, and lack of spontaneity (Amell & Llandrich, 2008), and alogia, anhedonia, and asociality (Tarrier et al., 2001). Emotional withdrawal and social withdrawal improvements were not maintained at a six-month follow-up (Amell & Llandrich, 2008). Improvements in avolition and apathy however were maintained at six-month follow-up (Serruya & Grant, 2008) and 12-month follow-up (Turkington et al., 2006). Serruya and Grant (2008) found that although alogia, anhedonia and asociality did not improve immediate after CBT, they could improve six months after therapy. Tarrier and colleagues (2001) found a trend towards a significant improvement in alogia, compared to supportive counselling, although the absence of within group analysis causes difficulty in comparing these results to other studies. Therefore, it seems that CBT can reduce emotional and social withdrawal in the short term, and can improve motivation, engagement and pleasure and interest in activities and relationships. Further research identifying changes in specific symptoms is required.

The majority of the effective studies evaluated individual CBT that was either formulation-based, or manualised. Out of the three ineffective studies, two assessed group interventions (Barrowclough et al., 2006; Granholm et al., 2005), suggesting that individual

CBT is more effective than group CBT. This concurs with Granholm and colleagues' (2006) observation that greater participation significantly correlated with negative and positive symptom improvements. If participation is key to improvements, this may also partially explain the effectiveness of individual significant improvements in negative symptoms following individual befriending (Sensky et al, 2000) and supportive counselling (Tarrier et al., 2001). However, it is questionable whether participation in sessions would cause improvements in symptoms to be maintained five years later (Turkington et al., 2008). Perhaps a consequence of participation is learning techniques, activating the prefrontal cortex and reducing stigma, as suggested by Turkington and colleagues (2008). The only successful group interventions (Amell & Llandrich et al., 2008; Knight et al., 2006) focused on difficulties that could be considered to be more dependent on social interactions, namely social skills and self-esteem.

Ten studies documented follow-up data, ranging from 18 weeks to five years. Barrowclough and colleagues (2006) did not find a significant reduction in negative symptoms post intervention or six months later. Three studies showed reductions in negative symptoms immediately after CBT but elevations during their follow-up period of approximately six months (Amell & Llandrich, 2008), eleven months (Warman et al., 2005), and twelve months (Tarrier et al., 1999). Therefore, group CBT (Amell & Llandrich, 2008); combined individual and group CBT (Warman et al., 2005); and individual CBT (Tarrier et al., 1999) failed to show durable effects in relation to negative symptoms. A shorter follow-up period showed improvements in negative symptoms had been maintained for six weeks (Knight et al, 2006). Three RCT studies remarkably found even further improvements in negative symptoms following individual CBT sessions at 9 months (Sensky et al., 2000), 12 months (Rector et al., 2003) and 24 months (Startup et al., 2003). Impressively, improvements

were still found five years after baseline in Sensky and colleague's study (Turkington et al., 2008). Although Turkington and colleagues (2006) did not report within subject changes, their follow-up assessment showed that the CBT condition still had significantly less negative symptoms than the control condition approximately 10 months after CBT. This suggests that individual CBT can produce durable reductions in negative symptoms, for up to five years.

Only one study (Serruya & Grant, 2009) investigated CBT with an individual who had had symptoms for only one year. Other studies of CBT interventions for first-episode psychosis were excluded due to including individuals with mood disorders (Jackson et al., 2008; Lecomte et al., 2008). Therefore further research into the effectiveness of CBT with individuals with recent-onset psychoses is advised. Granholm and colleagues (2005) documented the oldest mean age of 54.2 years, and this study did not show significant changes in negative symptoms after CBT. Whilst, age has been found not to be associated with the level of negative symptoms (Schultz et al., 1997), if we consider Strauss and colleagues (1974; 1989) theory that negative symptoms may result from social stigmatisation, it may be that older individuals have experienced stigma for longer, and thus have had negative symptoms for longer, which then may be harder to alleviate.

It seems unlikely that gender differences can account for all variance in results. Whilst males have been found to have a poorer outcome compared to females (Leung & Chue, 2000), men participated in all CBT studies, including all of the effective studies. Two studies whose entire samples were male also found CBT to be effective at reducing negative symptoms (Johns et al., 2002; Warman et al., 2005).

Methodological differences between studies may also account for some variation in results. Four studies (Johns et al, 2008; Knight et al., 2006; Warman et al., 2005; Temple &

Ho, 2005) did not mention any form of treatment adherence measures, which make it difficult to conclude that individuals received the interventions described in the articles. Blinding at assessment was not possible in three studies, due to being a case study (Serruya & Grant, 2009), a waiting list control (Knight et al, 2006), and one experimental group only (Johns et al, 2008). One consistent procedure within the methodology was that all individuals were randomly assigned to CBT or control conditions, where control groups were included, thus eliminating prejudiced selection for specific treatment conditions.

In sum, CBT has been effective at reducing negative symptoms in outpatients, inpatients, and acutely unwell inpatients, and in participants with elevated positive symptoms, no positive symptoms, or elevated negative symptoms thus far. CBT has also been found to be effective for schizophrenia and schizoaffective disorder; with males and females; and with adults aged 25 (Serruya & Grant, 2009) and 48.83 years (Warman et al., 2005). Whilst group CBT has been successful at reducing negative symptoms (Amell & Llandrich, 2008; Knight et al., 2006), it has also been unsuccessful (Barrowclough et al., 2006; Temple & Ho, 2005). Negative symptom improvements have been more consistently evidenced following individual CBT, which has been formulation based (e.g. Startup et al., 2005) or manualised (e.g. Rector et al., 2003). The majority of studies excluded individuals with brain injuries, or who misused substances. This may have been an attempt to eliminate some complexities, especially as associations between substance use and psychosis symptoms remain inconclusive (Dixon, Haas, Weiden, Sweeney, & Frances, 1990; 1991; Salyers & Mueser, 2001). However, as lifetime prevalence rates for substance abuse in schizophrenia have been found to be as high as 47% to 59.8% (Fowler, Carr, Carter, & Lewin, 1998; Regier et al.,

1990) it seems important to include individuals who misuse substances in future research, in order to test the effectiveness of CBT in a 'representative' clinical sample.

Family Interventions

The NICE guidelines for schizophrenia (NICE, 2009) recommend that family interventions should be provided for people with schizophrenia if they are in close contact with their families. There is no specific mention of negative symptoms being the target of such family interventions.

Certain aetiology theories of negative symptoms in psychosis fit with the involvement of families in treatment. If Strauss and colleagues' (1974; 1989) theory that negative symptoms are seen as a consequence of social stigma is accurate, then perhaps increasing other people's empathy, understanding and involvement may reduce some perceived stigma, and accordingly to the theory, this may reduce negative symptoms.

Two studies evaluated multi-family group-based interventions that facilitated problem-solving in families (Bradley et al., 2006; Dyck et al., 2000). All participants were non-acute outpatients with schizophrenia or schizoaffective disorder. Both interventions had lasted 12 months when published. Bradley and colleagues' (2006) intervention had concluded, whilst Dyck and colleagues (2000) were half way through a two-year intervention. Participants were similar ages across the studies (33.6 years and 33 years respectively). However, the research is not comparable. Bradley and colleagues engaged individuals with schizophrenia and a relative in three sessions, before joining other families in two psychoeducation sessions about difficulties. Families then attended bi-weekly, multi-family, problem-solving meetings for twelve months. There was no significant change to negative

symptoms at the end of the 12 months, or at an 18-month follow-up. Similarly, Dyck and colleagues' family members attended group psychoeducation sessions, but these occurred without the patient. Again, families and patients then attended bi-weekly, multi-family, problem solving sessions. Dyck and colleagues' intervention did significantly reduce negative symptoms, specifically avolition and asociality, compared to those receiving standard care. It was the negative symptoms involving socialisation with others, therefore, that improved. Unfortunately Bradley and colleagues did not report any findings for specific negative symptoms.

Seventy two percent of Dyck and colleagues' (2000) sample were male, whilst only 28% of Bradley's sample was male. It is the study with the greater proportion of males, therefore, that showed significant improvements in negative symptoms, despite male gender being associated with greater negative symptoms and poorer outcome (Leung & Chue, 2000). Ninety four percent of Dyck and colleagues' sample were white. Bradley and colleagues' (2006) sample included 52% who were English speaking, and 48% who were Vietnamese speaking. The ethnic composition may account for some difference, but no evidence was found detailing the prognoses of American (Dyck et al, 2000), Australian, and Vietnamese (Bradley et al., 2006) people with psychosis.

Summary of Family Interventions

As only two family interventions were identified, limited conclusions can be made regarding the impact of family interventions in reducing negative symptoms. With regards to methodology, both studies used manualised interventions. However, whilst Dyck and colleagues (2000) observed videotapes of sessions to check fidelity, Bradley and colleagues

(2006) did not formally assess fidelity. Both studies included individuals who misused substances. These individuals were not differentiated in analyses and therefore the influence of these substances on therapeutic outcomes was not assessed. The durability of the treatment also remains questionable, as no significant reduction in negative symptoms was found after 18 months (Bradley et al., 2006), and Dyck and colleagues' participants were still receiving their intervention.

Several studies assessing family interventions were eliminated from this review due to including additional individual therapies (e.g. Grawe, Falloon, Widen, & Skogvoll, 2006). Further studies were excluded due to not directly measuring negative symptoms (Berglund, Vahlne, & Edman, 2003; Leff, Sharply, Chisholm, Bell, & Gamble, 2001).

Dyck and colleagues (2000) and Bradley and colleagues (2006) in their studies covered an adult population age range from 18 years to 55 years. Hence it remains unclear whether similar findings would be made with an older population. Family interventions with individuals who are acutely unwell and who are not receiving any other therapeutic intervention also need to be studied.

Cognitive Remediation Therapy

It has been suggested that cognitive deficits found in psychosis increase with every episode of psychosis, and whilst they may convalesce somewhat as other symptoms diminish, some impairments remain (e.g. Wykes & Reader, 2005). Cognitive deficits have been consistently associated with the presence of negative symptoms (Harvey, Koren, Reichenberg, & Bowie, 2006; Heydebrand et al., 2004; Johnson-Selfridge & Zalewski, 2001). CRT aims to

train individuals in cognitive skills, which are said to be impaired, through repetition and skill acquisition techniques. Reflection and metacognition aims to adapt the skills to real life settings (Wykes & Reeder, 2005). Six studies were identified that described the impact of CRT on negative symptoms in psychosis. Five of these produced a favourable outcome and one did not.

With regards to RCTs, Wykes and colleagues (2007) evaluated individual CRT that aimed to improve working memory, cognitive flexibility, and planning, for people with schizophrenia and social difficulties. Alongside significant improvements in working memory, there was a reduction in negative symptoms following CRT, compared to 'usual treatment'. Although statistical analyses for negative symptoms were not present in the original paper (Wykes et al., 2007), negative symptoms were analysed in a later publication (Wykes et al., 2009), which showed that the 'younger cohort' of 17 to 39 year olds, showed significant improvements in negative symptoms following CRT, but the 'older cohort' of 40 to 62 year olds did not.

A more recent RCT compared computerised CRT for attention, memory and cognitive problems, plus group-based social cognitive skills training, to 'enriched supportive therapy' for individuals with schizophrenia or schizoaffective disorder (Eack et al., 2009). The enriched supportive therapy included individual sessions focusing on illness and stress management. CRT significantly reduced negative symptoms, compared to the enriched supportive therapy at one year. CRT also improved neurocognitive functioning, anxiety and depression. These improvements were maintained after two years. These results suggest that components of the ETAU were not as effective at reducing negative symptoms as CRT. However, it remains unclear what the 'active' component of CRT was. It could be the number of sessions of CRT, as it was noted that this was not matched across the two interventions.

Alternatively, repetition of tasks in CRT may facilitate skill acquisition, and potentially reduce negative symptoms by possibly increasing pleasure or motivation. The CRT in this study differed from Wykes and colleagues' (2007) RCT as it included social cognitive skill CRT and memory CRT. Eack and colleagues (2009) also used computer programs to deliver CRT.

Bellucci, Glaberman, and Haslam (2003) similarly assessed computer-assisted CRT for outpatients with schizophrenia or schizoaffective disorder. Using the wait-list control method, they found that after CRT for attention and memory there were significant improvements in negative symptoms, verbal memory, and attention, compared to controls. Specifically, anhedonia, affective flattening and attention impairments significantly reduced. The CRT appeared to be similar to Eack and colleagues' (2009) but without the social cognitive skills sessions, and yet it still showed improvements in negative symptoms. Perhaps this suggests the memory CRT was, at least in part, responsible for these improvements in both studies.

Bark and colleagues (2003) assessed CRT with inpatients with schizophrenia or schizoaffective disorder, and who had problem solving and memory difficulties. Overall, the CRT conditions showed significant reductions in negative and positive symptoms compared to the control group, and improvements were maintained four weeks after therapy. When CRT was divided into problem-solving or memory CRT, the problem-solving CRT group demonstrated significant improvements in negative symptoms and the memory CRT group did not. This result seems contradictory to the significant improvements found in Eack and colleagues' (2009) and Bellucci and colleagues' (2003) studies following CRT for memory and attention. Bark and colleagues' CRT was 10 sessions long, and was for inpatients, whilst Bellucci and colleagues, and Eack and colleagues worked with outpatients for 16 and an

extensive 60 sessions of CRT for memory respectively, which may have contributed to their effectiveness at reducing negative symptoms.

Penadés and colleagues (2002) conducted CRT for social perception, attention and conceptual skills, with a small sample of outpatients with schizophrenia characterised by negative symptoms and cognitive deficits. Again, this CRT intervention significantly improved negative symptoms, and verbal memory, as well as associative learning, abstraction and executive functions. Unfortunately the study did not include a control group, thus making validation of CRT effectiveness difficult.

The one study that did not show a significant decrease in negative symptoms following CRT was an RCT with inpatients who had schizophrenia by Vauth and colleagues (2005). Three interventions were compared, namely group-based computer-assisted CRT for verbal memory and planning; a group-based intervention focusing on skills to manage negative symptoms, and controls receiving no group intervention. Negative symptoms reduced slightly, but not significantly within or between the three groups. These participants had milder negative symptoms at baseline than other studies, with means across the three groups ranging from 8.7 to 10.4 on the Positive and Negative Syndrome Scale (PANSS; Kay, Fiszbein, & Opler, 1987). Other, effective, CRT studies presented mean total negative symptoms at baseline as 18.6 (Wykes et al., 2007), 19.9 (Bark et al., 2003), and 23.25 (Penadés et al., 2002) using the PANSS. Perhaps CRT is more effective at improving severe negative symptoms. Drop-out rates within Vauth and colleagues' study were high, and the authors did not report whether negative symptoms differed between those who dropped out and those who remained in the study. Whilst the majority of research was conducted with outpatients, Vauth and colleagues' study was conducted with inpatients. However, Bark and colleagues' (2003) smaller study was also conducted with inpatients, and produced favourable

results. This tentatively contraindicates setting as accounting for the different outcome in Vauth and colleagues' study.

Summary of CRT

A tentative deduction from the studies reviewed is that CRT may be effective at reducing negative symptoms in people with schizophrenia and schizoaffective disorder who have severe negative symptoms before therapy. Mental healthcare setting, gender, or diagnosis, may not affect the impact of the therapy. Wykes and colleagues (2009) found that the older cohort in their sample did not show significant improvements in negative symptoms following CRT, but the younger cohort did. However Vauth and colleagues (2005) study had the second lowest mean age and found no significant benefit of CRT for negative symptoms. Therefore the relationship between age and the effectiveness of CRT remains unclear, and requires further research. Improvements to specific negative symptoms were only mentioned in one study (Bellucci et al., 2003), where anhedonia and flattened affect significantly improved following CRT. The durability of CRT interventions to reduce negative symptoms was only assessed by Bark and colleagues (2003), who found improvements in total negative symptoms were maintained four weeks after intervention.

The three most recent studies were RCTs, whilst the earlier three took place in clinical settings. All studies randomly allocated participants to groups, with the exception of Penadés and colleagues (2002) who only had a CRT group. Vauth and colleagues (2005) stratified their participants by typical or atypical antipsychotic medication regimes, and three studies found no difference in medication between their CRT participants and control participants. Eack and colleagues (2009) did not mention medication and, therefore, it cannot be ruled out

that different medications did not affect symptoms across conditions. This was also the only study where assessors were not blind to treatment, and therefore this may have biased their results. Noticeably, the assessors in Penadés and colleagues' study also knew that all participants received CRT. Treatment fidelity was checked within Wykes and colleagues study through observations and participants' paper exercises. No other papers discussed fidelity checks, although Eack and colleagues documented that clinical supervision occurred. Three interventions were wholly, or partly, computer-based CRT, and therefore the variability of therapy was limited by the flexibility of the software (Bark et al., 2003; Bellucci et al., 2002; Vauth et al., 2005).

Some studies were omitted from the review due to a lack of negative symptom measurements, or analysis of said measurements (e.g. Blairy et al., 2008; Kurtz, Seltzer, Fujimoto, Shagan, & Wexler, 2009). Therefore, whilst there is a vast amount of research regarding the effectiveness of CRT on cognitive abilities (e.g. Kurtz, Seltzer, Shagan, Thime, & Wexler, 2007; van der Gaag, Kern, van den Bosch, & Liberman, 2002) the effect of CRT on negative symptoms is in its infancy.

The reviewed research included individuals who had had a diagnosis of psychosis for six months (Bellucci et al., 2003) or longer. Research into the effectiveness of CRT with people at different stages of psychosis, such as close to onset, should be pursued.

Body-Oriented Psychological Therapy

Body-oriented psychological therapy (BPT), or 'body psychotherapy', has origins in psychoanalytic psychotherapy (Staunton, 2002). The premise is that it goes beyond the

language barriers often found in individuals with mental health difficulties. Individuals use movement to become refocused on their bodies, and to be informed of reality from this connection. The supposition to this theory is that by reconnecting with the realities of their bodies, individuals will also reconnect with their emotions (Röhricht & Priebe, 2006).

Two papers were found detailing the same pilot RCT of group-based manualised BPT with individuals with schizophrenia and severe negative symptoms (Röhricht, Papadopoulos, Suzuki, & Priebe, 2009; Röhricht & Priebe, 2006). The BPT group showed significantly lower negative symptoms post therapy compared to 21 people who received supportive counselling. Specifically, blunted affect and motor retardation were found to have reduced significantly following BPT. These improvements remained four months later. In further analysis, increased body demarcation predicted decreases in negative symptoms, whilst egopathology and body orientation were not predictive of change (Röhricht et al., 2009). There were no significant differences in demographic variables or antipsychotic medications between conditions, and therefore differences between results were likely to be due to the intervention. BPT was manualised, which can help to minimise differences between the treatments received. The supportive counselling, however, was not reported to be manualised, and neither treatment was documented to be evaluated for treatment fidelity.

In sum, all that can be concluded currently is that BPT is more effective than supportive counselling at reducing blunted affect and motor retardation in a small group of male and female outpatients with schizophrenia and severe negative symptoms at baseline. Inpatients, those with less negative symptoms, people in early stages of psychosis, those with other types of psychosis, and individuals older than 55 years are currently unstudied. The results from this RCT suggest that improvements to negative symptoms stayed until at least four months after BPT was complete. However, if this intervention is to be compared to CBT,

where total negative symptoms have been improved for up to nearly five years, further follow-up assessments of BPT is required.

Discussion

Clinical Implications

The research reviewed suggests that there are psychological therapies that can improve negative symptoms in psychosis. Only four out of 26 studies failed to find a significant reduction in negative symptoms following a psychological intervention, and two of these found trends towards significance (i.e. Barrowclough et al., 2006; Temple & Ho, 2005). Whilst there is a publication bias against studies that do not find significant results, especially if these include small samples (Geddes, Freemantle, Harrison, & Bebbington, 2000) the proportion of effective studies compared to ineffective studies are encouraging. All but one RCT (Barrowclough et al., 2006) found negative symptoms diminished following psychological interventions. There is a need for a family intervention RCT to clarify the findings of the two clinical studies (Bradley et al., 2006; Dyck et al., 2000).

CBT has the most evidence for reducing negative symptoms. CBT also improved the broadest range of negative symptoms, including alogia, anhedonia and asociality (Tarrier et al., 2001), social and emotional withdrawal (Amell & Llandrich, 2008) and avolition (Serruya & Grant, 2002; Johns et al., 2002). BPT led to improvements in flattened affect and motor retardation. Improvements in anhedonia, inattention and flattened affect were found following CRT, and family interventions produced decreases in avolition and asociality. CBT reduced avolition in some studies. BPT and CRT reduced negative symptoms when baseline negative

symptoms were severe, while CBT and family interventions proved to reduce negative symptoms irrespective of severity before therapy. These observations suggest that a variety of therapies, or techniques from these therapies, may be required to produce improvements in all negative symptoms. It also suggests different therapies may be more suitable for individuals with different symptoms. The evidence emphasises the importance of experienced clinicians who are able to correctly identify specific symptoms, and should direct professionals towards either individualised formulation-driven care (e.g. Startup et al., 2005) and/or manualised-based intervention with proven effectiveness (e.g. Dyck et al., 2000; Rector et al., 2003; Röhricht & Priebe, 2006).

The effectiveness of group-based interventions appears more variable than individual therapy. Two out of five CBT group interventions (Barrowclough et al., 2006; Granholm et al., 2006), and one out of two multi-family interventions (Bradley et al., 2006) failed to show improvements in negative symptoms. However, group therapy proved successful when deficits reflected social difficulties, such as problems with social skills (Amell & Llanrich, 2008) and low self-esteem (Knight et al., 2006). No group intervention was found to be superior in reducing negative symptoms than individual therapy, although some therapies, such as BPT and CBT for self-esteem, only occurred in group format.

The durability of family interventions was only assessed in one study, where no improvements in negative symptoms were found post therapy or six months later (Bradley et al., 2006). All other interventions found improvements could be maintained for different periods. CRT and BPT showed their improvements to be maintained four weeks after intervention (Bark et al., 2003; Röhricht & Priebe, 2006). The durability of CBT ranged from six weeks (Knight et al., 2006) to five years (Turkington et al., 2008). Conversely, some CBT studies found that improvements were lost between six (Amell & Llandrich, 2008) and 12

months (Tarrier et al., 1999) after intervention. This suggests CBT would be a superior therapy for the long-term treatment of negative symptoms, but also highlights some need for follow-up observation or 'booster' intervention sessions during the 6-12 month period post-intervention. The quantity of positive findings regarding CBT for negative symptoms may also reflect the advanced nature of the CBT research compared to the other, less studied interventions.

Whilst the research reviewed suggest psychological therapies can reduce negative symptoms, Birchwood and Trower (2006) raised the point, with reference to CBT for psychosis, that perhaps the role of psychological therapies should be to reduce distress. They argue that if neuroleptic medication is used to reduce symptoms, psychological therapies should concentrate on treating the person's emotional responses, which in principle would mean more holistic improvements could occur, rather than both medication and psychological therapies only targeting symptoms.

Research Implications

All of the research used different interventions and different methods to assess them. The therapists professions, experience, and training differed, as did the mental health settings. A variety of assessment tools were used to assess negative symptoms, although the common utilisation of the PANSS did allow some comparison of results. Antipsychotic medication may also have confounded some results.

The most consistent factor across the studies appeared to be the exclusion criteria. Almost all CBT studies excluded individuals with organic brain injuries or substance misuse.

Similarly, CRT studies tended to neglect individuals with IQs below 80 or substance misuse. Therefore, the impact of psychological therapies in reducing negative symptoms for these individuals is yet to be determined. This is particularly alarming with regards to substance abuse, due to high proportions of individuals with psychosis who misuse substances (Regier et al., 1990; Fowler et al., 1998). Family intervention studies included individuals who misused substances, but did not differentiate results for misusers and non-misusers (Bradley et al., 2006; Dyck et al., 2000). These studies showed inconsistent findings, and perhaps the effects of substance misuse confounded the results.

Many papers are starting to emerge that focus on integrative therapies, such as social skills groups for individuals whose families also attended psychoeducation (Valencia, Rascon, Juarez, & Murow, 2007), or individual and group CBT for patients and psychoeducation for families (Drury, Birchwood, & Cochrane, 2000). If it is accurate that different therapies alleviate different negative symptoms, a combination of psychological interventions may produce a broad range of improvements. However, therapeutic components of interventions have not been identified at present. Perhaps repetitions of some studies, with methodical changes to interventions need to be explored in order to comprehensively ascertain any therapeutic components that may produce positive outcomes.

The literature to date provides strong evidence that four different psychological therapies can improve negative symptoms in psychosis, and these improvements can be greater than those seen when such interventions are not included in people's mental health care.

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RESEARCH PAPER

NEGATIVE SYMPTOMS EXPERIENCED BY PEOPLE WITH SCHIZOPHRENIA AND SCHIZOAFFECTIVE DISORDER WHO USE CANNABIS:

A PILOT STUDY WITHIN ASSERTIVE OUTREACH SERVICES

Abstract

Background: Cannabis use has consistently been found to increase the risk of relapse, and decrease treatment compliance in people with schizophrenia. However, the effect of cannabis on positive and negative symptoms remains unclear, and is currently unstudied in an Assertive Outreach population.

Method: Thirty nine people with schizophrenia or schizoaffective disorder were recruited from four Assertive Outreach Teams. During an individual interview, information regarding current mental health, substance misuse, and substance dependence was collected.

Results: There was no significant difference between the severity of total negative symptoms, total positive symptoms, or specific negative symptoms, being experienced by cannabis users (n=16) and non-cannabis users (n=20). Surprisingly, a large proportion (65.0%) of the non-cannabis users used other substances, as did the cannabis users (87.5%).

Conclusion: The lack of association between cannabis use and negative symptoms differs from some research. The role of cannabis in symptoms being experienced by an Assertive Outreach population remains unclear due to three factors. The sample may have been too small to detect any differences. The history, particular the onset, of cannabis and other substance use may affect current symptoms. The third factor is that both groups were poly-substance users, which may impact on symptom presentation.

Keywords: Schizophrenia, schizoaffective disorder, negative symptoms, cannabis, substance use.

Introduction

Alcohol and drug use are widely recognised as problematic in those with mental health difficulties. The National Institute of Mental Health (NIMH) Epidemiologic Catchment Area study in the USA found that 47% of participants with schizophrenia or schizophreniform disorder also met the criteria for alcohol or substance abuse-dependence within their lifetime (Regier et al., 1990). Indeed, people with schizophrenia or schizophreniform disorder were 4.6 times more likely to have a substance misuse disorder compared to the general population. Similar lifetime prevalence (48.3%) has been reported in Sweden (Cantor-Graae, Norström, & McNeil, 2001) and Australia (59.8%) (Fowler, Carr, Carter, & Lewin, 1998). A more recent NIMH study reported 60% of their USA sample with schizophrenia used substances at the time of the trial, and 37% demonstrated a substance abuse disorder (Swartz et al., 2006). In the UK, 36.3% of an inner city community mental health sample of people with severe mental illness were found to have experienced problems relating to their substance use in the previous 12 months (Menezes et al., 1996). In Birmingham, UK, 24% of people diagnosed with a severe mental health problem experienced problematic substance use in the previous year. The majority had a diagnosis of schizophrenia, schizotypal or delusional disorders; and were male (Graham et al., 2001). In that study Assertive Outreach Teams (AOTs) had a significantly greater amount of individuals with a substance impairment/dependency on their caseload than substance misuse, primary care, and continuing care services. That is, 26 to 45% of all of the AOTs' caseloads. Younger age, lower levels of education and being male have been found to be associated with greater substance misuse in schizophrenia (Dixon, 1999; Salyers & Mueser, 2001). Alcohol dependence in schizophrenia has been associated with younger age, male gender, and use of other substances (Drake, Osher, & Wallach, 1989).

Effects of Substance Use on Psychosis

The impact of substances on psychosis symptoms remains unclear, due to varying research findings. For example, an early review of the literature indicated that the majority of studies found exacerbated psychotic symptoms in substance misusers with schizophrenia (Dixon, Haas, Weiden, Sweeney, & Frances, 1990). However, they also found that whilst opiates increased negative symptoms, amphetamines and benzodiazepines lowered them. Others have found lower levels of negative symptoms in substance misusers compared to non-users (Dixon, Haas, Weiden, Sweeney, & Frances, 1991; Salyers & Mueser, 2001). One study suggested that greater symptom severity increased people's motivation to use substances (Spencer, Castle, & Michie, 2002).

Substance misuse in psychosis has been associated with greater rates of rehospitalisation (Dixon et al., 1990; Drake et al., 1989; Gupta, Hendricks, Kenkel, Bhatia, & Haffke, 1996; Swofford, Kasckow, Scheller-Gilkey, & Inderbitzen, 1996), poorer quality of life (Addington & Addington, 1997), poorer interpersonal relationships (Salyers & Mueser, 2001), higher rates of suicide attempts (Gut-Fayand et al., 2001) and poorer medication compliance (Dixon, 1999; Drake et al., 1989; Owens, Fischer, Booth, & Cuffel, 1996). Substance use plus medication noncompliance has been associated with even greater symptoms (Owens et al., 1996), greater numbers of serious violent acts (Swartz et al., 1998), and faster readmission rates (Hunt, Bergen, & Bashir, 2002). In sum, it appears that substance misuse among those with psychosis may exacerbate some symptoms of psychosis, ameliorate others, and have a negative impact on the course and treatment of psychosis.

Cannabis Use Prevalence in Psychosis

In several countries, cannabis has been found to be the second most commonly used and misused substance by people with severe mental health problems, after alcohol (Cantor-Graae et al., 2001; Graham & Maslin, 2002; Fowler et al., 1998; Mueser et al., 2000). In the UK and USA the third most commonly used substance by those with psychosis is cocaine (Graham & Maslin, 2002; Mueser et al., 2000). In Australia, however, it was reported that alcohol, cannabis, and amphetamines were the most commonly used substances (Fowler et al., 1996). In a sample of first-episode psychosis, cannabis was found to be the most misused substance, more so than alcohol (Cantwell et al., 1999).

A recent review of cannabis use in psychosis calculated mean prevalence rates for current use, use in the previous twelve months, and lifetime use to be 23%, 29.2% and 42.1% accordingly. With regards to misuse, they reported 11.3% had misused in the last month, 18.8% in the last 12 months, and 42.1% in their lifetime (Green, Young, & Kavannagh, 2005). Within an urban area in the UK, 43% of people with a severe mental illness in Assertive Outreach settings were found to be misusing cannabis currently (Graham & Maslin, 2002). Of those with cannabis impairment-dependence, 81% had a diagnosis of schizophrenia, schizotypal or delusional disorder. Lifetime prevalence rates of cannabis use in first-episode psychosis were 60% in a Canadian sample (Archie et al., 2007) and 80.3% in a UK sample (Barnett et al., 2007). These studies indicate that a considerable number of individuals with psychosis use cannabis. It is, therefore, of clinical importance that the effects of cannabis on psychosis are explored, in order to improve the effectiveness and delivery of interventions addressing substance misuse, symptoms, and functioning in psychosis.

Effects of Cannabis in Psychosis

Cannabis use and relapses/rehospitalisations

Two studies have found that cannabis misuse during or preceding first hospitalisation is correlated with more, and earlier relapses, when compared to non-misusers (Caspari, 1999; Linszen, Dingemans, & Lenior, 1994). The quantity of cannabis use seems pertinent, as heavy use was indicative of more relapses (Linszen et al., 1994). A study of an early-onset sample concluded that cannabis use at first admission and 12 months later predicted greater relapses, treatment noncompliance, and increased stress (Martinez-Arevalo, Calcedo-Ordoñez, & Varo-Prieto, 1994). More recent first-episode psychosis studies similarly found that cannabis use reduced medication compliance (Coldham, Addington, & Addington, 2002) increased the number of relapses (Pencer, Addington, & Addington, 2005), and that psychotic relapses can then predict a return to cannabis use (Hides, Dawe, Kavanagh, & Young, 2006).

Cannabis and Positive Symptoms of Psychosis

'Psychosis' is often used to describe a group of psychotic disorders (DSM-IV-TR; American Psychiatric Association, 2000) including schizophrenia, schizoaffective disorder, delusional disorder, and specific psychotic disorders. It has been theorised that symptoms of schizophrenia may occur in two distinct clusters, namely positive symptoms and negative symptoms (e.g. Crow, 1980; Lewine, Fogg, & Meltzer, 1983). 'Positive symptoms' refers to symptoms that are additional to experiences in the general population, such as delusions, thought disorder, and hallucinations. 'Negative symptoms' tends to describe a loss of emotion or behaviour (e.g. Birchwood, Hallett, & Preston, 1989), such as blunted affect, decreased

motivation (avolition), reduced pleasure (anhedonia), or poverty of speech (alogia).

Some studies have found no significant correlation between positive symptoms of psychosis and cannabis misuse (e.g. Compton, Furman, & Kaslow, 2004; Dubertret, Bidard, Adès, & Gorwood, 2006). However, studies of early-onset psychosis have reported elevated positive symptoms in cannabis users (e.g. Addington & Addington, 2007; Grech, Van Os, Jones, Lewis, & Murray, 2005). Also, Caspari (1999) found that young individuals who misused cannabis prior to their first hospitalisation had significantly greater 'thought disturbance' and hostility than non-misusers two and five years following admission. Bersani, Orlandi, Kotzalidis, and Pancheri (2002), however, found in their sample of older males (mean age: 32.13 years) who had had psychosis for a mean duration of 10.31 years, that cannabis users experienced less thought disorder than nonusers. Interestingly, they also found that individuals whose schizophrenia preceded their cannabis use had significantly greater positive symptoms than those whose cannabis use preceded schizophrenia.

Cannabis and Negative Symptoms of Psychosis

Similar to positive symptoms, the profile of negative symptoms in individuals who use or misuse cannabis is not consistent across studies. Some studies found no significant difference between the negative symptoms experienced by cannabis users and non-users (Boydell et al., 2007; Grech et al., 2005) or misusers and non-misusers (Addington & Addington, 2007; Kovasnay et al., 1997) in individuals with first-episode psychosis. In contrast, Compton and colleagues (2004) found that their first-episode psychosis participants who were dependent on cannabis experienced significantly fewer negative symptoms than the non-dependent participants. Peralta and Cuesta (1992) found no significant difference in total

positive or negative symptoms between cannabis misusers and non-misusers in people under the age of 35 years with schizophrenia. However, they did find significantly less alogia in cannabis misusers than non-misusers. Two studies of "chronic" inpatients, who had had psychosis for an average of 9.61 years or more, found significantly fewer negative symptoms in cannabis users and misusers (Bersani et al., 2002; Dubertret et al., 2006), specifically avolition and apathy (Dubertret et al., 2006) and also affective flattening, alogia, anhedonia-asociality, and attention (Bersani et al., 2002). When other substance misuse was taken into account, Bersani and colleagues (2002) found that whilst polysubstance misusers experienced significantly less negative symptoms than the cannabis users, the cannabis users did not show less negative symptoms than the nonusers. In contrast to this, Dubertret and colleagues (2006) still found less avolition-apathy in the 'pure' cannabis misusing group compared to the non-misusing group. Batki, Leontieva, Dimmock, and Ploutz-Snyder (2008) discovered that negative symptoms in their outpatient sample were negatively correlated to frequency of cannabis use by people who had schizophrenia or schizoaffective disorder and alcohol dependence. They pinpointed less 'blunted affect', 'difficulty in abstract thinking' and 'lack of spontaneity and flow in conversation' on the Positive and Negative Syndrome Scale (PANSS; Kay, Fiszbein, & Opler, 1987) was associated with more days of cannabis use. They also found that when positive symptoms were greater than negative symptoms, this was associated with more days of cannabis use.

From the literature it seems that cannabis use has been associated with greater and more rapid relapse, and less compliance with treatment. Findings are fairly mixed with regards to positive symptoms, as some cannabis users have been found to experience greater positive symptoms, others have experienced less, and some have shown similar levels as non-misusers. In first-episode psychosis samples, no association between negative symptom

severity and cannabis use has been found. However, in samples not specifically in their first episode, fewer negative symptoms have been found in those using or misusing cannabis. It has been suggested that the chronology of schizophrenia and cannabis use may affect any interactions between negative symptoms and cannabis (e.g. Bersani et al., 2002).

The Impact of Negative Symptoms in Psychosis

Research suggesting that negative symptoms are associated with the course and prognosis of psychosis is reviewed below. In fact, it has been discovered that the greater the severity of negative symptoms, the longer the duration of psychosis (Breier, Schreiber, Dyer, & Picker, 1991). It is important to note, however, that no causal links have been established, and therefore it may be that negative symptoms affect prognosis and functioning, or those difficulties in functioning cause further negative symptoms.

Negative Symptoms and Depression

Depressive symptoms have been found to be greater in those with schizophrenia than in the general population (e.g. Zisook et al., 1999). In addition, those who use or misuse cannabis have been found to have even greater depression in schizophrenia (Cuffel & Chase, 1994; Scheller-Gilkey, Thomas, Woolwine, & Miller, 2002). Depression is likely, therefore, to be experienced alongside the symptoms of psychosis. Depression, especially 'postpsychotic depression', and negative symptoms may be confounded (Sommers, 1985). The majority of research has concluded that depression and negative symptoms are not correlated (e.g. Herbener & Harrow, 2001; Lysaker, Bell, Bioty, & Zito, 1995; Zisook et al., 1999).

Birchwood, Iqbal, Chadwick, and Trower (2000) found that depression that occurred within the psychotic stage of psychosis would decrease as psychosis remitted, but depression that occurred in the post psychotic phase of psychosis was not associated with positive or negative symptoms. Some researchers, however, have found that some depressive symptoms are positively correlated with negative symptoms, namely anhedonia/asociality and avolition/apathy (Sax et al., 1996). Kulhara and colleagues (1989) found that total depressive symptoms, lack of energy, and slowness correlated with negative symptoms whilst confirming other depressive symptoms such as somatic concern, anxiety, guilt, tension, and depressive affect, did not. It is essential that depressive and negative symptoms are differentiated as they require different treatments. For example, tricyclic antidepressant medication has been found to reduce depression in psychosis when used with neuroleptic medication, but they do not have any significant effect on reducing negative symptoms (Plasky, 1991). Also whilst Cognitive Behavioural Therapy is recommended for the treatment of depression (NICE, 2007), it is not specifically recommended for negative symptoms in schizophrenia (NICE, 2009).

Negative Symptoms and Functioning

Severe negative symptoms during psychosis have been associated with lower premorbid IQ levels (Brill et al., 2009), severe cognitive deficits (Harvey, Koren, Reichenberg, & Bowie, 2006) and a longer lifetime duration of hospitalisation (Pogue-Geile & Harrow, 1984). Negative symptoms have also been linked to difficulties with daily functioning. Poorer overall functioning at the onset of the illness was associated with greater negative symptoms between two and eight years into the course of illness (Siegel et al., 2006).

Similarly, when individuals' functioning was assessed one year prior to initial hospitalisation for psychosis, lower premorbid functioning was associated with greater negative symptoms, which consequently then predicted poorer postmorbid functioning (Brill et al, 2009; Pogue-Geile & Harrow, 1984).

Greater severity of current negative symptoms have been associated with poorer social functioning (Bowie, Reichenberg, Patterson, Heaton, & Harvey, 2006; Breier et al., 1991; Brill et al., 2009; Hwu, Tan, Chen, & Yeh, 1995; Pogue-Geile & Harrow, 1984); poorer work functioning (Breier et al., 1991; Brill et al., 2009; Pogue-Geile & Harrow, 1984); and reduced independent functioning (Breier et al., 1991). Bowie and colleagues (2006) found that whilst functional capacity was the most predictive factor for functional outcome, elevated negative symptoms reduced functional outcome even further. This suggests that whilst individuals' functioning can be affected by their abilities to know how to conduct a task, negative symptoms seem to exacerbate difficulties in performing those skills on a day-to-day basis.

Negative Symptoms and Assertive Outreach Teams

Engagement with mental health services has been proven more difficult for younger service-users, males, people from ethnic minorities, people with poorer social functioning, and substance users (Kreyenbuhl, Nossel, & Dixon, 2009). Assertive Outreach Teams (AOTs) have been established across the UK in order to provide mental health care for individuals with psychosis and other mental health difficulties that have disengaged from other services.

AOT service users in the UK have been shown to have higher levels of substance use than people being cared for by Community Mental Health Teams (CMHTs). For example, as

described previously, between 26 and 48% of all people being cared for by AOTs were dependent on substances (Graham et al., 2001; Commander, Sashidharan, Rana, & Ratnayake, 2005; Fakhoury et al., 2006; Schneider, Brandon, Woofe, Carpenter, & Paxton, 2006), compared to between 3% and 27% of CMHT service users (Carrà & Johnson, 2009; Schneider et al., 2006; Weaver et al., 2001). In one AOT sample, 84.8% of the individuals who were dependent on substances in the past six months fitted criteria for cannabis-abuse (Fakhoury et al., 2006).

AOT service users have been found to have more severe symptoms of mental illness, with 95% of individuals accessing AOTs in North East England being regarded as 'psychotic' by their care co-ordinators, compared to 31% and 45% in CMHTs (Schneider et al., 2006). They also found that almost 83% of individuals in AOTs were admitted to hospital at least once in a two-year period compared to 26% and 28% in two CMHTs, suggesting higher symptom levels and thus greater relapses. Ten percent of the AOT population demonstrated current self neglect, compared to eight percent in one CMHT and 4 percent in another (Schneider et al., 2006). In an audit of workload within an AOT, Wharne (2005) consistently found twelve problems that people experienced that required additional support from the AOT. These were: childhood relationships, substance misuse, financial crises, self harm, hospitalisation, difficulties with daily living skills, comorbid diagnoses, social exclusion, forensic issues, inactivity, housing issues, and untreated mental health problems. Wharne (2005) acknowledged that the majority of these difficulties may result in an escalation of symptoms, although no formal assessment of symptoms appeared to be included in the audit.

In sum, many individuals on AOT caseloads are experiencing problematic life events and a number are experiencing negative symptoms which impact on functioning and prognosis. Also, the increased use of substances by this group relative to CMHTs, and the

high proportion of substance-misusers showing cannabis dependence (Fakhoury et al., 2006) indicates that the effects of cannabis require further investigation in samples of AOT service users.

Aims of the Current Research

1) To ascertain whether people with schizophrenia, schizotypal or delusional disorders who are under the care of AOTs experience different negative symptoms when they are users of cannabis, compared to those who do not use cannabis.

2) To assess the extent to which depression and negative symptoms co-occur in those people who use cannabis and those who do not.

Accordingly the hypotheses were:

1) That individuals who have schizophrenia, schizotypal or delusional disorders and use cannabis would experience less severe negative symptoms than those who do not use cannabis.

2) That any difference between the severity of negative symptoms observed in participants who use cannabis compared to those who do not, would remain when depression had been controlled. Thus depression would not account for the differences.

Method

Design

A between-subject design was used to investigate any associations between negative symptoms, cannabis use and depression. A natural groups design meant that group assignment was ascertained depending on whether participants reported using cannabis or not. If participants had used cannabis at least once per week in the past 30 days, as measured by Section B of the Maudsley Addiction Profile (Marsden et al., 1998), they were allocated to the 'cannabis users' group, and if they had not used cannabis in the last 30 days, they were assigned to the 'non-cannabis users' group.

Participants

Participants were recruited from four out of eight AOTs within a large NHS Trust in Birmingham. Two teams were based within the inner city area, where high prevalence rates of substance misuse have been recorded in the past (Carrà & Johnson, 2009; Graham & Maslin, 2002). These two AOTs also covered geographical areas that had greater proportions of income, employment, education, and health deprivation compared to outer city areas in 2001 and 2004 (Cangiano, 2010). One of these two teams also covered an area with greater proportions of people from ethnic minority groups, such as 25.2% of the population being Pakistani, 18.7% Indian and 15.3% Black. The third team was based in an outer city area, which covered both affluent and deprived areas (Cangiano, 2010). The fourth team covered Solihull. Although their base was within the most deprived area of Solihull, overall Solihull is more affluent and less deprived than Birmingham, as only eight percent of Solihull falls within the 10th percentile of deprivation in the country, compared to 40% of Birmingham

(Solihull Metropolitan Borough Council, 2008). These teams were therefore thought to be representative of the diversity across the Birmingham and Solihull Area.

Inclusion criteria were that participants must have a diagnosis of a mental health problem in the F20-F29 schizophrenia, schizotypal and delusional disorder cluster defined in the ICD-10 (World Health Organization, 1993), as determined by the participant's psychiatrist. They must be on the caseload of an AOT. All participants needed to speak English. Exclusion criteria included being detained in a psychiatric hospital under a section of the Mental Health Act (2007), being acutely unwell, or being intoxicated at the time of interview. These criteria were in place to protect individuals who may not be able to give informed consent to participate.

Procedure

The research was approved by a local ethics committee and by the Research and Development department within the participating NHS Trust.

Potential participants were identified by the multidisciplinary team within each AOT. The potential participants were approached by a member of AOT staff with whom they were familiar, such as their care co-ordinators. Some individuals also discussed the research with the researcher if the participants wished to do so. Potential participants were provided with an outline of the research verbally and in written format. If the participants agreed to take part, an interview between the participant and researcher was arranged.

At the time of interview, a verbal description of the research was presented again to the participant, and each participant signed a consent form before the interview commenced. The interview took approximately one hour and consisted of standardised semi-structured interviews and questionnaires, dictated verbally by the researcher, that measured symptoms of psychosis, depression, and drug use. Individuals were assigned to 'cannabis users' or 'non-cannabis users' depending on self disclosure of cannabis use. The degree to which cannabis use was problematic was also assessed. Demographic information about participants was collected during the interview and from computerised data held by each team. Participants were given £5.00 to compensate them for their time, and any costs incurred in attending the interview.

Measures

Three standardised measures were used during all interviews. An additional measure was used during the cannabis users' interviews to assess problematic use of this substance. The measures used are listed below.

Negative & Positive Symptoms of Psychosis: The Structured Clinical Interview for the Positive and Negative Syndrome Scale (PANSS; Kay, Fiszbein, & Opler, 1987).

The PANSS is a structured interview that assesses the severity of positive symptoms, negative symptoms, the relationship between positive and negative symptoms, and general psychopathology. The symptoms are scored via verbal answers from the individual with psychosis and observations made by the interviewer. Additional information from

professionals and family members can also be integrated into the scores. There are seven positive symptom items, seven negative symptom items, and 16 general psychopathology subscales on the PANSS. Each symptom item is scored from one to seven, one being 'absent' and seven being 'extreme'. Therefore scores for positive and negative symptoms range from seven to 49; general psychopathology ranges from 16 to 112; and total PANSS score ranges from 30 to 210. Kay, Opler, and Fiszbein (1987) calculated t scores that corresponded to raw scores on each subscale. A total positive score of 20 corresponded to a t-score of 50, and therefore this was 'average' compared to a group of 240 medicated people with schizophrenia. A total negative score of 22, a positive minus negative score of -2, and a general psychopathology total of 40 were also deemed to be 'average'. Assessors must be experienced in working with individuals with psychosis, and additional training is required to use the PANSS. It was used in this research due to its previous use in cannabis and psychosis research (e.g. Addington & Addington, 2007; Batki et al., 2008; Bersani et al., 2002; Compton et al., 2004), which may aid comparison of data. The PANSS has been recommended for research use over the Brief Psychiatric Rating Scale (Bell, Milstein, Beam-Goulet, Lysaker, & Cicchetti, 1992).

The PANSS has good reliability, criterion-related validity, and predictive validity (Kay, Fiszbein et al., 1987). It has also been found to be sensitive to medication.

Depression: The Calgary Depression Scale (CDS; Addington, Addington, & Maticka-Tyndale, 1993).

This brief, nine item, scale is administered in interview format. It measures depressive symptoms that are separate to negative and extrapyramidal symptoms, in people with

psychosis (Addington, Addington, & Maticka-Tyndale, 1994). This sensitivity to negative symptoms was the reason the CDS was used in this study. Eight items measure verbal feedback from interviewees, whilst observations are made by the interviewer. The ninth item is an overall assessment of the interviewee's presentation. The greater the total score, out of 27, the greater the depressive symptoms. A score of 6 or above would indicate 85% sensitivity and 82% likelihood of a major depressive episode. The CDS has been found to have high inter-rater reliability (0.895) (Addington, Addington, Matilka-Tyndale, & Joyce, 1992).

Substance Use: The Maudsley Addiction Profile (MAP; Marsden et al., 1998).

The MAP was designed in the UK in order to assess alcohol and drug addictions. The questionnaire contains 60 items that assess four domains known to contribute to addictions to substances, which are substance use, health risk behaviour, physical and psychological health factors, and the individual's social functioning. It is presented in interview format. Within this research, only Section B was used. This section details substance use over the previous 30 days, and ascertains how many days the individual has used substances, how much they used on a typical day, and how they consumed the substance.

The MAP was originally designed as an outcome measure for addiction treatment, but is very appropriate as a research tool. It has high test-retest reliability (average of 0.94 across different substances), as well as being easily administered (Marsden et al., 1998).

The MAP was used in this research not only to assess quantity and frequency of cannabis use, but to also collect information about other substance use, which may have affected current psychosis symptoms.

Cannabis Dependence: The Severity of Dependence Scale (SDS; Gossop et al., 1995).

The SDS is a brief, five question measure that assesses a person's dependence on a particular substance, which is named before completion. The scale measures factors relating to substance dependency, such as perceived control over the use of the substance, preoccupation with use, and anxieties about substance-related behaviour.

Swift, Copeland, and Hall (1998) suggested a score of three or above on the SDS indicated cannabis dependence in the general population. However, Hides, Dawes, Young, and Kavanagh (2007) reported that individuals with psychosis who scored greater than or equal to a total score of two on the SDS were 28.6 times more likely than people with lower scores to meet the criteria for cannabis dependence in the DSM-IV. They found the SDS to have overall accuracy of 84.3%, and high internal consistency (0.81) when used to measure cannabis dependence. The SDS was used in the current study to identify whether individuals were likely to be dependent on cannabis at the time of the research. A score of two or above will be used to indicate an increased likelihood of cannabis dependence, due to similarities between the mental health diagnoses of the current sample and that of Hides and colleagues' sample.

Results

Data Analysis

In order to analyse the relationships between cannabis use, and different symptoms of psychosis the following statistical tests were executed. One way analyses of variance (ANOVAs) were used to compare the means of continuous demographic variables, such as age and duration of illness, in the cannabis users and non-cannabis users. Chi-square tests for independence were conducted to compare categorical variables, such as gender, ethnic background, and diagnosis between groups. One-way ANOVAs were subsequently used to compare the cannabis users' and non-cannabis users' mean total PANSS, total negative symptom subscale score, total positive symptoms, composite score, and the individual negative symptom scores. The same analysis was applied to compare the level of depression in each group, by comparing the means of the total on the CDS. An Analysis of covariance (ANCOVA) would have been appropriate to investigate the relationship between cannabis use and total negative symptoms, whilst controlling for the effects of depression. However, both of the two conditions required for an ANCOVA, namely that the covariate must be correlated with the dependent variable and the covariate must be disproportionately correlated to the independent variable, were violated in this study. Therefore an ANCOVA would have been obsolete.

Use of other substances by both the cannabis users and non-cannabis users was explored using descriptive statistics. Due to the small sample sizes, and the variance in sample sizes for specific drugs, no statistical analysis was appropriate.

Participants

Out of a total AOT caseload of 255 people across the four teams, 58 were excluded due to not speaking English, being acutely unwell or detained, or having a diagnosis other than schizophrenia, schizotypal or delusional disorder. Of the 186 eligible clients, 158 either declined to take part or were not approached due to teams' concerns about engagement. Thirty nine participants were recruited (19.80% of eligible participants). Data from three individuals who used cannabis was omitted from further analysis. Two were removed due to using only £2.00 worth of cannabis in 30 days, and therefore were neither non-cannabis users, nor cannabis users who used cannabis at least once a week. One other was removed as their data was deemed unreliable.

Of the 36 remaining participants, 83.3% were male, and the mean age of participants was 45.61 years, ranging from 27 to 73 years. Individuals had diagnoses of schizophrenia (86.1%) or schizoaffective disorder (13.9%). Demographics are described in Table 1.

There were no significant differences between the cannabis users and non-cannabis users in age ($F=1.590$, $p=0.375$) duration of illness ($F=0.061$, $p=0.807$) diagnoses ($X^2=1.536$, $p=0.215$) gender ($X^2=0.000$, $p=1.000$) or ethnic background ($X^2=3.413$, $p=0.332$). The age of nonusers included three outliers. However, there was no significant difference found between the age of the cannabis users and nonusers with these outlier included. Due to this non-significant difference, and taking the limited sample size into account, these outliers were included in all further analyses.

Tests of normality were run on continuous variables. Duration of illness was normally distributed for cannabis users (K-S=0.168, p=0.200) and non-cannabis users (K-S=0.119, p=0.200), and age was normally distributed for cannabis users (K-S=0.129, p=0.200) but not

for the age of non-cannabis users (K-S=0.235, p=0.005). Due to the latter finding, and the non-idealised normality of the other demographics, nonparametric tests were run on all demographics to ascertain whether further analysis would require parametric or nonparametric testing. These Kruskal-Wallis analyses also found no significant difference between groups on age (H=0.244, p=0.621) and duration of illness (H=0.004, p=0.949). Therefore the cannabis users and the non-cannabis users are comparable on the demographic variables of age, duration of illness, gender, and ethnic background. It was concluded that further analysis should continue using ANOVAs due to their more robust nature compared to the nonparametric test (Kruskal-Wallis), and because each dependent variable showed a normal distribution for the cannabis users and the non-cannabis users. Kruskal-Wallis results are documented for the comparison of individual negative symptom items, when these were found to violate normality.

Table 1

Characteristics of the sample

		Total (n= 36)	Cannabis Users (n= 16)	Non Users (n= 20)	P (sig)
Gender	Male	30 (83.3%)	13 (81.3%)	17 (85%)	1.000 (NS)
	Female	6 (16.7%)	3 (18.8%)	3 (15.0%)	
Age	Years (SD)	45.61 (10.40)	43.19 (8.44)	47.55 (11.58)	0.375 (NS)
	Age range in years	27 – 73	27 – 55	34 – 73	
Ethnicity	White	17 (47.2%)	7 (43.8%)	10 (50.0%)	0.332 (NS)
	Mixed	2 (5.6%)	1 (6.3%)	1 (5.0%)	
	Asian	3 (8.3%)	0 (0%)	3 (15%)	
	Black	14 (36.0%)	8 (50.0%)	6 (30.0%)	
Diagnosis	Schizophrenia	31 (86.1%)	12 (75.0%)	19 (95.0%)	0.215 (NS)
	Schizoaffective Disorder	5 (13.9%)	4 (25%)	1 (5%)	
Illness Duration	Months (SD)	220.86 (108.49)	215.81 (96.36)	224.90 (119.64)	0.807 (NS)
	Duration range in months	51 – 492	83 – 372	51 – 492	
PANSS	Positive symptom total (SD)	15.03 (4.37)	16.00 (4.10)	14.25 (4.53)	0.238 (NS)
	Negative symptom total(SD)	14.33 (4.99)	13.13 (2.99)	15.30 (6.05)	0.238 (NS)
	Positive - Negative (SD)	0.69 (6.30)	2.88 (4.02)	-1.05 (7.29)	0.049* (S)
	General (SD)	29.11 (6.19)	29.38 (7.36)	28.90 (5.27)	0.823 (NS)
	Total PANSS score (SD)	58.47 (11.95)	58.50 (12.20)	58.45 (12.06)	0.990 (NS)
	N1 Blunted Affect (SD)	1.31 (0.86)	1.31 (0.79)	1.30 (0.92)	0.787 (NS)
	N2 Emotion Withdraw (SD)	1.47 (1.00)	1.38 (0.81)	1.55 (1.15)	0.883 (NS)
	N3 Poor Rapport (SD)	1.83 (1.40)	1.69 (0.95)	1.95 (1.70)	0.738 (NS)
	N4 Social withdrawal (SD)	2.28 (1.47)	2.06 (1.39)	2.45 (1.54)	0.430 (NS)
	N5 Diff. abstract think (SD)	3.61 (1.71)	3.37 (1.50)	3.80 (1.88)	0.467 (NS)
	N6 Lack of spontaneity (SD)	2.08 (1.50)	1.56 (0.81)	2.50 (1.79)	0.136 (NS)
	N7 Stereotyped think (SD)	1.75 (1.16)	1.75 (1.07)	1.75 (1.25)	0.897 (NS)
CDS	Total (SD)	3.28 (3.44)	3.50 (3.81)	3.10 (3.19)	0.734 (NS)
	Range	0 – 13	0 – 13	0 – 13	

* Asymptotically F and corresponding p according to Welch and Brown-Forsythe test, due to lack of homogeneity on this variable

Psychosis Symptoms

Total severity of symptoms

There was no significant difference between the total PANSS scores for cannabis users and non-cannabis users (F=0.000, p=0.990). The entire range of symptoms measured by the PANSS was experienced by cannabis user group and the non-cannabis using group, except for two general scales. 'Motor retardation' and difficulties with 'Mannerisms and postering' were not experienced by any of the cannabis users.

Severity of positive symptoms

There was no significant difference between the total positive symptom score on the PANSS between the cannabis users, and non-cannabis users (F=1.442, p=0.238). The mean score for both groups were within the 'slightly below average' range compared to a group of medicated people with schizophrenia, according to Kay, Opler, and colleagues (1987).

Severity of negative symptoms

No significant difference at (p>0.05) was found between the total PANSS negative symptom score for the cannabis users and the non-cannabis users (F=1.727, p=0.198). The mean scores for both groups were in the 'below average' range compared to medicated individuals with schizophrenia.

To investigate whether different types of negative symptoms were experienced by the two groups further analysis was conducted on the individual items in the negative symptom

subscale. No significant differences were found between the groups on blunted affect (H=0.073, p=0.787), emotional withdrawal (H=0.022, p=0.883), poor rapport (H=0.112, p=0.738), passive/apathetic social withdrawal (H=0.622, p=0.430), difficulties with abstract thinking (F=0.541, p=0.467), lack of spontaneity (H=2.220, p=0.136), or stereotyped thinking (H=0.017, p=0.897). The negative symptom that was least experienced was 'blunted affect' for both cannabis and non-cannabis users, and the more severe was 'difficulty in abstract thinking'.

As can be seen in table 1, the composite subscale that shows the prominence of symptom types, by deducting the positive subscale total from the negative subscale total, shows borderline significance ($F_{(30.562)}$=4.200; p=0.049). As can be seen by the df value, the Welch and Brown- Forsyth test results have been reported as these tests control for the unequal variance found within the groups on this variable. As the result is very close to the cut off point for significance, the null hypothesis should be favoured. However it does show that cannabis users were more likely to have predominant positive symptoms than negative symptoms, and the non-users were likely to have more severe negative symptoms than positive symptoms.

Depression

No significant difference was found between mean total CDS scored for cannabis users and non-cannabis users (F=0.117 p=0.734). The mean scores for both groups suggested that it is unlikely that the groups, on average, were experiencing major depression. Four individuals (25%) in the cannabis using group, and four (20%) of the non-cannabis using

group, obtained a score of 6 or more on the CDS, and therefore these individuals were likely to have been experiencing a major depressive episode.

Substance Use

Cannabis use

The quantity of money spent on cannabis was taken as a measure of quantity of cannabis use. As can be seen from Table 2 there was substantial heterogeneity in the levels of cannabis use, ranging from £8.00 to £300.00 during 30 days. Out of the 16 cannabis users, 8 (50.0%) scored two or greater on the SDS, and therefore were more likely to meet the DSM-IV criteria for cannabis dependence. Only two cannabis users were using no other substances.

Other substance use

As can be seen in Table 2, 27 (75.0%) of the total study sample used at least one substance, and 22 (61.1%) used at least one illicit substance. Nobody in either group reported using illicit methadone, or illicit benzodiazepines. The majority of non-cannabis users (65.0%) used substances. Fourteen of the 16 (87.5%) cannabis users used at least two substances, whilst 4 (20.0%) of the non-cannabis users were polysubstance users. The substance used by the most people, and most frequently in the non-cannabis group was alcohol (n=7; 10.86 days), then crack cocaine (n=6; 10.50 days), then heroin (n=4; 9.25 days), although the difference between frequencies is less than one day. The cannabis non-using group spent more money on crack cocaine (£306.67) than heroin (£87.50) in thirty days.

In the cannabis using group, the substance used by most people, after cannabis, was alcohol (n=12), then cocaine (n=5), followed by heroin (n=1), and amphetamines (n=1). Cannabis was used more frequently (10.00 days), then alcohol (7.58 days), then cocaine (6.20 days) with one participant using heroin on two days, and another participant using amphetamines once in a thirty day period.

Nineteen participants in the total sample reported using alcohol, 12 cannabis users and seven non-cannabis users. The quantity of alcohol consumed in thirty days showed wide variation, ranging from 7.20 – 122.00 units for cannabis users and 1.30 to 480.00 for non-cannabis users. The mean consumption of alcohol was much higher in the cannabis non-using group at 134.19 units, compared to 36.80 units for the cannabis using group.

Crack Cocaine was used by 11 participants in the total sample. The proportions of crack cocaine users were similar in the two groups (31.3% of cannabis users; 30.0% of non-cannabis users). However crack cocaine was used more frequently by non-cannabis users (10.50 days) than cannabis users (6.20 days). Non-cannabis users also spent much more money on it (£306.67) than cannabis users (£182.00). Again the quantities used by different participants in the total sample varied greatly, from between £30.00 and £1200.00 in thirty days.

Five people from the total sample used heroin. Heroin was used by more non-cannabis users (20.0%) than cannabis users (6.3%), and much more money was spent on heroin on average by non-cannabis users (£87.50) than the one cannabis user (£8.00). The money spent by the non-cannabis users ranged from £10.00 to £300.00 during thirty days.

Table 2

Substance use in the previous 30 days

		Total	Cannabis users	Non-cannabis users
Substances	Use 1 substance (excl cannabis)	27 (75.0%)	14 (87.5%)	13 (65.0%)
	Use 1 substance (excl alcohol)	22 (61.1%)	16 (100.0%)	6 (30.0%)
	Use 2+ substances	18 (50.0%)	14 (87.5%)	4 (20.0%)
	Number of people using (%)	19 (52.7%)	12 (75.0%)	7 (35.0%)
	units on typical day (SD)	6.13 (4.38)	5.51 (3.47)	7.20 (5.77)
Alcohol	Range	1.30 – 16.00	2.20 – 15.30	1.30 – 16.00
	Number of days used (SD)	8.79 (9.29)	7.58 (6.32)	10.86 (13.34)
	Range	1 – 30	2 – 20	1 – 30
	Total units in 30 days (SD)	72.68 (127.21)	36.80 (35.23)	134.19 (198.21)
	Range	1.30 – 480.00	7.20 – 112.00	1.30 – 480.00
	Number of people using (%)	5 (13.9%)	1 (6.3%)	4 (20.0%)
	£ on typical day. (SD)	7.80 (3.03)	4.00	8.75 (2.50)
Heroin	Range			5.00 – 10.00
	Number of days used (SD)	7.80 (12.46)	2.00	9.25 (13.89)
	Range	1 – 30		1 – 30
		71.60 (127.80)	8.00	87.50 (141.75)
	Total in £ in 30 days (SD) Range	8.00 – 300.00		10.00 – 300.00
	Number of people using (%)	11 (30.6%)	5 (31.3%)	6 (30.0%)
	£ on typical day. (SD)	30.91 (27.461)	35.00 (37.75)	27.50 (18.37)
Crack Cocaine	Range	5.00 – 100.00	10.00 – 100.00	5.00 – 50.00
	Number of days used (SD)	8.55 (7.69)	6.20 (2.28)	10.50 (10.19)
	Range	1 – 30	4 – 9	1 – 30
	£ in 30 days. (SD)	250.00 (338.17)	182.00 (150.73)	306.67 (449.52)
	Range	30.00 – 1200.00	60.00 – 400.00	30.00 – 1200.00
	Number of people using	1 (2.8%)	1 (6.3%)	0
Amphetamines	£ on typical day.	20	20	0
	Number of days used (SD)	1	1	0
	£ on typical day. (SD)	7.69 (4.50)	7.69(4.50)	
	Range	2.00 – 20.00	2.00 – 20.00	0
	Number of days used (SD)	10.00 (10.73)	10.00 (10.73)	
Cannabis	Range	2 – 30	2 – 30	0
	£ in 30 days. (SD)	84.44 (109.99)	84.44 (109.99)	
	Range	8.00 – 300.00	8.00 – 300.00	0
	SDS total (SD) Range.	2.00 (2.37) 0 – 8	2.00 (2.37) 0 – 8	0

Discussion

All the participants in this study were people who had lived with schizophrenia or schizoaffective disorder for an average of 220.86 months (18.4 years). The results indicated that they were currently experiencing the whole range of negative and positive symptoms. Although the age of the total sample ranged from aged 27 to 73 years, the mean age was 45.61 years old. The CDS scores suggest that the majority of the sample were unlikely to be experiencing a major depressive episode at the time of interview. A surprising finding of this study was the amount of substance use across the total sample, as 75% used at least one substance other than cannabis, and 61.1% of the total sample were using illicit substances. Polysubstance prevalence was found to be as high as 50.0% in the total sample. The prevalence of substance use in this study exceeds the amount of substance abuse found in another AOT sample by Graham and colleagues (2001), which was between 26 and 45%. In the current study, there was also an unexpected amount of substance use reported by the non-cannabis users. Whilst 87.5% of cannabis users used other substances, 65.0% of non-cannabis users also used substances. The people in the non-cannabis using group who used alcohol, crack cocaine, or heroin, used them more frequently and used greater amounts than the people using cannabis.

With regards to symptoms, the results show that there was no significant difference between the negative symptoms, and indeed positive symptoms, experienced by people who were using cannabis and those who were not. The hypotheses, therefore, were not supported. The results were in contrast to research that found fewer negative symptoms in cannabis users or misusers (Bersani et al., 2002; Compton et al., 2004; Dubertret et al., 2006). However, it was in line with other literature that also found no association between negative symptoms and cannabis use or misuse (Addington & Addington, 2007; Boydell et al., 2007; Grech et al.,

2005). Slightly greater levels of positive symptoms were experienced by individuals using cannabis compared to non-cannabis users, but this was as small as two points on the PANSS. This small difference may be indicative of the suggestion by Hides and colleagues (2006) that cannabis users experience greater positive symptoms, which may then contribute to greater cannabis use. There was also a tendency for cannabis users to experience less severe negative symptoms than cannabis non-users, but again this was only a two point difference on the PANSS. Whilst these results failed to meet significance, they were trends in the direction found by earlier research (Bersani et al., 2002; Compton et al., 2004; Dubertret et al., 2006).

There seem to be three factors that may account for no significant difference being found between the negative symptoms experienced by cannabis users and non-cannabis users. These are the sample size of the current study; the historical profile of substance use; and the use of other substances by cannabis users and cannabis non-users.

The sample size in this study was smaller than the sample in Bersani and colleagues' (2002) study (n=125), Dubertret and colleagues' (2006) study (n=205), and Batki and colleagues' (2008) study (n=80). It may be argued, therefore, that the sample was not large enough to find any significant difference between the negative symptoms being experienced by cannabis users or non-cannabis users. The sample size in the current research, however, was greater than the sample size in Compton and colleagues' study (n=18) who did find significantly lower negative symptoms in cannabis misusers. Studies that did not find the association between cannabis and negative symptoms contained 203, 757, and 97 people (Addington & Addington, 2007; Boydell et al., 2007; Grech et al., 2005) respectively. Therefore it is unlikely that a small sample size is the only reason why no association was found between negative symptom severity and cannabis in the current study.

The second factor that is hypothesised to contribute to the lack of association between negative symptoms and cannabis use may be that only current substance use was assessed. Therefore, these results do not take into account the course of cannabis use, or indeed the course of negative symptoms experienced throughout the illness duration. Therefore, observations such as earlier onset of negative symptoms being found amongst cannabis users (Veen et al., 2004), or cannabis use at the time of illness onset being associated with less negative symptoms during the illness (Dubertret et al., 2006) could not be assessed in the current sample.

The third factor that may account for no association being found between cannabis use and negative symptoms is the extent of other substance use and poly-substance use, including a number of Class A drugs, found within both cannabis and non-cannabis users. Whilst more cannabis users (75.0%) used alcohol than non-cannabis users (35%), more non-cannabis users used heroin (20%) than cannabis users (6.3%), and similar number of cannabis users (31.3%) and non-cannabis users (30%) used crack cocaine. For those who used these substances, the non-cannabis users used greater amounts of alcohol, crack cocaine, and heroin than cannabis users.

The levels of substance use in the non-cannabis using group have not been observed in other cannabis/symptom research. Studies that have documented other substance use found that alcohol and cocaine (Batki et al., 2008; Compton et al., 2004), alcohol and opiates (Dubertret et al., 2006), alcohol, hallucinogens, opiates, and stimulants (Bersani et al., 2002), alcohol, amphetamines, and hallucinogens (Addington & Addington, 2007) and opiates, cocaine, hallucinogens, glue and stimulants (Grech et al., 2005) were being used. The majority of these studies discussed substance use across the total sample, and did not identify or differentiate the use of substances in the cannabis and non-cannabis using groups

(Addington & Addington, 2007; Batki et al., 2008; Grech et al., 2005). Dubertret and colleagues (2006) found that their cannabis misusers were nearly five times more likely to be misusing other substances, particularly alcohol and opiates, than the group who did not misuse cannabis. Similarly, Peralta and Cuesta (1992) found greater misuse of other substances by their cannabis users (52%) than their non-cannabis users (11%). Compton and colleagues (2004) found alcohol or cocaine dependence in 37.5% of their cannabis users, compared to no dependence in the 'non-cannabis dependent' group, but 60% of this group met criteria for cannabis or alcohol abuse. Therefore Compton and colleagues' research is not comparable to the cannabis users or non-cannabis users in the current study. Bersani and colleagues (2002) found that their cannabis users and non-cannabis users showed no significant difference in other substance use, as 26% of cannabis users, and 27% of non-cannabis users used alcohol, and 11% of cannabis users, and 13% of non-cannabis users used tranquilisers. Therefore, it may be that the use of different types, and amounts, of substances may have confounded results, and may be responsible for some of the variance found across studies. The high prevalence of substance use in the current research may explain some of the incongruence in results compared to Bersani and colleagues, Peralta and Cuesta, and Dubertret and colleagues, who all found less polysubstance use in their samples.

The question remains as to what effect the other substances may have had on negative symptoms. Heroin has been reported to have antipsychotic properties (Pacini & Maremmani, 2005), and therefore may reduce positive and negative symptoms. However, opiates have also been found to increase negative symptoms (Dixon et al., 1990). Past or current cocaine misuse has been associated with fewer negative symptoms than those who had no history of substance abuse (Lysaker, Bell, Beam-Goulet, & Milstein, 1994), but again, others found no such correlation (Sevy, Stanley, Opler, & van Praag, 1990). Both heroin (Tanda, Pontieri, &

Di Chiara, 1997) and cocaine (Kreek, 1996) affect the same neurological pathway, namely the dopamine pathway, as cannabis, which may partially explain why more people who were in the non-cannabis using group were using more heroin and cocaine.

Alcohol consumption has also been found to decrease when the antipsychotic Clozapine is introduced (Drake, Xie, McHugo, & Green, 2000), which may link alcohol use with attempts to alleviate symptoms. Alcohol and cannabis may have similar effects on individuals as they are both depressants, but are both perceived by substance abusers, along with cocaine, to relieve depression and help them relax (Dixon et al., 1991).

Only two studies dissected their samples to analyse 'pure' cannabis users compared to non-users of any substances. Dubertret and colleagues (2006) found that 'pure' cannabis users experienced significantly less avolition-apathy than people using no substances. In contrast, Bersani and colleagues (2002) found that there was no significant difference between negative symptoms experienced by 'pure' cannabis users and those not using any substance, but polysubstance users showed significantly fewer negative symptoms compared to the 'pure' cannabis users. Unfortunately, in the current study 'pure' cannabis users could not be compared to non-substance users because there were only 2 people (12.5%) and 7 people (35%) who would fit these categories respectively. Therefore the role of cannabis in negative symptom severity is unclear in the current study, due to other substance use being so prevalent.

The absence of cannabis use in the cannabis non-using group may be due to cannabis being replaced by other substances. The 'gateway theory' (Kandel, 1975) of substance use suggests substances are used in a specific order. It is theorised that alcohol use occurs first, then tobacco, and then cannabis. Cannabis is then proposed as a 'gateway' drug, in that its use

increases the likelihood that other 'harder' drugs, such as cocaine and heroin might be used. Although participants in the current sample were suitably assigned to the 'non-cannabis using group' at the time of interview, it is possible that these individuals may have used cannabis in the past, and have consequently moved on from using cannabis to using the 'harder drugs', heroin and cocaine. However, the pattern of lifetime substance use was not collected so this cannot be confirmed in the current study.

The severity of negative symptoms experienced by both the cannabis and non-cannabis users was assessed as 'below average' on the PANSS. It has been hypothesised that substances may not affect symptoms, but rather symptoms influence access to substances. That is, people with less negative symptoms are more socially able, and consequently are able to go out and obtain drugs (Mueser et al., 2000). This hypothesis is not disputed within this research, as both the cannabis and non-cannabis indicated 'below average' levels of negative symptoms, and both groups were obtaining illicit substances. However, there may be other reasons for the finding of 'below average' symptoms.

The 'below average' negative symptoms may be due to symptoms being treated effectively, by the AOTs, with medication, psychological therapies and social engagement opportunities. Another possibility may be that the medicated individuals with schizophrenia that the t scores and classifications were based on (Kay, Fiszbein et al., 1987) were different to this Assertive Outreach population. The PANSS was developed in 1987 and therefore the medication that the normative sample was likely to have received may differ to medication available today. They were also inpatients from long-term psychiatric units, which differs from the community sample in this study. Perhaps therefore the 'below average' scores found in the normative sample in 1987 differ from what would be deemed 'below average' for the

current AOT sample, and indeed other recent research samples where the PANSS has been used.

Limitations

Less than 20% of the eligible service users in the AOTs agreed to take part in the current research. It was speculated that perhaps individuals who were experiencing the most severe negative symptoms may have declined to take part, as some degree of motivation was required to attend the interview. Individuals who were acutely unwell and required detention in hospital were excluded due to consent issues and therefore this population was not represented in the current study. Therefore the research sample may not have represented all individuals being cared for by AOTs.

A methodological limitation to the design was that the assessments were conducted by the author, who knew participants' group allocation. However, no statistical analysis was conducted until all data had been collected so as to restrict observations of any patterns emerging within groups. Participants were not informed of the research hypotheses before participation, and therefore their responses were unlikely to have been altered by desires to give correct answers. However a potential bias is that people with mental health difficulties, such as schizophrenia, may have been suspicious about disclosing information to a stranger about their mental health and about illicit substance use. Urine testing has been used in other research to detect the use of substances, but this would not have provided information about quantities and frequencies of use.

Information regarding current medication regimes was not collected. If medication type or dosage differed between the cannabis users and non-cannabis users, this may have affected the symptoms found within each group.

The total sample represented a large variety of ages, and durations of illness. Although there was no difference between the two groups on these two variables, interactions between cannabis and age, or cannabis and chronicity of illness could not be analysed due to the small sample size. In future studies with larger samples, it may be possible to stratify groups due to age and illness duration to assess any interactions of these variables with symptoms and cannabis use. As previously mentioned, the trajectory of cannabis use, and other substance use, should be investigated further, giving special attention to the onset of cannabis use and the onset of illness.

Conclusion

This research suggests that the negative symptoms, and indeed positive symptoms that are experienced by people who use cannabis alongside other substances, are not significantly different to the symptoms experienced by people who do not use cannabis, but may use other substances. As high levels of substance use for people who are under the care of AOT have been replicated in this study, it seems important that all substance use is considered whilst formulating people's psychosis symptoms, functioning, current difficulties and delivering treatment. Due to the surprising amounts of substances being used by people who are not currently using cannabis, it may be useful in further research to assess the impact of different substances on symptoms, daily functioning, and further substance use. Further research is also

required to investigate the trajectory of substance use before and throughout the course of schizophrenia and schizoaffective disorder.

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PUBLIC DOMAIN BRIEFING PAPER

NEGATIVE SYMPTOMS IN SCHIZOPHRENIA:

THE EFFECTS OF PSYCHOLOGICAL THERAPY

AND THE EFFECTS OF CANNABIS.

Introduction

Symptoms of schizophrenia and related disorders are often split into two groups, 'positive symptoms' and 'negative symptoms'. Positive symptoms include experiences that most people do not have, such as hallucinations and delusions. 'Negative symptoms' described things that have been lost because of the schizophrenia, such as motivation or pleasure. As negative symptoms have been linked to poorer outcome (e.g. Siegel et al., 2006) treatment of these symptoms is important in order to improve individuals' mental health and daily functioning. Other factors that are linked to poorer functioning, such as cannabis use, should also be researched in order to find out if they have an effect on negative symptoms.

Literature Review

The National Institute of Clinical Excellence (2009) recommended psychological therapies, and in particular cognitive behavioural therapy (CBT) and family interventions, for the treatment of schizophrenia. However, other psychological therapies have also been conducted in order to alleviate symptoms of schizophrenia and related disorders, such as cognitive remediation therapy (CRT), and body-oriented psychological therapy (BPT). Literature published in the last 11 years suggests that all four of these psychological therapies can improve negative symptoms. Also, the improvements found following CBT could last up to five years. Different therapies appeared to effect different negative symptoms, such as BPT improving slowed movements and flattened mood, whilst family interventions increased motivation and improved social interactions. Out of the four psychological therapies, individual sessions of CBT were the most consistent at improving negative symptoms.

Research Study

Cannabis has been found to be the second most commonly used substance, after alcohol, in people with severe mental health problems (Graham & Maslin, 2002). The effect of cannabis on negative symptoms remains uncertain, as some research has found no link between the two (e.g. Addington & Addington, 2007), and some have found less negative symptoms in people using cannabis (e.g. Bersani et al., 2001). Depression often occurs alongside schizophrenia, and can be mistaken for negative symptoms. This research was conducted to see whether severity of negative symptoms differs for cannabis users compared to non-cannabis users, who are under the care of Assertive Outreach Teams (AOTs). It also addressed whether cannabis use, depression, and negative symptoms occur together.

Participants

The 39 participants were people who had schizophrenia or schizoaffective disorder, and who were under the care of four AOTs. The average age for the total sample was 45.61 years old, and 83.3% were men. There was no difference in age, gender, ethnicity, diagnoses, or illness duration between people who used cannabis and those who did not.

Method

The participants attended one interview with the researcher, in which mental health and depressive symptoms were assessed using structured interviews. The participants were also asked about the substances that they had used in the last thirty days. If they stated that they had used cannabis at least once per week in the 30 day period, they were allocated to the

‘cannabis using’ group (16 people). If they had not used cannabis at all, they were allocated to the ‘non-cannabis using’ group (20 people). Dependence on cannabis was also assessed. The mental health symptoms, depressive symptoms, and other substance use were then compared between the cannabis users and the non-cannabis users.

Results

- There were no significant differences between the severity of negative symptoms, or positive symptoms experienced by people using cannabis and those not using cannabis. Both groups experienced ‘below average’ levels of negative symptoms compared to medicated inpatients with schizophrenia.
- There was no significant difference in the levels of depressive symptoms experienced by people using cannabis and those who were not.
- The majority of cannabis users and non-cannabis users were using others substances.

Conclusions

The results were similar to those found in studies of people in their first episode of psychosis, but differed from those found in people who had had the illness for longer than one episode. These unexpected findings may be due to three factors: the sample may not have been large enough to dictate a difference; past substance use may affect current symptoms and past drug use was not assessed in this study; and the quantity of other drugs being used by both the cannabis users and the non-cannabis users may have affected symptoms.

This study found very high levels of substance use in people under the care of AOTs, even when some of these people were not using cannabis. As both cannabis use, other substance use, and negative symptoms have been linked to poorer outcome in schizophrenia and related disorders, interactions between each substance and negative symptoms need to be researched. Substance misuse and negative symptoms need to be addressed during mental health treatment for people under the care of AOTs.

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APPENDICES

APPENDIX 1

LETTER FROM THE LOCAL ETHICS COMMITTEE

NHS

National Research Ethics Service

South Birmingham Research Ethics Committee
Osprey House
Albert Street
Redditch
Worcestershire B97 4DE
Rosa.Downing@westmidlands.nhs.uk
Telephone: 01527 587575
Facsimile: 01527 587503

Chairman: **Dr S Bowman**
Co-ordinator: **Mrs Rosa Downing**

Date: 25 March 2009

Miss Victoria Altoft
Trainee Clinical Psychologist
University of Birmingham
School of Clinical Psychology
Edgbaston
Birmingham
B15 2TT

Dear Miss Altoft

Full title of study: **A study investigating negative symptoms in people who experience psychosis and use cannabis.**

[redacted]

Thank you for your letter dated 18 March 2009, responding to the Committee's request for further information on the above research and submitting revised documentation.

The further information was considered by the Vice Chair.

Confirmation of ethical opinion

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

Conditions of the favourable opinion

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

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

Management permission at NHS sites ("R&D approval") should be obtained from the relevant care organisation(s) in accordance with NHS research governance arrangements. Guidance on applying for NHS permission is available in the Integrated Research Application System or at http://www.rdforum.nhs.uk.

Approved documents

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

Document	Version	Date
Interview Schedule FACE Health and Social Assessment		
Supervisors CV		
Participant Consent Form	2	18 March 2009
Participant Information Sheet	2	18 March 2009
Questionnaire: Section B; Maudsley Addiction Profile		
Questionnaire: The Severity of Dependence Scale		
Questionnaire: The Calgary Depression Scale		
Interview Schedules/Topic Guides	SCI-PANSS	
Letter from Sponsor		22 January 2009
Protocol	1	16 January 2009
Investigator CV		22 January 2009
Application		14 January 2009
Response to Request for Further Information		

Statement of compliance

The Committee is constituted in accordance with the Governance Arrangements for Research Ethics Committees (July 2001) and complies fully with the Standard Operating Procedures for Research Ethics Committees in the UK.

After ethical review

Now that you have completed the application process please visit the National Research Ethics Website > After Review

You are invited to give your view of the service that you have received from the National Research Ethics Service and the application procedure. If you wish to make your views known please use the feedback form available on the website.

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
- Progress and safety reports
- Notifying the end of the study

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

We would also like to inform you that we consult regularly with stakeholders to improve our service. If you would like to join our Reference Group please email referencegroup@nres.npsa.nhs.uk.

09/H1207/9	**Please quote this number on all correspondence**

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

Yours sincerely

[redacted]

Dr J Cochrane
Vice Chair

Enclosures: "After ethical review – guidance for researchers" SL- AR2 for other studies]
Site approval form

Copy to: Dr Brendan Laverty

South Birmingham Research Ethics Committee

LIST OF SITES WITH A FAVOURABLE ETHICAL OPINION

For all studies requiring site-specific assessment, this form is issued by the main REC to the Chief Investigator and sponsor with the favourable opinion letter and following subsequent notifications from site assessors. For issue 2 onwards, all sites with a favourable opinion are listed, adding the new sites approved.

REC reference number:	[redacted]	**Issue number:**	1	**Date of issue:**	25 March 2009
Chief Investigator:	Miss Victoria Altoft				
Full title of study:	A study investigating negative symptoms in people who experience psychosis and use cannabis.				

This study was given a favourable ethical opinion by South Birmingham Research Ethics Committee on 25 March 2009. The favourable opinion is extended to each of the sites listed below. The research may commence at each NHS site when management approval from the relevant NHS care organisation has been confirmed.

Principal Investigator	*Post*	*Research site*	*Site assessor*	*Date of favourable opinion for this site*	*Notes* (1)
Miss Victoria Altoft	TRAINEE CLINICAL PSYCHOLOGIST	Birmingham and Solihull Mental Health Trust	South Birmingham Research Ethics Committee	25/03/2009	

Approved by the Chair on behalf of the REC:

[redacted]..... (Signature of Chair/Co-ordinator)

[redacted]..... (Name)

(1) *The notes column may be used by the main REC to record the early closure or withdrawal of a site (where notified by the Chief Investigator or sponsor), the suspension of termination of the favourable opinion for an individual site, or any other relevant development. The date should be recorded.*

APPENDIX 2

PARTICIPANT INFORMATION SHEET

Version 2
18/03/2009

Participant Information Sheet

Negative Symptoms in people who experience psychosis, and use cannabis

I would like to invite you to take part in a research study that is looking at the symptoms experienced by people with a diagnosis of psychosis, and who do, or do not use cannabis. Before you decide if you would like to take part, you need to know why the research is being done, and what you would need to do. Please read this information sheet, which explains the research fully. If you have any questions, or would like more information, feel free to talk to me or a member of your care team about the research. Part 1 explains why the research is being done, and what would be involved in taking part. Part 2 explains how the research will take place.

Part 1

What is the purpose of the study?

This research intends to find out whether people who have psychosis and use cannabis experience different negative symptoms than those who do not use cannabis. Negative symptoms include loss of motivation, reduced emotional responses, decreased thought processes, reduced enjoyment in activities, and social withdrawal. It is important to look at these symptoms because they might feel uncomfortable and might stop people from living the full life that they would like to.

The study also intends to look at whether negative symptoms and depression occur together in people under the care of Assertive Outreach Services. This information may help the Assertive Outreach Teams to care for all the different difficulties that people may be facing if they experience negative symptoms as part of their psychosis.

Why have I been invited?

Your Consultant Psychiatrist or care-coordinator in Assertive Outreach has put your name forward as somebody who might like to take part in this research. You have been invited to take part because you have been given a diagnosis that fits under the term ‘psychosis’. These diagnoses include schizophrenia, schizotypal and delusional disorders. You also access Assertive Outreach Services, and you are able to understand English fluently enough to take part in an interview about your diagnosis and your drug use.

Do I have to take part?

No, you do not have to take part in the study. It is up to you to decide. I will describe the study to you now, and then give you this information to look through in your own time. You can then tell a member of your care team if you would like to take part or not. If you do want to take part, they will tell the researcher, and I will contact you to arrange an interview. You are free to withdraw at any time until all of your information has been collected and analysed. You do not have to give a reason for withdrawing. Taking part, or deciding not to take part in the research will not affect the care that you receive from the Assertive Outreach Team.

What will happen to me if I take part?

If you decide to take part, the researcher will arrange to meet with you in order to conduct an interview. This interview will last approximately one hour and will usually take place at the Assertive Outreach Team offices. In the interview, the researcher will ask you some questions which will look at your mental health, behaviour, lifestyle, mood, and possible drug use. Everyone who takes part in the research will be asked the same questions.

The researcher will also ask for your permission to look at some of your information at the Assertive Outreach Team. This information will come from the FACE: Health and Social Assessment Scale, which is the interview that is done with your care-coordinator roughly every 6 months. The researcher will only be looking at information that is relevant to the research.

When the FACE information has been collected and the interview has taken place, your information will be put together with other people's answers, and then analysed using a computer program. The results will be shown for a group of people who do use cannabis and a group of people who do not use cannabis. No individual information will be reported.

Expenses and Payments

Taking part in the research may require you to travel for the interview, and will take one hour of your spare time. We can, therefore, offer you £5.00 to cover any expenses and to compensate for your time, when you attend the interview.

What are the possible disadvantages and risks of taking part?

If you decide to take part you are going to be asked to discuss your mood, mental health, lifestyle, and any drugs that you have used. It may be uncomfortable or upsetting to talk about some of these things. If you feel upset during the interviews, or do not want to discuss anything that you are asked about, you have the right to stop the interview at anytime, or to withdraw from the research. If you would like to talk to somebody about any upset caused, your Assertive Outreach Team will be able to support you.

What are the potential benefits of taking part?

We cannot promise that your care will change as a result of taking part in this study. However, the information that we get from this study may help to improve the recognition of certain symptoms, and how cannabis use might affect these symptoms in psychosis.

What happens when the research stops?

The care you get from the Assertive Outreach team will not be affected by taking part in this study. After the study, your care will continue as it did before and during the study.

What if there is a problem?

If you are unhappy when you are taking part in the study, you can withdraw from it. Any complaints or issues that you may have about the study will be addressed by Dr Brendan Laverty, Assistant Director of Research and Commercial Services at the University of Birmingham. Further details will be given in Part 2 of this leaflet.

Will my taking part in the study be kept confidential?

The only people who will be aware that you are taking part in this study will be the researcher who is doing the interview with you, your Consultant Psychiatrist, and your care-coordinator within the Assertive Outreach Team. Your Consultant Psychiatrist and care-coordinator will not be told about the answers that you give. However, if you begin to feel distressed you may choose to talk to a member of the Assertive Outreach Team about this. The researcher will inform the Assertive Outreach Team if you mention anything that suggests that you or anybody else is at risk of harm. Any personal drug use that you talk about in the interview will not be reported to the Assertive Outreach Team.

When you are giving your answers, they will be written down. However, no-one except the researcher will be able to identify that they are your answers because all questionnaires will have an identifier code on them, and not your name. The information that is put on the computer for analysis will only include the identifier code, and will be password protected, so only the researcher can access it.

Part 2

What if relevant new information becomes available?

If any new information that affects the study becomes available the researcher will let you know. If the study is stopped the researcher will tell you.

What will happen if I don't want to carry on with the study?

You are able to withdraw from the study at any time up to the data analysis. If you decide to withdraw, we may ask for your permission to use the information that has been collected up to that point. It is your right to say no to this. All information that has been collected will be destroyed if it is not being used in the study.

What if there is a problem?

If you have any concerns about the research, you can speak to Dr Brendan Laverty, Assistant Director of Research and Commercial Services at the University of Birmingham. His contact details are as follows:

Dr Brendan Laverty,
Assistant Director of Research and Commercial Services
Aitchison Building
University of Birmingham
Edgbaston
Birmingham
B15 2TT
Telephone: 0121 4147618.

In the event that you are harmed during the study due to someone's negligence, then you may have the grounds for a legal action for compensation against the University of Birmingham or the National Health Service Trust.

What will happen to the results?

The results from all of the participants will be analysed together. The answers given by people who use cannabis will then be compared to the answers given by people who do not use cannabis.

A brief written summary of the study will be given to each participant. Participants who do not read will have the summary read to them during a routine weekly visit from Assertive Outreach staff.

The Assertive Outreach Teams will get a written summary of the overall results. Each Assertive Outreach Team will also receive a summary of anonymous data collected from participants being cared for by that team.

The researchers hope to publish the anonymous results in a journal and in a paper that will be kept in the University of Birmingham Library.

Who is organising and funding the research?

The study is organised and funded by the University of Birmingham. The Assertive Outreach Teams and the researchers are not receiving additional funds to conduct this study.

Who has reviewed the study?

All research in the NHS is looked at by an independent group of people, called a Research Ethics Committee to protect your safety, rights, wellbeing and dignity. This study has also been reviewed by clinical psychologists working at The University of Birmingham.

Further information and contact details

If you would like further information or clarification about any aspect of the study please contact:

Victoria Altoft
Chief Investigator
School of Psychology
University of Birmingham
Edgbaston
B15 2TT
Telephone: 0121 4147576

Dr Hermine Graham
Consultant Clinical Psychologist
School of Psychology
University of Birmingham
Edgbaston
B15 2TT
Telephone: 0121 4147204

Dr Alan Meaden
Consultant Clinical Psychologist
208 Monyhull Hall Road
Kings Norton
Birmingham
B30 3QJ
Telephone: 0121 6783400

APPENDIX 3

PARTICIPANT CONSENT FORM

Version 2
18/03/2009

CONSENT FORM

Title of Project: **Negative Symptoms in people who experience psychosis, and use cannabis**

Name of Researcher: Victoria Altoft

Participant Identification for this trial:

1) I confirm that I have read and understand the information sheet for the above study. I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily. ☐

2) I understand that my participation is voluntary and that I am free to withdraw at any time before all my answers have been collected and analysed, without giving any reason, and without my medical care or legal rights being affected. ☐

3) I agree to the my FACE: Health and Social Assessment Scale information that is stored by the Assertive Outreach Team to be viewed by the researchers. ☐

4) I understand that my Consultant Psychiatrist and my Assertive Outreach Care-coordinator know that I am participating in the study. ☐

5) I understand that relevant sections of my medical notes and data collected during the study, may be looked at by individuals from The University of Birmingham, from regulatory authorities or from the NHS Trust, where it is relevant to my taking part in the research. I give permission for these individuals to have access to my records. ☐

6) I agree to take part in the above study. ☐

Name of Participant: _____

Date: _____ Signature: _____

Name of Person taking consent: _____

Date: _____ Signature: _____

APPENDIX 4

DEMOGRAPHIC INFORMATION SHEET

Questionnaire Pack

Identifier Code: _____

Team: _____

Duration with Team: _____ years _____ months

Age: _____ years _____ months

Gender: **Male** ☐ **Female** ☐

Ethnicity:

White ☐
- **British** ☐
- **Irish** ☐
- **Other** ☐

Mixed ☐
- **White and Black Caribbean** ☐
- **White and Black African** ☐
- **White and Asian** ☐
- **Other Mixed Background** ☐
- **(Please state)** _____

Asian or Asian British ☐
- **Indian** ☐
- **Pakistani** ☐
- **Bangladeshi** ☐
- **Other Asian Background** ☐
- **(Please state)** _____

Black or Black British ☐
- **Caribbean** ☐
- **African** ☐
- **Other Black Background** ☐
- **(Please state)** _____

Chinese ☐

Other Ethnic Group ☐
(Please state) _____

APPENDIX 5

STRUCTURED CLINICAL INTERVIEW FOR

THE POSITIVE AND NEGATIVE SYNDROME SCALE (PANSS)

STRUCTURED CLINICAL INTERVIEW
FOR THE POSITIVE AND NEGATIVE SYNDROME SCALE
(SCI-PANSS)

Data on **LACK OF SPONTANEITY** and **FLOW OF CONVERSATION**, **POOR RAPPORT** and **CONCEPTUAL DISORGANISATION.**

notes

Hi, I'm ..... We're going to be spending the next 20 or 30 minutes talking about yourself and your reasons for being here. Maybe you can start by telling me something about yourself and your background? (Allow at least 5 minutes for a non-directive phase serving to establish rapport in the context of an overview before proceeding to the specific questions listed below.)

Data on **ANXIETY.**

notes

1. Have you been feeling worried or nervous in the past week?

yes

no

2. Would you say that you're usually calm and relaxed?

3. What's been making you feel nervous (worried, uncalm, unrelaxed)?

4. Just how nervous (worried, etc.) have you been feeling?

5. Have you been shaking at times, or has your heart been racing?

6. Do you get into a state of panic?

7. Has your sleep, eating or participation in activities been affected?

Data on **DELUSIONS (GENERAL)** and **UNUSUAL THOUGHT CONTENT.**

notes

1. Have things been going well for you?

2. Has anything been bothering you lately?

3. Can you tell me something about your thoughts on life and its purpose?

4. Do you follow a particular philosophy?

5. Some people tell me they believe in the Devil; what do you think?

6. Can you read other people's minds?

yes

no

7. How does that work?

8. Can others read your mind?

yes

9. How can they do that?

no

10. Is there any reason that someone would want to read your mind?

11. Who controls your thoughts?

Data on **SUSPICIOUSNESS/PERSECUTION, PASSIVE/APATHETIC SOCIAL WITHDRAWAL, ACTIVE SOCIAL AVOIDANCE** and **POOR IMPULSE CONTROL.**

notes

1. How do you spend your time these days?

2. Do you prefer to be alone?

3. Do you join in activities with others?

no

4. Why not? ... Are you afraid of people or do you dislike them?

If 'yes'

yes

5. Can you explain?

If 'yes'

6. Tell me about it?

7. Do you have many friends?

If 'no'

8. Just a few? (If 'yes' go to Q. 11)

If 'no'

yes

9. Any? (If 'no' ask Why?)

If 'yes'

10. Why just a few friends?

11. Close friends?

If 'no'

yes — 12. Why not?

13. Do you feel you can trust most people? (If 'yes' go to Q15)

no

14. Why not?

15.Are there some people in particular that you don't trust?

notes

yes

16. Can you tell me who they are? (If 'no go to Q.22)

yes

17. Why don't you trust people (or named specific person)?

(If 'don't know' or 'don't want to say')

18. Do you have a good reason not to trust?

no

19. Is there something that ... did to you?

20. Perhaps might do to you now?

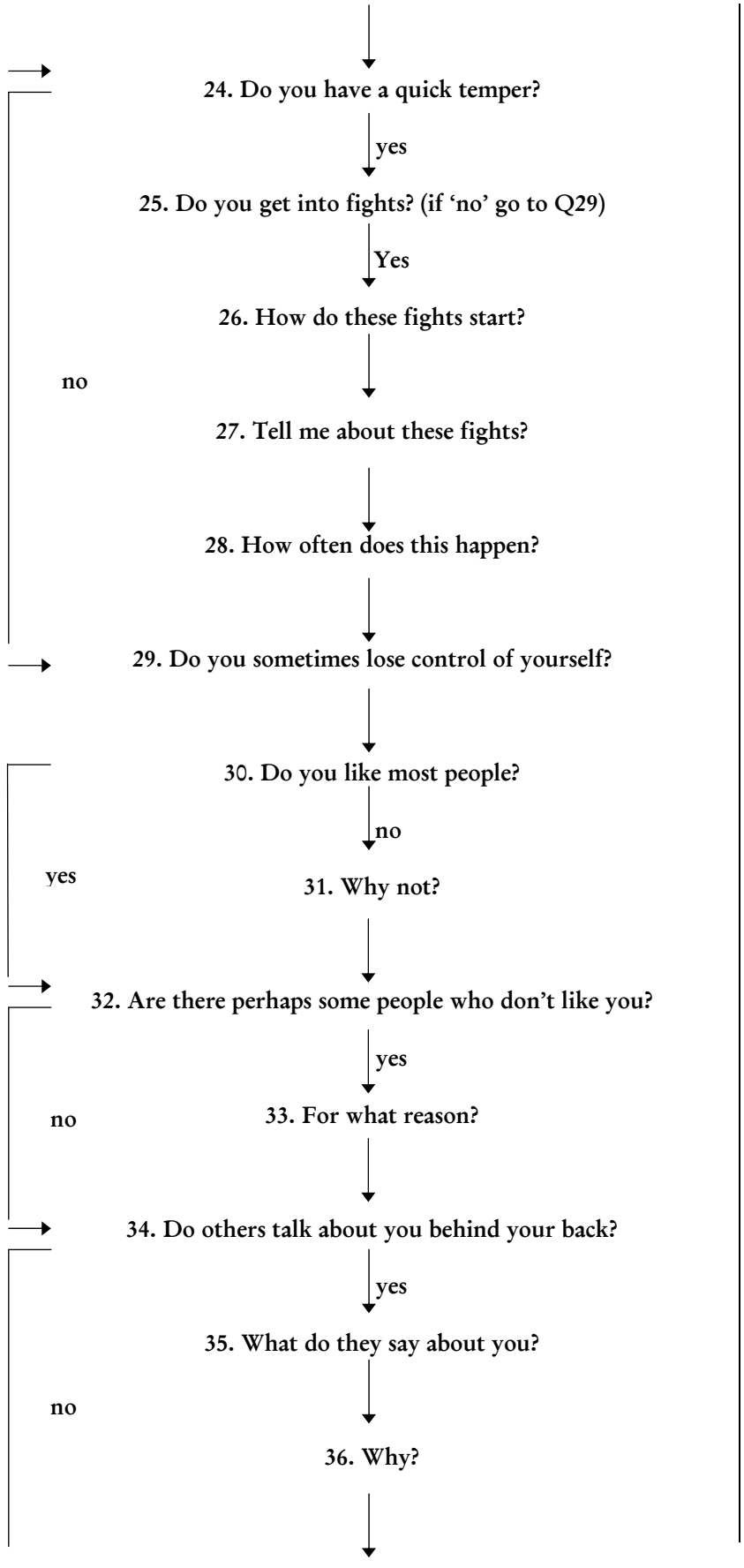
(If 'yes')

21. Can you explain to me?

22. Do you get along well with others?

no

yes — 23. What's the problem?


24. Do you have a quick temper?
yes
25. Do you get into fights? (if 'no' go to Q29)
Yes
26. How do these fights start?
no
27. Tell me about these fights?
28. How often does this happen?
29. Do you sometimes lose control of yourself?
30. Do you like most people?
no
yes
31. Why not?
32. Are there perhaps some people who don't like you?
yes
no
33. For what reason?
34. Do others talk about you behind your back?
yes
35. What do they say about you?
no
36. Why?

notes

37. Does anyone ever spy on you or plot against you? (If 'no' go to next page)

yes

38. Do you sometimes feel in danger? (If 'no' go to next page)

yes

39. Would you say your life is in danger? (If 'no' go to next page)

yes

40. Is someone thinking of harming you or even perhaps thinking of killing you? (If 'no' go to next page)

yes

41. Have you gone to the Police for help?

42. Do you sometimes take matters into your own hands or take action on those who might harm you? (If 'no' go to next page)

yes

43. What have you done?

Data on **HALLUCINATORY BEHAVIOUR** and **ASSOCIATED DELUSIONS.**

notes

1. Do you once in a while have strange or unusual experiences?

2. Sometimes people tell me that they can hear strange noises or voices inside their head that others can't hear. What about you?

no

3. Do you sometimes receive personal communication from the radio or TV?

4. From God or the Devil? (If 'no' go to Q20)

yes

5. What do you hear?

yes (if voices)

6. Are these as clear and loud as my voice?

7. How often do you hear these voices (noises, messages, etc)?

8. Does this happen at a particular time of day or all the time?

Go to Q20

9. Can you recognise whose voices these are?

10. What do the voices say?

11. Are the voices good or bad?

12. Pleasant or unpleasant?

13. Do the voices interrupt your thinking or your activities?

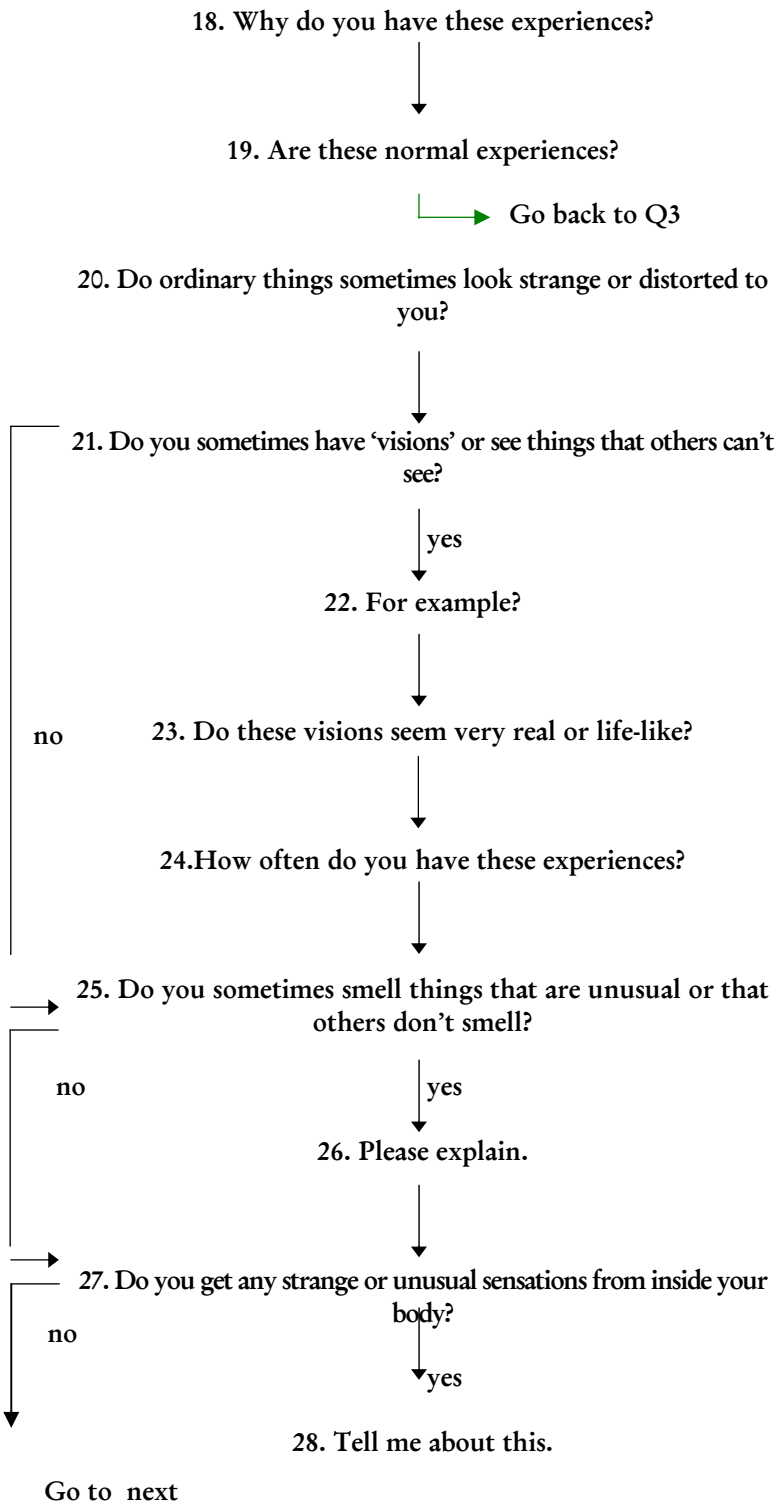
14. Do they sometimes give you orders or instructions?

15. For example?

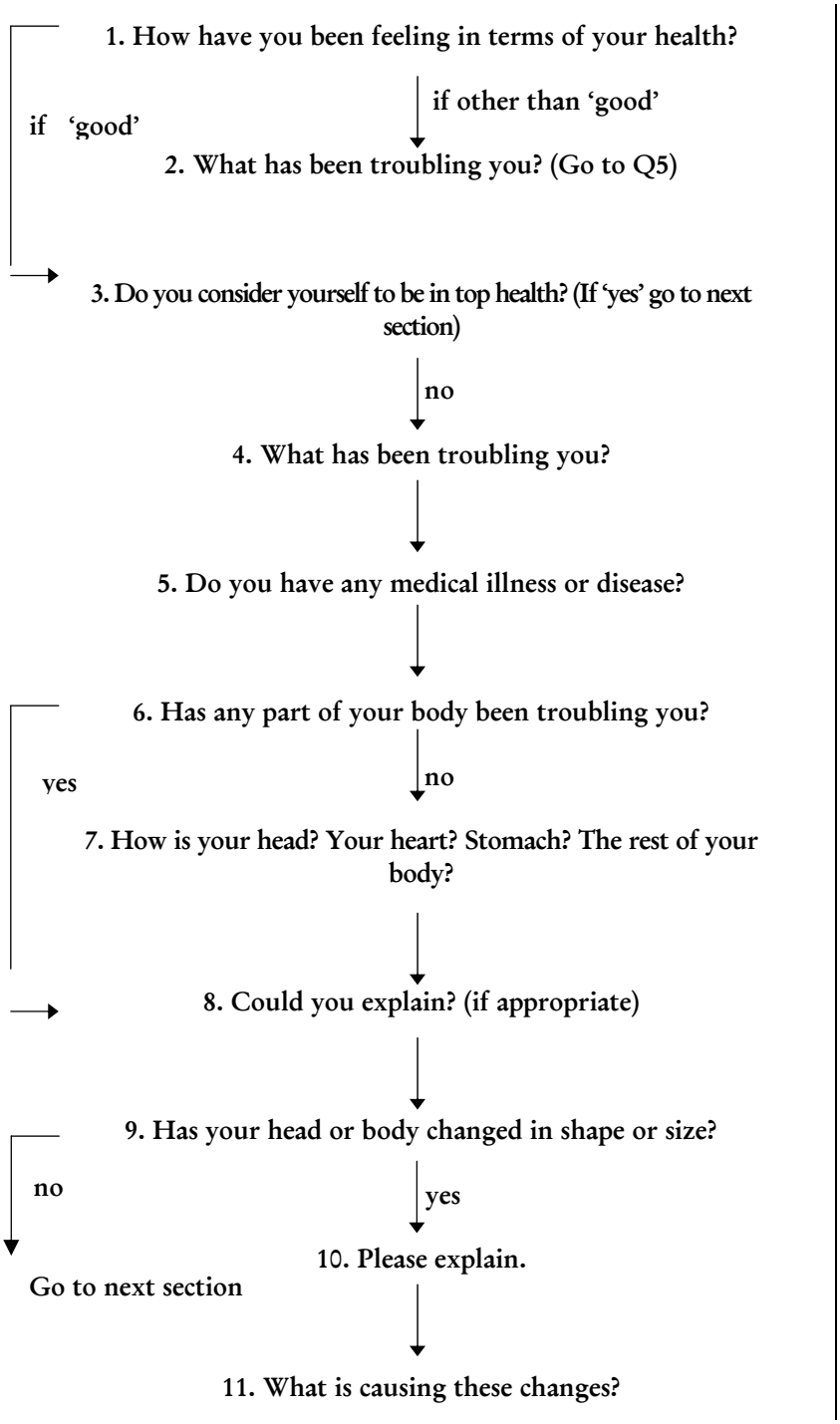
notes

16. Do you usually obey these orders (instructions)?

17. What do you make of these voices (or noises): Where do they really come from?

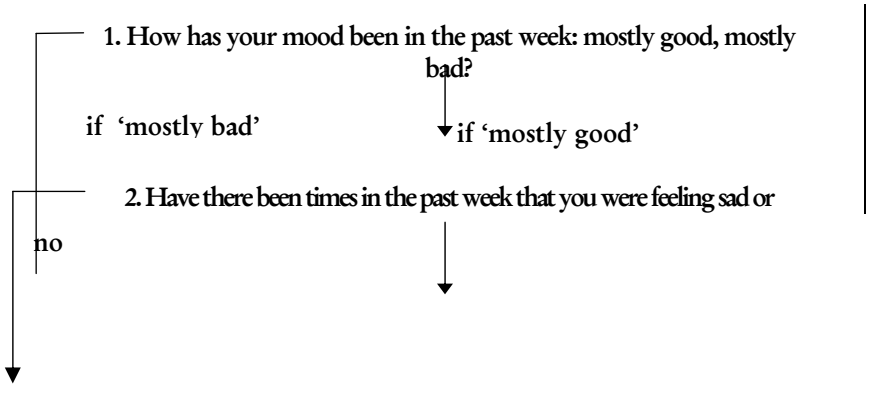


Data on **SOMATIC CONCERN.**



notes

Data on **DEPRESSION.**



notes

unhappy?

yes

→ 3. Is there something in particular that is making you sad?

Go to next section

notes

4. How often do you feel sad?

5. Just how sad have you been feeling?

6. Have you been crying lately?

7. Has your mood in any way affected your sleep?

8. Has it affected your appetite?

9. Do you participate less in activities on account of your mood?

10. Have you had any thoughts of harming yourself?

11. Any thoughts about ending your life?

yes

no

12. Have you attempted suicide?

Go to next section

Data on **GUILT FEELINGS** and **GRANDIOSITY.**

same (go to Q5)

notes

1. If you were to compare yourself to the average person, how would you come out: a little better, maybe a little worse, or about the same?

worse

2. Worse in what ways?

better

3. Just how do you feel about yourself? (go to Q5)

4. Better in what ways? (go to Q5)

notes

5. Are you special in some ways?

yes

6. In what ways?

no

7. Would you consider yourself gifted?

8. Do you have talents or abilities that most people don't have?

yes

no

9. Please explain.

10. Do you have any special powers?

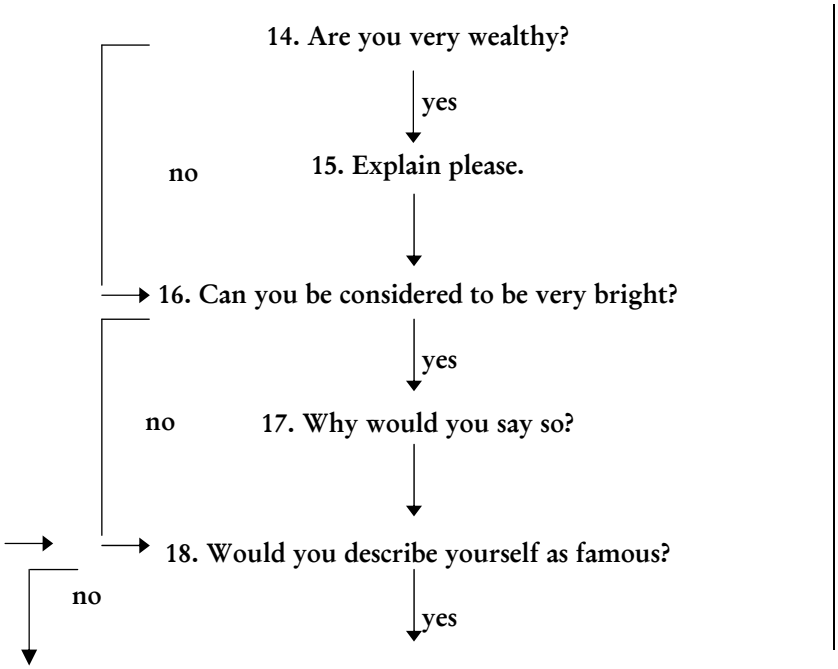
no

yes

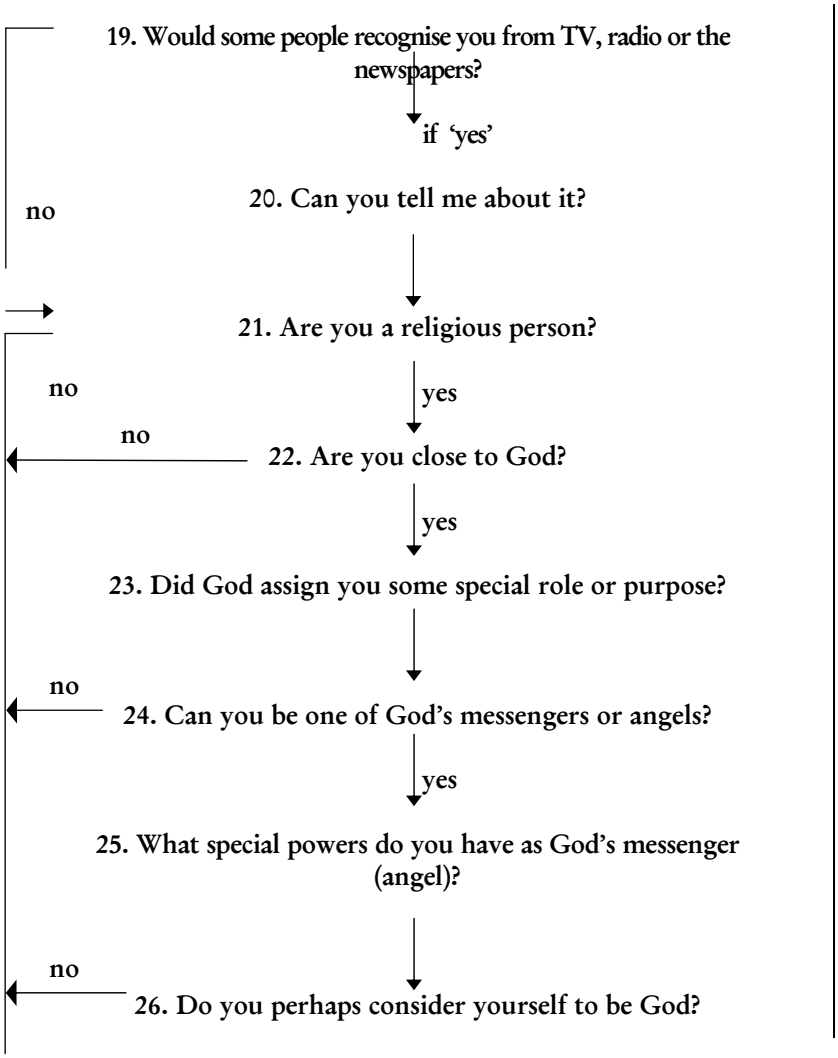
11. What are these?

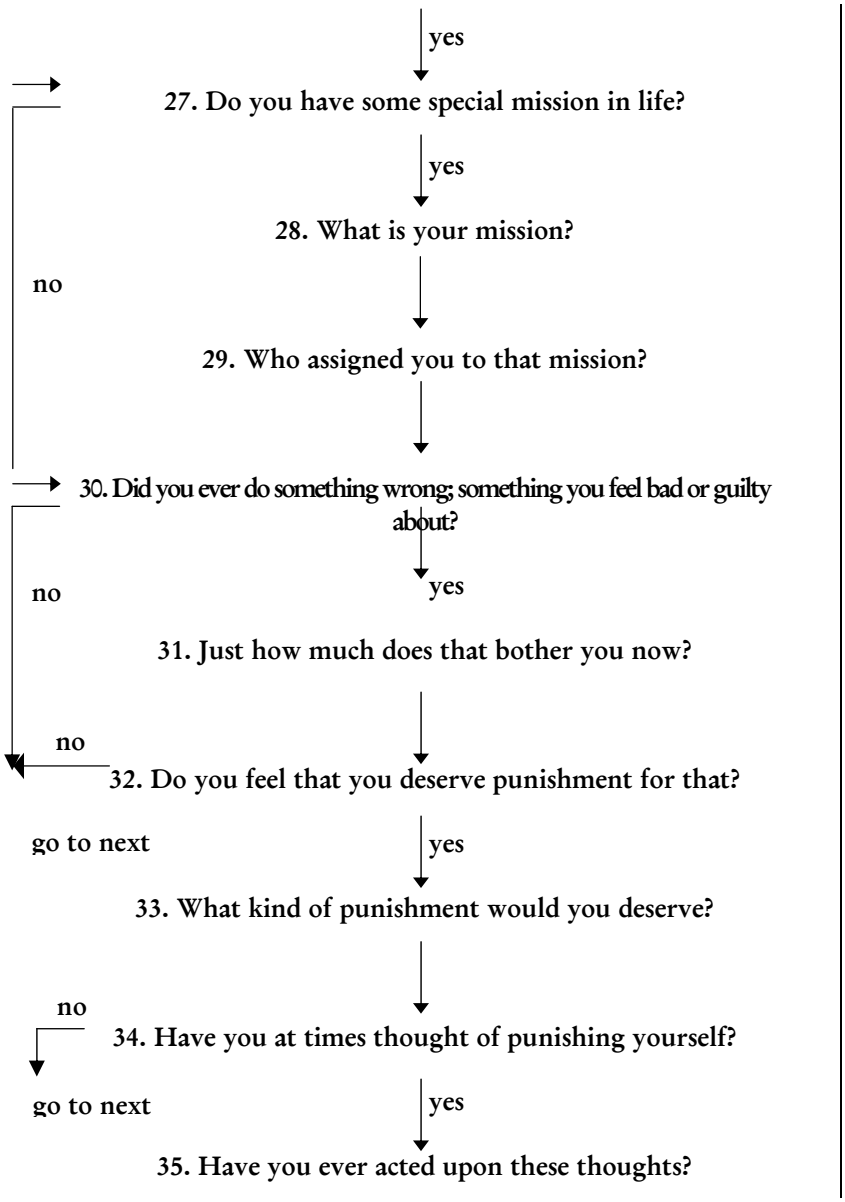
12. Where do these powers come from?

13. Do you have extrasensory perception (ESP), or can you read other people's minds?


14. Are you very wealthy?
yes
no
15. Explain please.
16. Can you be considered to be very bright?
yes
no
17. Why would you say so?
18. Would you describe yourself as famous?
no
yes
go to Q21

notes


19. Would some people recognise you from TV, radio or the newspapers?
if 'yes'
no
20. Can you tell me about it?
21. Are you a religious person?
no
yes
no
22. Are you close to God?
yes
23. Did God assign you some special role or purpose?
no
24. Can you be one of God's messengers or angels?
yes
25. What special powers do you have as God's messenger (angel)?
no
26. Do you perhaps consider yourself to be God?



notes

Data on **DISORIENTATION.**

1. Can you tell me what is today's date (i.e. the day, the month, the year)?

notes

2. What is the name of the place you are in now?

3. (If hospitalised) What ward are you on?

4. (If hospitalised) What is the address of where you now stay?

5. If someone had to reach you by phone, what number would they call?

6. What is the name of the doctor who is treating you?

7. (If hospitalised) Can you tell me who else in on the staff and what they do?

8. Do you know who is now the Prime Minister?

9. Who was the Prime Minister before?

10. Who is the leader of the opposition party?

Data on **DIFFICULTY IN ABSTRACT THINKING.**

notes

1. I'm going to now say a pair of words, and I'd like you to tell me in what important way they are alike. Lets start for example, with the words ... see Appendix A. How are they alike- what do they have in common?

if any other answer

if correct answer

2. Good. Now what about....? (Select three other items from the similarities list at varying levels of difficulty and based upon the interview stage and record the responses. Then go to Q4)

→ (If we use 'apple & banana' as the items) The incorrect answer will be either CONCRETE ('they both have skins' or 'you can eat them'), TANGENTIAL ('they're small), or IDIOSYNCHRATIC ('monkeys like them') – record this in the notes section to the left.

3. Okay, but they're both... give answer. Now how about ... : how are these alike? (Select three other items from the similarities list at varying levels of difficulty and based upon the interview stage and record the responses.)

4. You've probably heard the expression... select proverb from Appendix B. What does this really mean?

5. What about when people say... select second proverb from Appendix B. What do they mean?

6. There's a very old saying... see Appendix B for third proverb. What is the deeper meaning of this proverb? (Select 1 other proverb from the final set in Appendix B)

Data on **LACK OF JUDGEMENT and INSIGHT.**

notes

1. How long have you been in the hospital (clinic etc)?

2. Why did you come to the hospital (Clinic, etc)?

yes

3. Do you need to be in the hospital (Clinic, etc)?

go to Q5

No

no

4. Did you have a problem that needed treatment?

go to Q8

Yes

notes

5. Would you say that you had a psychiatric or mental problem?

Yes

6. Why... would you say that you had a psychiatric or mental problem?

no

7. Can you tell me about it and what it consists of?

8. In your opinion do you need to be taking medicine?

yes

no

9. (If medicated) Why are you then taking medicines? (go to Q11)

OR

10. (If unmedicated) Why are you still in hospital (clinic, etc)? (go to Q12)

11. Why?... Does the medicine help you in any way?

12. Do you at this time have any psychiatric or mental problems?

13. For what reason are you still in the hospital (clinic, etc)?

if reason given

if no reason given

14. Please explain.

15. Just how serious are these problems?

16. (If hospitalised) Are you ready for discharge from the hospital?

17. Do you think you will be taking medicine for your problem after discharge?

18. What are your future plans?

19. What about your longer-range goals? ... Well that's about all I have to ask of you now. Are there any questions that you might like to ask of me? ... Thank you for your co-operation

Appendix A: Items for assessing SIMILARITIES in the evaluation of **DIFFICULTY IN ABSTRACT THINKING.**

2-year assessment **Baseline/6mth assessment** **1-year/Discharge/18mth assessment** **Acute ward assessment**	1. How are a ball and orange alike? 2. Apple and banana? 3. Pencil and pen? 4. Nickel and dime?
2-year assessment **Baseline/6mth assessment** **1-year/Discharge/18mth assessment** **Acute ward assessment**	5. Table and chair? 6. Tiger and elephant? 7. Hat and shirt? 8. Bus and train?
2-year assessment **Baseline/6mth assessment** **1-year/Discharge/18mth assessment** **Acute ward assessment**	9. Arm and leg? 10. Rose and tulip? 11. Uncle and cousin? 12. The sun and the moon?
2-year assessment **Baseline/6mth assessment** **1-year/Discharge/18mth assessment** **Acute ward assessment**	13. Painting and poem? 14. Hilltop and valley? 15. Air and water? 16. Peace and prosperity?

Appendix B: Items for assessing PROVERB INTERPRETATION in the evaluation of **DIFFICULTY IN ABSTRACT THINKING.**

What does the saying mean:

2-year assessment **Baseline/6mth assessment** **1-year/Discharge/18mth assessment** **Acute ward assessment**	1. "Plain as the nose on you face"? 2. "Carrying a chip on your shoulder"? 3. "Two heads are better than one"? 4. "Two many cooks spoil the broth"?
2-year assessment **Baseline/6mth assessment** **1-year/Discharge/18mth assessment** **Acute ward assessment**	5. "Don't judge a book by its cover"? 6. "One man's food is another man's poison"? 7. "All that glitters is not gold"? 8. "Don't cross the bridge until you come to it"?
2-year assessment **Baseline/6mth assessment** **1-year/Discharge/18mth assessment** **Acute ward assessment**	9. "What's good for the goose is good for the gander"? 10. "The grass always looks greener on the other side"? 11. "Don't keep all your eggs in one basket"? 12. "One swallow does not make a Summer"?
2-year assessment **Baseline/6mth assessment** **1-year/Discharge/18mth assessment** **Acute ward assessment**	13. "A stitch in time saves nine"? 14. "A rolling stone gathers no moss"? 15. "The acorn never falls far from the tree"? 16. "People who live in glass houses should not throw stones at others"?

Panss Rating Form Name Date __

		absent	minimal	mild	moderate	moderate severe	severe	extreme
P1	Delusions	1	2	3	4	5	6	7
P2	Conceptual disorganisation	1	2	3	4	5	6	7
P3	Hallucinatory behaviour	1	2	3	4	5	6	7
P4	Excitement	1	2	3	4	5	6	7
P5	Grandiosity	1	2	3	4	5	6	7
P6	Suspiciousness/persecution	1	2	3	4	5	6	7
P7	Hostility	1	2	3	4	5	6	7
N1	Blunted affect	1	2	3	4	5	6	7
N2	Emotional withdrawal	1	2	3	4	5	6	7
N3	Poor rapport	1	2	3	4	5	6	7
N4	Passive/apathetic social withdrawal	1	2	3	4	5	6	7
N5	Difficulty in abstract thinking	1	2	3	4	5	6	7
N6	Lack of spontaneity & flow of conversation	1	2	3	4	5	6	7
N7	Stereotyped thinking	1	2	3	4	5	6	7
G1	Somatic concern	1	2	3	4	5	6	7
G2	Anxiety	1	2	3	4	5	6	7
G3	Guilt feelings	1	2	3	4	5	6	7
G4	Tension	1	2	3	4	5	6	7
G5	Mannerisms & posturing	1	2	3	4	5	6	7
G6	Depression	1	2	3	4	5	6	7
G7	Motor retardation	1	2	3	4	5	6	7
G8	Uncooperativeness	1	2	3	4	5	6	7
G9	Unusual thought content	1	2	3	4	5	6	7
G10	Disorientation	1	2	3	4	5	6	7
G11	Poor attention	1	2	3	4	5	6	7
G12	Lack of judgement & insight	1	2	3	4	5	6	7
G13	Disturbance of volition	1	2	3	4	5	6	7
G14	Poor impulse control	1	2	3	4	5	6	7
G15	Preoccupation	1	2	3	4	5	6	7
G16	Active social avoidance	1	2	3	4	5	6	7

APPENDIX 6

CALGARY DEPRESSION SCALE (CDS)

THE CALGARY DEPRESSION SCALE

General Instructions

The Calgary Depression Scale is specifically designed for assessment of level of depression in people with schizophrenia. It was originally derived from two widely used instruments, the Present State Examination and the Hamilton Depression Rating Scale, using factor and reliability analysis techniques. Its reliability and validity was further tested on a separate sample using confirmatory factor analyses and discriminatory analysis.

The scale is designed to reflect the presence of depression exclusive of other dimensions of psychopathology in schizophrenics at both the acute and residual stages of the disorder. It is sensitive to change, and can be used at a variety of intervals.

The rater should have experience with schizophrenics and should develop inter-rater reliability with another rater experienced in the use of structured assessment instruments. An experienced rater should develop adequate inter-rater reliability within 5-10 practice interviews.

The interview consists of eight structured questions followed by one observation item. This last item depends on the observation of the entire interview.

For further information contact: Dr D. Addington, Department of Psychiatry, Foothills Hospital, 1403-29 St NW Calgary, Alberta T2N 2T9, Canada.

Interview guide for Calgary Depression Scale for schizophrenics

Interviewer: ask the first question as written. Use follow-up probes of qualifiers at your discretion.

Time frame refers to last two weeks unless stipulated.
NB. The last item, number 9, is based on observations of the entire interview.

1. Depression

How would you describe your mood over the last two weeks?

Do you keep reasonably cheerful or have you been very depressed or low spirited recently?

In the last two weeks how often have you (own words) every day? All day?

0. Absent

1. Mild — Express some sadness or discouragement on questioning.

3. Severe — Persistent sense of being accused. When challenged acknowledges that it is *not* so.

5. Pathological guilt

Do you tend to blame yourself for little things you may have done in the past?
Do you think you deserve to be so concerned about this?

0. Absent

1. Mild — Subject sometimes feels over guilty about some minor peccadillo, but less than 50% of time.

2. Moderate — Subject usually (over 50% of time) feels guilty about past actions, the significance of which he/she exaggerates.

3. Severe — Subject usually feels he/she is to blame for everything that has gone wrong, even when not his/her fault.

6. Morning depression

When you have felt depressed over the last two weeks; have you noticed the depression being worse at any particular time of day?

0. Absent — No depression

1. Mild — Depression present but no diurnal variation.

2. Moderate — Depression spontaneously mentioned to be worse in morninng.

3. Severe — Depression markedly worse in morning, with impaired functioning which improves in afternoon.

7. Early wakening

Do you wake earlier in the morning than is normal for you?
How may times a week does this happen?

0. Absent — No early wakening.

1. Mild — Occasionally wakes (up to twice weekly) one hour or more before normal time to wake or alarm time.

2. Moderate — Often wakes early (up to five times weekly) one hour or more before normal time to wake or alarm.

3. Severe — Daily wakes one hour or more before normal time.

Suicide

Have you felt that life wasn't worth living?
Did you ever feel like ending it all?
What did you think you might do?
Did you actually try?

0. Absent

1. Mild — Frequent thoughts of being better off dead, or occasional thoughts of suicide.

2. Moderate — Deliberately considered suicide with a plan, but made no attempt.

3. Severe — Suicidal attempt apparently designed to end in death (i.e. accidental discovery or inefficient means).

9. Observed depression

Based on interviewer's observations during the entire interview.

The question "Do you feel like crying?" used at appropriate points in the interview, may elicit information useful to this observation.

0. Absent

1. Mild — Subject appears sad and mournful even during parts of the interview involving affectively neutral discussion.

2. Moderate — Subject appears sad and mournful throughout the inteview, with gloomy monotonous voice and is tearful or close to tears at times.

3. Severe — Subject chokes on distressing topics, frequently sighs deeply and cries openly, or is persistently in a state of frozen misery.

Calgary Depression Scale

Subject identification:

Interviewer:

Date:

		Absent	Mild	Moderate	Severe
1.	Depressed mood.	0	1	2	3
2.	Hopelessness	0	1	2	3
3.	Self-depreciation	0	1	2	3
4.	Guilty ideas of reference	0	1	2	3
5.	Pathological guilt	0	1	2	3
6.	Morning depression	0	1	2	3
7.	Early wakening	0	1	2	3
8.	Suicide	0	1	2	3
9.	Observed depression	0	1	2	3

APPENDIX 7

SECTION B OF THE MAUDSLEY ADDICTION PROFILE (MAP)

MAP (Marsden et al., 1998): "The next questionnaire asks about your substance use and various aspects of your life during the past 30 days".

SECTION B: SUBSTANCE USE

(A) ENTER WHETHER USED IN PAST 30 DAYS
(B) [CARD 1] RECORD NUMBER OF DAYS USED IN PAST 30 DAYS
(C) ENTER AMOUNT USED ON TYPICAL USING DAY IN PAST 30 DAYS
(D) RECORD ROUTE(S) OF ADMINISTRATION

Note: record grams/money equivalent for amount consumed; probe fully for alcoholic drinks and record type(s), brand, size (e.g. small/large can; pint/half pint; size measures for spirits)

FREQUENCY OF USE IN THE PAST 30 DAYS

1 day only	2 days only	3 days only	Once every week	2 days a week	3 days a week	4 days a week	5 days a week	6 days a week	Every day
1	2	3	4	9	13	17	21	26	30

Oral	Snort/sniff	Smoke/chase	Intravenous
1	2	3	4

TYPE	✓ X	Days	AMOUNT ON TYPICAL DAY IN PAST 30 DAYS	Route(s)
1. ALCOHOL				
2. CANNABIS				
3. HEROIN				
4. ILLICIT METHADONE			Describe formulation (s): liquid/ tablets/ampules	
5. ILLICIT BENZODIAZEPINES specify				
6. COCAINE POWDER				
7. CRACK/ROCK COCAINE				
8. AMPHETAMINES				
9. OTHER (specify)				

Case No

APPENDIX 8

SEVERITY OF DEPENDENCE SCALE (SDS)

SEVERITY OF DEPENDENCE SCALE

ID Number	
Team/Locality	
Date:	

Please think of your use of ..... [insert name of drug] *during a typical recent period of using when you answer these questions. Please answer by circling one response only.*

1. **Did you think that your use of** [*insert name of drug*] **was out of control?**

Never/ Almost never	Sometimes	Often	Always/ Nearly always
(0)	(1)	(2)	(3)

2. **Did the prospect of missing a fix (or dose) or not chasing make you anxious or worried**?

Never/ Almost never	Sometimes	Often	Always/ Nearly always
(0)	(1)	(2)	(3)

3. **Did you worry about your use of** *[insert name of drug]*

Never/ Almost never	Sometimes	Often	Always/ Nearly always
(0)	(1)	(2)	(3)

4. **Did you wish you could stop?**

Never/ Almost never	Sometimes	Often	Always/ Nearly always
(0)	(1)	(2)	(3)

5. **How difficult did you find it to stop, or go without** *[insert name of drug]***?**

Not Difficult	Quite Difficult	Very Difficult	Impossible
(0)	(1)	(2)	(3)

APPENDIX 9

GUIDELINES FOR AUTHORS TO SUBMIT TO

'SCHIZOPHRENIA RESEARCH'