

## REVIEW ARTICLE

# The Effects of Cognitive Therapy on Hallucinations in Patients with Schizophrenia

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## INTRODUCTION

Cognitive therapy was initially developed by Aaron Beck in the 1960s as a short-term psychotherapy for depression (1). It was based on his findings that people suffering from depression exhibit altered cognition along common themes such as low self-esteem, ideas of deprivation, self-criticisms, magnification of problems, self-commands to accomplish tasks which are often large-scale and mutually exclusive, and thoughts of escaping from life's problems. In addition, they tend to employ cognitive distortions such as arbitrary interpretation, selective abstraction, overgeneralization, magnification, minimization, and inexact labelling. These underlying themes and distortions lead to automatic and involuntary depressing and self-deprecating thoughts in various situations, which in turn lead to emotions such as sadness, anger, embarrassment, and anxiety. Beck postulated that depression could be treated through identification and correction of the patient's idiosyncratic cognitions and underlying depressive themes (2). Since then the cognitive model of therapy has expanded to include treatment of many psychopathologies including schizophrenia. This model suggests that cognitive distortions underlie both mood and behaviour in all psychopathologies; cognitive therapy targets and alters these underlying distortions leading to symptomatic improvement (3).

Schizophrenia is a psychotic disorder characterized by two or more of the following for a 1-month period: delusions, hallucinations, disorganized speech, grossly disorganized or catatonic behaviour, and negative symptoms (i.e. affective flattening, alogia, or avolition). Continuous signs of

disturbance must be present for at least 6 months, which may include prodromal and residual symptoms in addition to the 1 month of active-phase symptoms (4). While antipsychotic medications are often effective in diminishing symptoms, 10-60% of patients with schizophrenia respond poorly or incompletely to typical antipsychotics and 20-30% of patients taking typical antipsychotics as prescribed will relapse within the first year of maintenance treatment (5). Furthermore, medication non-compliance is a significant barrier to treatment in this population. The Clinical Antipsychotic Trials of Intervention Effectiveness (CATIE) showed that 74% of patients discontinued their antipsychotic medication before 18 months, with discontinuation rates ranging from 64%-82% for various antipsychotics (6). Ayuso-Gutierrez et al. report that 73% of schizophrenia exacerbations requiring hospitalization occurred in patients who were non-compliant with medication (7). As such, adjuvant interventions such as cognitive therapy may be beneficial in treating symptoms that are incompletely responsive to pharmacological treatment or in patients who are non-compliant to pharmacological therapy.

While schizophrenia symptoms include delusions and hallucinations which may be differentially responsive to cognitive therapy, the disease differs from depressive disorders in that patients with schizophrenia have significant impairment in reality testing and often have a considerable lack of insight (8). These characteristics seem to be in direct opposition to those required for cognitive therapy as recognition of faulty cognition is central to its success. A review of various models of schizophrenia is therefore required to understand the aspects of schizophrenia that are amenable to cognitive therapy.

It is widely accepted that schizophrenia is a disorder of dopamine hyperactivity (8), but exactly

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how this hyperactivity creates symptoms of schizophrenia is yet to be elucidated. Kapur's theory of psychosis as a state of aberrant salience builds on research that the mesolimbic dopamine system assigns salience to experienced events and thoughts and transforms them from neutral occurrences to significant entities. Kapur hypothesises that the increase in dopamine in the mesolimbic system of patients with schizophrenia creates inappropriate salience for both internal and external events. Delusions and disorganized thinking in turn result in an attempt to organize disconnected but seemingly salient events into coherent stories (9).

In their literature review, Bentall, Kinderman, and Kaney examine the cognitive distortions in patients with persecutory delusions such as increased attention to threat, a tendency towards external attributions for negative life events, and increased self-esteem when compared to both depressed subjects and controls. They hypothesize that persecutory delusions may be a form of protection from negative information about the self by attributing such information to an external source, thus preserving a positive self-image (10).

Cognitive theories of hallucinations have tended to focus on auditory hallucinations, suggesting that they are related to a defect in speech processing. Inconsistent evidence exists for the claim that sub-vocal activity accompanies auditory hallucinations. Gould showed that patients experiencing auditory hallucinations have greater muscular potentials in vocal muscles compared to controls, as measured by electroencephalograph (11). Green and Kinsbourne were unable to replicate these findings. In addition, they had inconclusive results regarding the effects of decreasing sub-vocalizations on auditory hallucinations: humming decreased the number of self-reported auditory hallucinations by 59% while biting the tongue and holding the mouth open was not associated with a significant reduction (12). The relation of auditory hallucinations to sub-vocalization has led to the interpretation that such hallucinations are self-generated vocalizations misinterpreted as coming from an external source (13). Consistent with this explanation, in his literature review Bentall examines various theories of hallucinations and concludes that a common theme is the misattribution of self-generated thoughts to an external source (14).

Paralleling Beck's notion that it is one's perception of a situation that governs emotion rather than the situation itself, Chadwick and Birchwood found that patients' emotional reaction during audi-

tory hallucinations was related to their perception of the quality of the voice (malevolent versus benevolent). Malevolent voices triggered anger, fear, depression, and anxiety and benevolent voices triggered amusement, reassurance, calmness, and happiness. Similarly, patients' perceptions of the auditory hallucinations influenced active engagement with or resistance to the hallucination (15).

It is intuitive that delusions may be treated with cognitive therapy as they are distorted beliefs based on misattributions. Following Beck's model, the abnormal cognitions behind the delusional belief can be targeted during therapy. Hallucinations, however, are sensory perceptions rather than faulty cognitions which intuitively makes them less amenable to eradication through cognitive therapy as they are experienced events. Abolishing hallucinations is therefore not the goal of cognitive therapy. Instead, the objective is diminishing the emotional effects that hallucinations have on the patient. This paper reviews a subset of the existing literature on the efficacy of cognitive therapy in treating hallucinations in schizophrenic patients.

## METHODS

Articles were identified in Medline using "cognitive therapy", "schizophrenia", and "hallucinations" as search terms which were mapped to subject heading and exploded. The results for these three searches were combined and then limited to randomized control trials, yielding 13 articles. Four articles were not included as they did not investigate the effects of cognitive interventions on hallucinations in schizophrenia. One additional article was obtained via manual search of references in the above articles.

## REVIEW

The studies examined in this review belong to three main categories: randomized controlled trials looking at individual cognitive therapy, group cognitive therapy, and hallucination-integrated-therapy (HIT).

### *Individual Cognitive Therapy*

Positive results were found by England for the effects of individual cognitive therapy on "psychiatric symptoms" in voice hearers (16). Individual cognitive therapy was administered by nursing staff to out-patients with schizophrenia and schizoaffective disorder who suffered from auditory hallucinations, in twelve 90-minute sessions over 4 months. This intervention was associated with a significant

decrease in psychiatric symptoms as measured by total score on the Brief Psychiatric Rating Scale (BPRS) at both 18 and 54 weeks, compared to patients who received usual care. A significant between-group difference was also found for self-esteem as measured by the Robson Self-Concept, a questionnaire that measures self-appraisals in various domains: patients who received the cognitive intervention showed a larger increase in self-esteem as compared to patients who received usual care. Of note, the BPRS includes hallucination severity in its measures but the authors do not specify if hallucination severity in particular is a variable that significantly decreased during the course of treatment. Therefore, these results show only that the cognitive intervention was associated with a decrease in total psychiatric symptoms in patients who hear voices. It can not be concluded that voice characteristics (i.e. loudness, frequency, volume, content) or patient reaction to voices (i.e. distress, compliance) were affected by the treatment.

Trower et al., on the other hand, found promising results for the effects of cognitive therapy specifically on command hallucination compliance in patients with schizophrenia spectrum disorders (17). Cognitive therapy for command hallucinations (CTCH) plus treatment as usual was compared to treatment as usual (TAU) alone in subjects at high risk for command compliance. CTCH was developed by the authors according to the doctrine of social rank theory, which suggests that the appraisal of social subordination and of the power differential between an individual and his persecutor may originate in the individual's appraisal of the social ranking of both the individual and the persecutor (18). Consistent with this theory, the cognitive intervention focused on altering subject perception of voice power and ability to self-direct behaviour rather than on decreasing the frequency or characteristics of the auditory experience. Effect of treatment was evaluated at 6 and 12 months. While both groups showed decreased compliance to commands at both 6 and 12 months, the decrease in the cognitive therapy group was larger (a decrease in partial to full compliance from 100% to 14% after 6 months versus 94% to 39%). While the TAU group showed no change in perceived voice power, voice omniscience, and perceived control over voices, the CTCH group showed a significant decrease in perceived voice power and omniscience, as well as a significant increase in perceived control over commands. These changes persisted at the 12 month follow-up. Of note, the inter-group discrepancy in

compliance behaviours at 6 and 12 months was non-significant when using perceived voice power as a covariate, suggesting that perceived voice power is a key factor in governing patient compliance. Further supporting this notion is the fact that voice content did not change in either group, and while perceived voice frequency diminished in the CTCH group at 6 months this decrease was not maintained at 12 months. Therefore, decreased compliance in the CTCH group can not be attributed to changes in voice frequency or content. The CTCH group also experienced a significant decrease in total positive symptoms, negative symptoms, and general psychopathology compared to the TAU group. These results were maintained at 12 months. While distress decreased significantly in the CTCH group at 6 months, this was not maintained at 12 months. Similarly, hallucinations were reduced non-significantly in the CTCH group at 6 months compared to the TAU group, but this difference was no longer present at 12 months.

Tarrier et al. compared two distinct cognitive interventions in schizophrenia patients with medication-refractory psychotic symptoms: coping strategy enhancement (CSE) and problem solving (PS) were compared after 5 weeks of treatment and at 6 months follow-up (19). Coping strategy enhancement involved the identification of existing coping strategies and the use of these pre-existing strategies to outline numerous coping techniques with the aim of coping and controlling both cues and reactions to psychotic symptoms. The authors hypothesized that CSE would improve psychotic symptoms thus decreasing general psychopathology and improve functioning while PS would improve functioning with no specific effects on psychotic symptoms. While all patients receiving treatment showed a significant decrease in number of symptoms and total symptom severity, there was a significant interaction effect of group and time on total symptom severity and a near-significant interaction effect on number of symptoms: the patients receiving CSE showed more change during the treatment period than did the patients receiving PS. Of note, the CSE group exhibited a significant decrease in delusions and a trend towards a decrease in anxiety as measured by the Psychiatric Assessment Scale (PAS) when compared to the PS group. There were no significant changes, however, for the hallucinations subscale. Social functioning was not affected in either group. See Table 1 for a summary of the effects of individual cognitive therapy on patients with hallucinations.

Author	Study Population (n=)	Diagnosis	Experimental Intervention	Significant Outcomes
England (2007)	65	- Schizophrenia - Schizoaffective disorder	Cognitive nursing intervention	- ↓ psychotic symptoms (p<0.0001) - ↑ self-esteem (p<0.001)
Trower et al. (2004)	38	- Schizophrenia spectrum	Cognitive therapy for command hallucinations (CTCH)	<b>At 12 months:</b> - ↓ command compliance (p<0.001) - ↓ perceived voice power (p<0.001) - ↓ voice omniscience (p=0.02) - ↓ perceived control over voices (p=0.01) - ↓ positive symptoms (p=0.001) - ↓ negative symptoms (p=0.002) - ↓ general psychopathology (p=0.001) <b>At 6 months only:</b> - ↓ distress (p=0.03) - ↓ voice frequency (p=0.022)
Tarrier et al. (1993)	27	- Schizophrenia	Coping strategy enhancement (CSE) vs. problem solving (PS)	- ↓ in number of symptoms for both groups (p=0.0048) - ↓ in symptom severity for both groups (p=0.0013), significantly greater with CSE (p=0.02) - ↓ in delusions with CSE (p=0.019).

**Table 1:** Effects of Individual Cognitive Therapy on Patients with Hallucinations

### Group Cognitive Therapy

Cognitive therapy is a highly specialized form of therapy but is often inaccessible to patients due to factors such as cost or significant wait lists. If group therapy is proven to be beneficial in treating hallucinations in patients with schizophrenia, cognitive intervention can be applied to a larger population.

McLeod et al. found that patients with schizophrenia receiving group cognitive behavioural therapy over 8 weeks showed a significant reduction in voice frequency and in perceived voice power, as well as a trend towards distress reduction at 12 weeks when compared to patients receiving treatment as usual (20;21). It is unclear, however, if these benefits were due to the cognitive behavioural intervention itself, which was aimed at providing patients with a range of coping strategies, or simply to receiving treatment in a group setting.

A study by Penn et al. investigated the effects of cognitive behavioural therapy versus group supportive therapy (ST) on hallucinations in patients with schizophrenia and schizoaffective disorder

post-treatment and at 3 and 12 months follow-up, thus controlling for the fact that benefits can be attributed solely to a group setting (22).

Contrary to the authors' hypothesis, the ST group perceived their auditory hallucinations as significantly less malevolent and showed a trend towards decreased resistance of voices compared to patients in the CBT group, both at 3 and 12 months follow-up. Patients in the CBT group, however, had significantly lower total and general symptoms and a near significant decrease in positive symptoms as measured by the Positive and Negative Syndrome Scale (PANSS) and non-significantly higher levels of insight, but showed no change in voice distress or intensity. These results remained stable from 3 to 12 months follow up.

Of note, the CBT intervention did not attempt to target and modify cognitions surrounding voices, but rather was aimed at increasing coping capability. This may account for the lack of change in patients' perception of voices and concomitant general improvement, an explanation noted by the authors.

Similarly, Wykes et al. found that 7 sessions of group CBT led to a significant improvement in social behaviour at 36 weeks as compared to treatment as usual in a sample of patients with schizophrenia, but neither treatment had any effects on self reported measures of distress and voice topography assessments, such as frequency and loudness, as measured by the psychotic symptom rating scale (PSYRATS). Of note, a cluster effect of therapy on the PSYRATS score was noted, indicating that changes in PSYRATS scores varied between therapy groups. A non-significant association was found between decreased PSYRATS score and both therapist expertise and receiving treatment early in the trial (23).

#### Hallucination Integrated Therapy

Hallucination-integrated-treatment (HIT) includes several therapeutic modalities: cognitive behavioural therapy, coping training, family treatment, rehabilitative intervention, mobile crisis intervention, antipsychotic medication, and attitudinal and motivational techniques. Of note, HIT differs from other cognitive behavioural interventions in that patients and relatives alike receive the intervention (24).

HIT has been shown to have a significant effect in improving various domains in patients with schizophrenia spectrum disorder suffering from auditory hallucinations when compared to treatment as usual after 9 and 18 months (24;25). In one study, treatment as usual consisted of medication, monitoring and advice, patient and relative psycho-

education, and supportive counselling, while the HIT group underwent a median of 9 months and 11 contacts of HIT. Patient who received HIT showed a significant improvement in quality of life as measured by the World Health Organization Quality of Life Schedule (WHOQoL) at 9 months, which was no longer significant at 18 months. Conversely, both satisfaction with health and global change in Quality of Life score showed a trend towards improvement that became significant at 18 months follow-up. At both 9 and 18 months assessment, patients receiving HIT showed significant improvement in societal involvement, the household, relationship with family, relationship with partner, and as a parent, as measured by the Groningen Social Disabilities Scale (GSDS) (24). In a similar study, patients in both HIT and routine care groups showed decreases in measures of subjective burden at 18 months, significantly greater in the HIT group for negative content, distress, and total burden. HIT treated patients also showed significant improvement in positive symptoms and disorganization, and a trend towards significant improvement in depression, general psychopathology, and total PANSS score (25). These results show promising results with regard to overall functioning and quality of life, but again do not necessarily indicate hallucination-specific effects of cognitive intervention.

Jenner et al investigated routine care versus HIT and found hallucination-specific results (26). HIT was given in approximately 20 one-hour

Author	Study Population (n=)	Diagnosis	Experimental Intervention	Significant Outcomes
McLeod et al. (2007)	10	Schizophrenia	Group cognitive behavioral therapy	- ↓ voice frequency (p<0.01) - ↓ perceived voice power (p<0.01)
Penn et al. (2009)	65	Schizophrenia spectrum	Group cognitive behavioral therapy (CBT) vs. enhanced group supportive therapy (ST)	- ↓ voice malevolence with ST (p=0.044) - ↓ total symptoms with CBT (p=0.019) - ↓ general symptoms with CBT (p=0.02)
Wykes et al. (2005)	85	Schizophrenia	Group cognitive behavioral therapy	- Improvement in social behaviour (p=0.018)

**Table 2:** Effects of Group Cognitive Therapy on Patients with Hallucinations

Author	Study Population (n=)	Diagnosis	Experimental Intervention	Significant Outcomes
Wiermsa et al. (2004)	63	Schizophrenia spectrum	Hallucination integrated treatment	<ul style="list-style-type: none"> <li>- ↑ quality of life at 9 months (p&lt;0.05)</li> <li>- ↑ satisfaction with health at 18 months (p&lt;0.05)</li> <li>- ↑ total score of WHOQoL at 18 months (p&lt;0.05)</li> <li>- ↑ numerous domains of social functioning (p&lt;0.01-p&lt;0.05)</li> </ul>
Jenner et al. (2006)	63	Schizophrenia spectrum	Hallucination integrated treatment	<ul style="list-style-type: none"> <li>- ↓ total subjective burden (p=0.02)</li> <li>- ↓ negative content (p=0.02)</li> <li>- ↓ distress (p=0.01)</li> <li>- ↓ positive symptoms (p=0.05)</li> <li>- ↓ disorganization (p=0.01)</li> </ul>
Jenner et al. (2004)	76	Schizophrenia spectrum	Hallucination integrated treatment	<ul style="list-style-type: none"> <li>- ↓ distress (p&lt;0.05)</li> <li>- ↓ total burden (p&lt;0.05)</li> <li>- ↓ positive symptoms (p&lt;0.001)</li> <li>- ↓ disorganization (p&lt;0.05)</li> <li>- ↓ general psychopathology (p&lt;0.01)</li> <li>- ↓ total PANSS score (p&lt;0.01)</li> </ul>

**Table 3:** Effects of Hallucination Integrated Treatment on Patients with Hallucinations

sessions over 9-12 months in patients with schizophrenia spectrum disorders suffering from auditory hallucinations. Routine care was given in an equal number of contacts and total contact time and post-treatment effects were measured at 9 months. While patients in both groups showed decreased severity in the Auditory Hallucination Rating Scale (AHRs), the HIT group showed a significant decrease in distress and total burden on the AHRs as compared to the routine care group. Furthermore, the HIT group showed a significant improvement in PANSS positive symptoms, disorganization, general psychopathology, and total score as compared to the routine care patients. Depression levels showed more improvement in the HIT group as well but did not reach significance. While HIT focused on decreasing the number of applied coping strategies to promote consistent strategy use, patients in the HIT group showed a non-significant decrease in number of coping strategies compared to those with routine care and showed a greater use of empowerment and normalization post-treatment (70% and 57% respectively).

## DISCUSSION

Taken together, these studies yield equivocal results regarding hallucination specific outcomes from both individual and group cognitive interventions, as well as from HIT. This lack of consistent results may be due to insufficient study power to detect small to moderate differences between groups. At the same time, these results may also be attributed to the fact that cognitive behavioural therapy and HIT have many components. Some of these components may not focus on hallucinations per se, which can account for the lack of hallucination-specific effects and simultaneous positive outcomes in other areas. Future research that focuses on treating characteristics of and patient reaction to hallucinations, similar to the research conducted by Trower et al (17), may yield more promising results. For example, in patients who hear self-deprecating voices, subjective levels of distress can be evaluated following an intervention that targets patients' perception of content validity. Similarly, in patients who hear voices that encourage or discourage behaviours based on contingent outcomes (i.e. if you do X, Y will happen), patient behaviour can be eval-

uated following an intervention that targets patients' perception of voice omniscience.

On the other hand, the effects of decreasing total, positive, and general symptoms and improving socialization and subjective quality of life should not be dismissed. Patients with schizophrenia tend to be isolated. In a sample of 74 out-patients with schizophrenia, 16.2% lived with a spouse or child, 8.1% lived with an extra-marital partner, 37.8% lived alone, and 31.1% lived with parents. The remainder lived in rehabilitation centres or hostels. A majority (63.5%) of the sample was single, with only 57% of patients interacting with non-relatives (27). Therefore, interventions that are successful in improving social behaviour may prove to be beneficial in this isolated population as they may lead to increased socialization and decreased isolation. Furthermore, Curson et al. showed a high negative correlation between improvement in socialization as measured by the Social State Rating (SSR) and number of schizophrenia relapses in a 7 year follow-up study (28), and Rajkumar and Thara showed a significant difference in number of social contacts of patients with schizophrenia who suffered a relapse as compared to those who did not (2.31 and 4.27 respectively) in a 3 year prospective study (29). In addition, life satisfaction as measured by modified quality of life scales has been shown to be associated with suicide, with lower satisfaction levels increasing the suicide-risk in a 20-year follow up study of adults who were not selected based on mental health (30). It follows then that increasing socialization may decrease the risk of schizophrenia relapse while improving subjective quality of life may decrease suicide risk.

This review has several limitations. Firstly, it is not exhaustive of the randomized controlled trials on this subject. In addition, the articles reviewed did not all investigate the same treatments or populations despite being results of the same literature search; some articles included only patients with schizophrenia while others included the entire schizophrenia spectrum. Some articles examined cognitive therapy while others investigated hallucination-integrated treatment. It is also not possible to determine what components of a mixed-modality treatment such as HIT are responsible for any change in the experimental group. In the same vein, the application and content of cognitive therapy may differ between and within studies, as well as between patients and therapists. As a result, it becomes difficult to determine which aspects of a uni-modality treatment are therapeutic as treatment is both therapist and patient dependant.

The American Psychiatric Association defines recovery as "...a person's capacity to have hope and lead a meaningful life...The concept of recovery values include maximization of 1) each patient's autonomy based on that patient's desires and capabilities, 2) patient's dignity and self respect, 3) patient's acceptance and integration into full community life, and 4) resumption of normal development. The concept of recovery focuses on increasing the patient's ability to successfully cope with life's challenges, and to successfully manage their symptoms" (31). While the studies examined in this review do not show consistent hallucination-specific effects or complete eradication of symptoms as a result of cognitive interventions, they show that such interventions promote recovery as defined by the APA. Perhaps, then, the challenge that remains is not to find interventions that are hallucination-specific or that aim to eliminate symptoms, but rather to promote acceptance of this new definition of recovery.

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