



Command auditory verbal hallucinations in a culturally diverse early intervention in psychosis service: Prevalence, clinical associations and phenomenology

Elisavet Pappa^a, Ching So^{a,b}, Jennifer McGowan^a, Gabrielle Ng^{a,b}, Alysia Sweeney^b, Athina Servi^b, Charmayne Tsz Wing Lau^b, Rozhina Modaresi^b, Angel Yee Fong Au^b, Zuri Zhang^b, Simran Seera^b, Monica Huerga-Malillos^b, Ben Gaughan^b, Amber Gill^b, Emily Hickson^b, Anjeza Koruni^b, Amber Nomani^b, Harriet Allen^b, Hollie Edwards^b, Jacob Barnett^b, Faaizah Islam^b, Jonathan Souray^b, Vaughan Bell^{a,c,*}, David Raune^{b,1}

^a Clinical, Educational and Health Psychology, University College London, 1-19 Torrington Place, London, WC1E 7HB, UK

^b Central and North West London NHS Foundation Trust, 350 Euston Road, Regent's Place, London, NW1 3AX, UK

^c South London and Maudsley NHS Foundation Trust, Michael Rutter Centre, London, SE5 8AZ, UK

ARTICLE INFO

Keywords:

Service Evaluation
Quality improvement
Early intervention in psychosis services
Early course psychosis
First episode psychosis
Command auditory verbal hallucinations

ABSTRACT

Background: Command auditory verbal hallucinations (CAVH) are a subtype of auditory hallucinations perceived as instructing the hearer to perform specific actions, carrying an elevated risk of harm due to potential compliance with harmful behaviours. Despite the risk, the prevalence, clinical associations and content of CAVH in first episode psychosis (FEP) remain largely underexplored, leaving important gaps in risk assessment and early intervention during this critical illness phase.

Method: We conducted a retrospective content analysis of medical records from 740 culturally diverse FEP patients with AVH in an early intervention in psychosis service. Prevalence estimates were calculated for phenomenological predictors of CAVH and compliance, and logistic regression analyses were conducted to examine associations with clinical and demographic factors.

Results: Over half of patients (51.4%, $N = 380$) experienced CAVH, of which 75.0% ($N = 285$) involved harmful and/or life-threatening content, most commonly physical harm directed toward the self, but also others. Nearly one-third (32.1%) complied with commands. Compliance was associated with several phenomenological features, including supernatural or unfamiliar voices and commands directed toward relationally proximal recipients (e.g., family members), and occurred across bodily, psychological, and social domains. Harmful and/or life-threatening commands significantly predicted compliance, particularly when harm targeted the social sphere. Longer illness duration significantly predicted the presence of CAVH.

Conclusion: Findings suggest that CAVH are prevalent and clinically important in FEP, and that incorporating phenomenological predictors can inform compliance prediction. Detailed assessment of CAVH characteristics, combined with personalized early intervention and safeguarding, may help reduce the risk of harmful outcomes.

* Corresponding author at: 1-19 Torrington Place, London, WC1E 7HB, UK.

E-mail addresses: elisavet.pappa.16@ucl.ac.uk (E. Pappa), martin.so.21@ucl.ac.uk (C. So), jennifer.a.l.mcgowan@ucl.ac.uk (J. McGowan), gabrielle.yan.21@ucl.ac.uk (G. Ng), alysia.sweeney@nhs.net (A. Sweeney), athina.servi@nhs.net (A. Servi), charmayne.lau@nhs.net (C.T.W. Lau), rozhina.modaresi@nhs.net (R. Modaresi), angel.au.21@ucl.ac.uk (A.Y.F. Au), zcjzz1@ucl.ac.uk (Z. Zhang), s.seera@nhs.net (S. Seera), monica.huerga@nhs.net (M. Huerga-Malillos), amber.gill.2023@live.rhul.ac.uk (A. Gill), anjeza.koruni1@nhs.net (A. Koruni), amber.nomani@nhs.net (A. Nomani), harri.allan@nhs.net (H. Allen), hollie.edwards4@nhs.net (H. Edwards), jacob.barnett@nhs.net (J. Barnett), jonathan.souray1@nhs.net (J. Souray), vaughan.bell@ucl.ac.uk (V. Bell), david.raune@nhs.net (D. Raune).

¹ Joint senior authors.

1. Introduction

Auditory verbal hallucinations (AVH) are defined as the experience of hearing a voice in the absence of an external speaker (Wilkinson and Fernyhough, 2017) or, more broadly, as auditory verbal perceptions without an identified external auditory stimulus (Stanghellini and Cutting, 2003). AVH are hallmark diagnostic positive symptoms of psychotic disorders, including schizophrenia and schizoaffective disorder (American Psychiatric Association, 2013). Command auditory verbal hallucinations (CAVH) are a high-risk and distressing subtype of hallucinations in which voices instruct the hearer to perform specific actions, either through explicitly directive content or through interpretation as a command (Braham et al., 2004; Ellett et al., 2017; Shawyer et al., 2003). Estimates suggest that a quarter of individuals with first-episode psychosis (FEP) experience CAVH (Rajapakse et al., 2011; Uptegrove et al., 2016).

Research has consistently highlighted that risk is highest where compliance motivates violent or self-harmful behaviours (Barrowcliff and Haddock, 2006). In a retrospective study of patients in early intervention in psychosis services (EIPS), 32.2% of patients were identified as experiencing physical harm as a consequence of hallucinated voices and patients with self-harm-related CAVH were approximately 20 times more likely to have engaged in self-injurious behavior, while those hearing violent commands were about six times more likely to have harmed others (Hazell et al., 2024).

However, surprisingly, little is known about the broader phenomenology of CAVH in FEP. It remains unclear to what extent commands focus on different domains, e.g. the body, social sphere, or mental domains, to what extent commands involve the self, family, friends, or strangers, and how they vary according to the severity of the act demanded, and whether these characteristics are associated with differential compliance. These factors are likely to be clinically important components of risk assessment and safeguarding (Barrowcliff and Haddock, 2006; Fox et al., 2004; Rogers et al., 2002), although there is currently little evidence to help weight their relative significance.

This has important implications in FEP. The first three years following symptom onset represent a critical window for intervention, as timely and appropriate treatment can significantly reduce symptom severity, prevent relapse, and improve long-term outcomes, including lowering the risk of self-harm and violence (Birchwood et al., 1998; McGorry et al., 2008). Advancing insight in this area is essential for refining service provision to guide and enhance clinical care.

In light of these gaps, this large quality improvement study examined the prevalence, phenomenological characteristics, and clinical associations of CAVH and compliance in FEP patients attending the Harrow and Hillingdon EIPS. The study aimed to characterize CAVH's clinical presentation and phenomenological features linked to compliance risk (e.g., familiarity, identifiability, perceived power), and to evaluate whether demographic and clinical factors such as age, age at onset, diagnosis, duration of untreated psychosis (DUP), and psychosis illness length (PIL) were associated with CAVH and compliance. The overarching objective was to inform the detection, understanding, and management of CAVH within the service, aiming to enhance routine assessment practices to ensure that clinical correlates of CAVH and compliance are systematically identified.

2. Method

2.1. Setting and recruitment

The study was conducted within the Harrow and Hillingdon EIPS. Data were collected by assistant psychologists via review of patient health records as part of the Lived Experience Symptom Survey (LESS), an ongoing NHS registered quality improvement project (Hazell et al., 2024; Isaacson et al., 2022). The LESS project systematically records phenomenological data on delusions and hallucinations reported by

patients in the EIPS, with the aim of informing and enhancing clinical evaluation procedures.

All patients had a confirmed FEP diagnosis and were drawn from the full-service caseload. At the time of the LESS computerized health record assessment, patients were either engaged with the service or had been discharged. Initially, all active cases were assessed regardless of illness duration, but to ensure consistency and limit mean illness duration to under three years, a revised protocol was adopted: records were reviewed only after one year from illness onset (or service entry if onset was unavailable), with data collection capped at two years post-onset or service entry. Patients still in the initial three-month suitability assessment were excluded.

At study onset, the LESS sample comprised $N = 949$ FEP patients, representing all individuals seen by the service between 2009 and 2024 who had experienced at least one positive psychotic symptom. Of the total FEP sample, 740 reported experiencing AVH.

2.2. Participants

The AVH patient sample ($N = 740$) ranged in age from 13.4 to 37.5 years ($M = 25.2$, $SD = 5.2$), with 251 (33.9%) identifying as female. The most common ethnic group was Asian ($N = 233$, 31.5%), and the most frequently reported religious affiliation was Christian ($N = 189$, 25.5%).

Schizophrenia spectrum disorders were the most common diagnoses ($N = 402$, 54.9%). Age at onset, defined as the age at which the first psychotic symptom was reported, ranged from 11.4 to 35.3 years ($M = 23.2$, $SD = 5.2$). DUP ranged from 0 to 24.2 months ($M = 1.4$, $SD = 2.9$). PIL ranged from 3.7 to 81.7 months ($M = 23.4$, $SD = 10.0$). All demographic and clinical characteristics are presented in Tables 1 and 2.

2.3. Procedure

Five assistant psychologists systematically reviewed patients' electronic health records and extracted available information on the phenomenology of AVH using the LESS form (see Supplementary Material Table S1). All raters received specialized training from a senior clinical psychologist (DR) on both the phenomenology of AVH and the use of the LESS form for structured data collection.

Data extracted with the LESS forms were coded using a predefined coding framework covering CAVH characteristics, topography, content, and beliefs (described below). To assess feasibility and reliability, 10 anonymized cases were randomly selected and double-coded before coding the full dataset. Weekly consensus meetings ensured resolution of uncertainties and consistency in coding.

2.4. Measures

2.4.1. Coding framework

The structured coding framework for CAVH characteristics was developed for this study from a targeted literature review aimed at identifying common features described in the theoretical literature. Searches of Medline and PsycINFO (1990–2025) using combinations of keywords such as AVH, CAVH, psychosis, FEP, early course, and phenomenology yielded 18,366 articles; following screening for studies examining CAVH or AVH in relation to compliance and risk, 18 full-texts were deemed directly relevant.

From these studies, several voice-related and command-related characteristics associated with compliance or risk of harm were identified, including voice gender, familiarity, and perceived omnipotence (e.g. Birchwood et al., 2000; Junginger, 1990; Shawyer et al., 2008). Each characteristic included into the coding framework was supported by at least one empirical study demonstrating clinical relevance. The final set of CAVH characteristics and their operational definitions are presented in Table S2 (Supplementary Material).

Each participant's AVH experiences were manually coded in Excel on a binary scale (0 = absent/insufficient evidence, 1 = present/sufficient

Table 1Categorical patient characteristics by CAVH status with univariable logistic regression estimates in the total sample of FEP patients with AVH ($N = 740$).

	Total sample	AVH + CH	AVH - CH	Regression estimates			
	<i>N (%)</i>	<i>N (%)</i>	<i>N (%)</i>	OR	95% CIs	<i>P</i>	<i>P(FDR)</i>
Total	740 (100)	380 (51.4)	360 (48.6)				
Gender							
Male	489 (66.1)	254 (66.8)	235 (65.3)	(Ref)			
Female	251 (33.9)	126 (33.2)	125 (34.7)	0.93	0.69, 1.27	0.653	0.653
Ethnic group							
Asian	233 (31.5)	113 (29.7)	120 (33.3)	(Ref)			
Black	188 (25.4)	92 (24.2)	96 (26.7)	1.02	0.69, 1.50	0.929	0.929
Mixed	59 (8.0)	33 (8.7)	26 (7.2)	1.35	0.76, 2.41	0.309	0.689
White	173 (23.4)	91 (23.9)	82 (22.8)	1.18	0.80, 1.75	0.414	0.689
Other	87 (11.8)	51 (13.4)	36 (10.0)	1.50	0.92, 2.49	0.108	0.540
Religious group							
Christian	189 (25.5)	101 (26.6)	88 (24.4)	(Ref)			
Muslim	178 (24.1)	95 (25.0)	83 (23.1)	1.00	0.66, 1.50	0.990	0.990
Other religion	105 (14.2)	51 (13.4)	54 (15.0)	0.82	0.51, 1.33	0.424	0.706
No religion	81 (11.0)	43 (11.3)	38 (10.6)	0.99	0.59, 1.67	0.958	0.990
Not reported	187 (25.3)	90 (23.7)	97 (26.9)	0.81	0.54, 1.21	0.303	0.706
Diagnosis							
Schizophrenia spectrum	402 (54.9)	215 (56.6)	191 (53.1)	(Ref)			
Acute/secondary psychosis	204 (27.6)	96 (25.3)	108 (30)	0.79	0.56, 1.11	0.170	0.170
Affective psychosis	99 (13.8)	55 (14.5)	44 (12.2)	1.11	0.71, 1.73	0.642	0.642
Other/Not reported	31 (4.2)	14 (3.7)	17 (4.7)	0.73	0.35, 1.52	0.404	0.404

Notes. There are no missing cases in any of the reported variables.

AVH + CH indicates participants with AVH who reported command hallucinations, and AVH - CH indicates participants with AVH without command hallucinations. Values are presented as absolute values and percentages within each group.

Odds ratios (OR) with 95% confidence intervals (CIs) are derived from univariate logistic regression models with CAVH as the outcome variable. *P* represents the unadjusted *p* value, and *P* (FDR) represents the *p* value adjusted for multiple comparisons using the Benjamini–Hochberg false discovery rate procedure.

Table 2Continuous patient characteristics by CAVH status with univariate logistic regression estimates in the total sample of FEP patients with AVH ($N = 740$).

	Total sample	AVH + CH	AVH - CH	Regression estimates			
	<i>M(SD)</i>	<i>M(SD)</i>	<i>M(SD)</i>	OR	95% CIs	<i>P</i>	<i>P(FDR)</i>
Age at onset (scaled) ^a	23.24 (5.22)	23.1 (5.3)	23.4 (5.2)	0.94	0.81, 1.10	0.436*	0.436***
Age at LESS assessment (scaled)	25.18 (5.19)	25.0 (5.2)	25.3 (5.2)	0.94	0.81, 1.08	0.389**	0.462
DUP (scaled) ^b	1.43 (2.88)	1.7 (3.3)	1.2 (2.3)	1.22	1.03, 1.47	0.027*	0.055
PIL (scaled) ^c	23.38 (9.95)	24.5 (10.5)	22.2 (9.1)	1.28	1.09, 1.51	0.003**	0.006**

Abbreviations: DUP = Duration of untreated psychosis; PIL = Psychosis illness length; LESS = Lived Experience Symptom Survey.

Missing cases: Age at Onset ($N = 83$, 11.2%), DUP ($N = 122$, 16.5%), PIL ($N = 83$, 11.2%).

AVH + CH indicates participants with AVH who reported command hallucinations, and AVH - CH indicates participants with AVH without command hallucinations. Values are presented as mean (*M*) values and standard deviation (*SD*) within each group.

Odds ratios (OR) with 95% confidence intervals (CIs) are derived from univariate logistic regression models with CAVH as the outcome variable. *P* represents the unadjusted *p* value, and *P* (FDR) represents the *p* value adjusted for multiple comparisons using the Benjamini–Hochberg false discovery rate procedure. Continuous explanatory variables were standardized as *z*-scores ($z = [x - \mu] / \sigma$).

^a Age at onset defined as the age at which the first psychotic symptom was reported ($N = 657$; 88.8%).

^b DUP calculated as time between symptom onset and first prescription of antipsychotic medication ($N = 618$; 83.5%).

^c PIL defined as the time from psychosis onset to either the date of data collection or discharge, whichever occurred first ($N = 657$; 88.8%).

*** $p < .001$.

** $p < .01$.

* $p < .05$.

evidence) for each characteristic.

2.4.2. Demographic and clinical variables

Demographic (age at data collection, sex, ethnicity, religion) and clinical variables (diagnosis, age at onset, age at time of LESS assessment period end, DUP, PIL) were extracted from medical records. DUP was defined as the interval between symptom onset and first antipsychotic prescription, and PIL as the time from episode onset to either data collection or discharge, whichever occurred first. Table S3 (Supplementary Material) presents the operational definitions of demographic and clinical characteristics.

2.5. Data analyses

Absolute and relative frequencies were calculated to estimate the

prevalence and phenomenological characteristics of CAVH and compliance. Prevalence was operationalized in accordance with the National Institute of Mental Health definition, whereby “prevalence is the proportion of a population who have a specific characteristic in a given time period” (Tenny and Hoffman, 2025). Given that patients could hear more than one CAVH, and that each CAVH could issue multiple types of commands, phenomenological characteristics were coded as present if they appeared in any of a patient's CAVH experiences. For example, a patient could hear CAVH issuing both innocuous and life-threatening commands directed toward themselves or others, either within the same voice or across different voices.

Univariate logistic regression analyses included age at data collection, age at onset, DUP, and PIL as continuous explanatory variables, and sex, ethnicity, religion, and diagnosis as categorical explanatory variables, with CAVH and compliance analyzed separately as outcome

variables. Compliance was also analyzed in relation to phenomenological explanatory variables, dummy coded as present versus absent. Continuous explanatory variables were standardized (z-scores; $z = (x - \mu) / \sigma$), and categorical explanatory variables (e.g., sex, ethnicity) used the most frequent category as reference. Results are presented as odds ratios (ORs) with corresponding 95% confidence intervals (CIs), along with unadjusted *p* values and Benjamini Hochberg false discovery rate adjusted *p* values to account for multiple comparisons.

Two multivariate logistic regression models were conducted adjusting for age at data collection (LESS assessment), DUP, and PIL as continuous explanatory variables, and diagnosis as a categorical explanatory variable. CAVH and compliance were analyzed as outcomes in the respective models. To avoid multicollinearity with ‘age at onset’, only ‘age at time of LESS’ was retained in the multivariate models, as it derived from documented assessment dates and is therefore less susceptible to recall bias or variability in reporting. Multivariate model fit was evaluated using McFadden’s pseudo- R^2 . Model discrimination was assessed using the area under the receiver operating characteristic curve (AUC), and model specification was evaluated using a link test of the linear predictor.

All analyses were conducted using R version 4.4.3 (R Core Team, 2025).

3. Results

3.1. Patients with CAVH

Of the total sample (*N* = 740), 380 patients (51.4%) reported experiencing CAVH. Among these patients, 126 (33.2%) were female. The mean age at the time of assessment was 25.0 years (*SD* = 5.2, range = 13.8–36.1) and 23.1 years (*SD* = 5.3, range = 11.4–34.9) at psychosis onset. The largest ethnic group were Asian (*N* = 113, 29.7%). The most common religious affiliation was Christian (*N* = 101, 26.6%), followed by Muslim (*N* = 95, 25.0%). Schizophrenia spectrum disorders were the most frequent diagnoses (*N* = 215, 56.6%).

3.2. Demographic and clinical explanatory variables of CAVH

Categorical demographic and clinical characteristics by CAVH status, along with corresponding univariable logistic regression estimates, are presented in Table 1. No categorical variable was significantly associated with CAVH (all *p fdr* > .05).

Continuous clinical characteristics by CAVH status, with corresponding univariate logistic regression estimates, are presented in Table 2. Longer PIL (*OR* = 1.28, 95% *CI* [1.09–1.51], *p fdr* = .006) was associated with increased odds of CAVH. No other variable was significantly associated with CAVH (*p fdr* > .05).

In the multivariable regression (Table 3), longer PIL remained significantly associated with higher odds of CAVH after adjustment for other clinical variables (*OR* = 1.29, 95% *CI* [1.08–1.56], *p* = .033). All other variables were not significant (*p* > .05).

3.3. Phenomenological characteristics of CAVH

Among patient reports of CAVH (*N* = 380), human voices were most common (*N* = 189, 49.7%) and most often male (*N* = 154, 40.5%). Familiar (*N* = 80, 21.1%) and unfamiliar (*N* = 80, 21.1%) voices were equally frequent, though a large number of voice identity, gender, and familiarity reports were ‘Unspecified’.

The locus of command was most often self-directed (*N* = 343, 90.3%), followed by commands toward others (*N* = 103, 27.1%) and family members (*N* = 48, 12.6%). Bodily commands were the most prevalent domain (*N* = 332, 87.4%). Most patients reported harmful or life-threatening commands (*N* = 285, 75.0%), with half reporting both life-threatening commands (*N* = 192, 50.5%), and harmful but non-life-threatening commands (*N* = 195, 51.3%). Harmful or life-threatening

Table 3
Multivariate logistic regression estimates for CAVH adjusting for clinical patient characteristics in the total sample of FEP patients with AVH (*N* = 740).

	Regression estimates		
	OR	95% CIs	<i>p</i>
Diagnosis			
Schizophrenia spectrum	(Ref)		
Acute/secondary psychosis	0.75	0.51, 1.1	0.137*
Affective psychosis	1.27	0.78, 2.05	0.339**
Other/Not reported	0.64	0.28, 1.48	0.302***
Age at LESS Assessment (scaled)	0.97	0.82, 1.13	0.664
DUP (scaled)	1.18	0.99, 1.42	0.071
PIL (scaled)	1.21	1.02, 1.44	0.033*

Notes. Odds ratios (OR) derived from multivariable logistic regression with CAVH as the outcome.

Continuous explanatory variables were standardized as z-scores ($z = [x - \mu] / \sigma$). Reference category for diagnosis: schizophrenia spectrum. Model fit: McFadden pseudo- R^2 = 0.019. Link test for model specification (squared predicted term): *p* = .482. Area under the ROC curve (AUC) and was 0.590 (95% *CI* 0.545 to 0.635).

*** *p* < .001.

** *p* < .01.

* *p* < .05.

commands most commonly involved bodily harm (*N* = 275, 96.5%), directed toward the self (*N* = 243, 85.3%), followed by harm directed toward others (*N* = 132, 46.3%). Malevolent beliefs about voices were most frequently endorsed (*N* = 31, 8.2%), although overall endorsement of belief-related characteristics was low.

The ‘Total’ column in Table 4 presents frequencies and prevalence rates of reported phenomenological characteristics. Percentages may exceed 100% because patients could endorse multiple characteristics.

3.4. Phenomenological features of compliance

Out of the total FEP sample, 16.5% (*N* = 122) complied with commanding voices, representing 32.1% of patients who experienced CAVH. Several phenomenological features were significantly associated with compliance when compared with individuals without the respective feature (see Table 4).

Voices attributed to supernatural agents (*OR* = 2.66, 95% *CI* [1.48, 4.79], *p fdr* = 0.007) and those attributed to unfamiliar voices were associated with increased odds of compliance (*OR* = 1.90, 95% *CI* [1.14, 3.16], *p fdr* = 0.032). Voices attributed to the self (*OR* = 4.33, 95% *CI* [1.67, 14.77], *p* = .024), family members (*OR* = 3.92, 95% *CI* [2.11, 7.44], *p fdr* < 0.001), healthcare staff (*OR* = 4.03, 95% *CI* [1.36, 13.37], *p fdr* = 0.032), and objects (*OR* = 5.36, 95% *CI* [2.56, 12.43], *p fdr* < 0.001) were significantly associated with compliance. Commands in the bodily (*OR* = 3.10, 95% *CI* [1.43, 7.76], *p fdr* = 0.025), social (*OR* = 2.47, 95% *CI* [1.52, 4.01], *p fdr* = 0.002), and psychological domain (*OR* = 2.36, 95% *CI* [1.25, 4.47], *p fdr* = 0.025) were associated with greater odds of compliance. Both malevolent (*OR* = 2.82, 95% *CI* [1.34, 6.02], *p fdr* = 0.024) and benevolent (*OR* = 4.03, 95% *CI* [1.36, 13.37], *p fdr* = 0.032) voices were associated with increased compliance, although the low number of benevolent voices led to wide confidence intervals and low confidence in this finding.

Compliance was associated with commands rated as both harmful and life-threatening (*OR* = 3.28, 95% *CI* [2.04, 5.28], *p fdr* < 0.001) and harmful but not life-threatening (*OR* = 2.93, 95% *CI* [1.87, 4.65], *p fdr* < 0.001). Life-threatening or harmful commands were also likely to be complied with (*OR* = 2.09, 95% *CI* [1.23, 3.70], *p fdr* = 0.025), particularly when the voices involved social harm (*OR* = 2.50, 95% *CI* [1.32, 4.79], *p fdr* = 0.025).

Table 4

Prevalence and logistic univariate regression estimates for phenomenological predictors of compliance in FEP patients with CAVH (N = 380).

Predictors	Level	Total ^a	+ Complied N (%)	- Complied N (%)	OR	95% CIs	P	P(FDR)
CAVH		380 (100)	122 (32.1)	258 (67.9)				
Voice Identity								
Human	No	191 (50.3)	54 (28.3)	137 (71.7)	Ref	–	–	–
	Yes	189 (49.7)	68 (36.0)	121 (64.0)	1.43	0.93, 2.19	0.108	0.186
Non-human	No	370 (97.4)	119 (32.2)	251 (67.8)	Ref	–	–	–
	Yes	10 (2.6)	3 (30)	7 (70)	0.90	0.19, 3.31	0.885*	0.928
Supernatural	No	326 (85.8)	94 (28.8)	232 (71.2)	Ref	–	–	–
	Yes	54 (14.2)	28 (51.9)	26 (48.1)	2.66	1.48, 4.79	0.001**	0.007**
Unspecified	No	193 (50.8)	69 (35.8)	124 (64.2)	Ref	–	–	–
	Yes	187 (49.2)	53 (28.3)	134 (71.7)	0.71	0.46, 1.09	0.123**	0.203
Voice Familiarity								
Familiar	No	300 (78.9)	93 (31.0)	207 (69)	Ref	–	–	–
	Yes	80 (21.1)	29 (36.2)	51 (63.7)	1.27	0.75, 2.11	0.372***	0.500
Unfamiliar	No	300 (78.9)	87 (29.0)	213 (71.0)	Ref	–	–	–
	Yes	80 (21.1)	35 (43.8)	45 (56.2)	1.90	1.14, 3.16	0.013*	0.032*
Unspecified	No	110 (28.9)	37 (33.6)	73 (66.4)	Ref	–	–	–
	Yes	270 (71.1)	85 (31.5)	185 (68.5)	0.91	0.57, 1.46	0.683	0.798
Voice Gender								
Male	No	226 (59.5)	65 (28.8)	161 (71.2)	Ref	–	–	–
	Yes	154 (40.5)	57 (37.0)	97 (63.0)	1.46	0.94, 2.25	0.091	0.171
Female	No	273 (71.8)	86 (31.5)	187 (68.5)	Ref	–	–	–
	Yes	107 (28.2)	36 (33.6)	71 (66.4)	1.10	0.68, 1.77	0.687	0.798
Other/unspecified	No	150 (39.5)	47 (31.3)	103 (68.7)	Ref	–	–	–
	Yes	230 (60.5)	75 (32.6)	155 (67.4)	1.06	0.68, 1.65	0.795	0.876
Beliefs about the Voice								
Benevolence	No	366 (96.3)	113 (30.9)	253 (69.1)	Ref	–	–	–
	Yes	14 (3.7)	9 (64.3)	5 (35.7)	4.03	1.36, 13.37	0.014*	0.032*
Malevolence	No	349 (91.8)	105 (30.1)	244 (69.9)	Ref	–	–	–
	Yes	31 (8.2)	17 (54.8)	14 (45.2)	2.82	1.34, 6.02	0.006**	0.024*
Omnipotence	No	365 (96.1)	115 (31.5)	250 (68.5)	Ref	–	–	–
	Yes	15 (3.9)	7 (46.7)	8 (53.3)	1.90	0.65, 5.42	0.225	0.333
Locus of the Voice								
Self	No	37 (9.7)	4 (10.8)	33 (89.2)	Ref	–	–	–
	Yes	343 (90.3)	118 (34.4)	225 (65.6)	4.33	1.67, 14.77	0.007**	0.024*
Family	No	332 (87.4)	93 (28)	239 (72)	Ref	–	–	–
	Yes	48 (12.6)	29 (60.4)	19 (39.6)	3.92	2.11, 7.44	<0.001***	<0.001***
Friends	No	369 (97.1)	117 (31.7)	252 (68.3)	Ref	–	–	–
	Yes	11 (2.9)	5 (45.5)	6 (54.5)	1.79	0.51, 6.08	0.342	0.475
Romantic relationship	No	371 (97.6)	118 (31.8)	253 (68.2)	Ref	–	–	–
	Yes	9 (2.4)	4 (44.4)	5 (55.6)	1.72	0.42, 6.59	0.428	0.557
Colleagues	No	377 (99.2)	119 (31.6)	258 (68.4)	–	–	–	–
	Yes	3 (0.8)	3 (100)	0 (0)	–	–	–	–
Healthcare staff	No	366 (96.3)	113 (30.9)	253 (69.1)	–	–	–	–
	Yes	14 (3.7)	9 (64.3)	5 (35.7)	4.03	1.36, 13.37	0.014*	0.032*
Stranger	No	373 (98.2)	118 (31.6)	255 (68.4)	Ref	–	–	–
	Yes	7 (1.8)	4 (57.1)	3 (42.9)	2.88	0.63, 14.82	0.170	0.262
Objects	No	348 (91.6)	100 (28.7)	248 (71.3)	Ref	–	–	–
	Yes	32 (8.4)	22 (68.8)	10 (31.2)	5.46	2.56, 12.43	<0.001***	<0.001***
Others	No	277 (72.9)	82 (29.6)	195 (70.4)	Ref	–	–	–
	Yes	103 (27.1)	40 (38.8)	63 (61.2)	1.51	0.94, 2.42	0.088	0.171
Unspecified	No	356 (93.7)	116 (32.6)	240 (67.4)	Ref	–	–	–
	Yes	24 (6.3)	6 (25)	18 (75)	0.69	0.24, 1.69	0.443	0.561
Command Domain								
Bodily	No	48 (12.6)	7 (14.6)	41 (85.4)	Ref	–	–	–
	Yes	332 (87.4)	115 (34.6)	217 (65.4)	3.10	1.43, 7.76	0.008**	0.025*
Social	No	288 (75.8)	78 (27.1)	210 (72.9)	Ref	–	–	–
	Yes	92 (24.2)	44 (47.8)	48 (52.2)	2.47	1.52, 4.01	<0.001***	0.002**
Psychological	No	336 (88.4)	100 (29.8)	236 (70.2)	Ref	–	–	–
	Yes	44 (11.6)	22 (50)	22 (50)	2.36	1.25, 4.47	0.008**	0.025*
Unclassifiable	No	322 (84.7)	102 (31.7)	220 (68.3)	Ref	–	–	–
	Yes	58 (15.3)	20 (34.5)	38 (65.5)	1.14	0.62, 2.03	0.674	0.798
Command Severity								
Positive	No	325 (85.5)	99 (30.5)	226 (69.5)	Ref	–	–	–
	Yes	55 (14.5)	23 (41.8)	32 (58.2)	1.64	0.91, 2.94	0.097	0.175

(continued on next page)

Table 4 (continued)

Predictors	Level	Total ^a	+ Complied N (%)	- Complied N (%)	OR	95% CIs	P	P(FDR)
Innocuous	No	237 (62.4)	67 (28.3)	170 (71.7)	Ref	–	–	–
	Yes	143 (37.6)	55 (38.5)	88 (61.5)	1.59	1.02, 2.46	0.040*	0.083
Unspecified	No	334 (87.9)	107 (32)	227 (68)	Ref	–	–	–
	Yes	46 (12.1)	15 (32.6)	31 (67.4)	1.03	0.52, 1.95	0.938	0.960
Life-threatening	No	188 (49.5)	51 (27.1)	137 (72.9)	Ref	–	–	–
	Yes	192 (50.5)	71 (37)	121 (63)	1.58	1.02, 2.44	0.040*	0.083
Harmful but not life-threatening	No	185 (48.7)	38 (20.5)	147 (79.5)	Ref	–	–	–
	Yes	195 (51.3)	84 (43.1)	111 (56.9)	2.93	1.87, 4.65	<0.001***	<0.001***
Both harmful and life-threatening	No	278 (73.2)	69 (24.8)	209 (75.2)	Ref	–	–	–
	Yes	102 (26.8)	53 (52)	49 (48)	3.28	2.04, 5.28	<0.001***	<0.001***
Either harmful or life-threatening	No	95 (25.0)	20 (21.1)	75 (78.9)	Ref	–	–	–
	Yes	285 (75.0)	102 (35.8)	183 (64.2)	2.09	1.23, 3.70	0.009**	0.025*
Out of those with either life-threatening or harmful commands (N = 285) ^b								
Harm Domain								
Bodily	No	10 (3.5)	2 (20)	8 (80)	Ref	–	–	–
	Yes	275 (96.5)	100 (36.4)	175 (63.6)	–	–	–	–
Social	No	239 (83.9)	77 (32.2)	162 (67.8)	Ref	–	–	–
	Yes	46 (16.1)	25 (54.3)	21 (45.7)	2.50	1.32, 4.79	0.005**	0.025*
Psychological	No	262 (91.9)	89 (34)	173 (66)	Ref	–	–	–
	Yes	23 (8.1)	13 (56.5)	10 (43.5)	2.53	1.07, 6.14	0.035*	0.088
Unclassifiable	No	278 (97.5)	100 (36)	178 (64)	–	–	–	–
	Yes	7 (2.5)	2 (28.6)	5 (71.4)	–	–	–	–
Harm Type		10 (3.5)						
Harm to self	No	42 (14.7)	8 (19)	34 (81)	Ref	–	–	–
	Yes	243 (85.3)	94 (38.7)	149 (61.3)	2.68	1.25, 6.45	0.017*	0.052
Harm to others	No	153 (53.7)	47 (30.7)	106 (69.3)	Ref	–	–	–
	Yes	132 (46.3)	55 (41.7)	77 (58.3)	1.61	0.99, 2.63	0.055	0.118
Harm from others	No	280 (98.2)	100 (35.7)	180 (64.3)	–	–	–	–
	Yes	5 (1.8)	2 (40)	3 (60)	–	–	–	–
Accident	No	283 (99.3)	101 (35.7)	182 (64.3)	–	–	–	–
	Yes	2 (0.7)	1 (50)	1 (50)	–	–	–	–
Neglect	No	271 (95.1)	95 (35.1)	176 (64.9)	–	–	–	–
	Yes	14 (4.9)	7 (50)	7 (50)	1.85	0.62, 5.56	0.262	0.393

Abbreviations: Ref = Reference group.

Phenomenological variable levels with fewer than three cases (e.g., Colleagues, Neglect) were excluded from the analysis due to insufficient cases for meaningful comparisons.

Odds ratios (OR) with 95% confidence intervals (CIs) are derived from univariate logistic regression models with compliance as the outcome variable. P represents the unadjusted *p* value, and P (FDR) represents the *p* value adjusted for multiple comparisons using the Benjamini–Hochberg false discovery rate procedure.

^a Total refers to the number of patients who did (Level = Yes) or did not (Level = No) report each phenomenological variable in their medical records.

^b Harm domain and type were analyzed only among participants with life-threatening or harmful commands (N = 285), since these categories were only reported/relevant for that subgroup.

*** *p* < .001.

** *p* < .01.

* *p* < .05.

3.5. Demographic and clinical explanatory variables of compliance

In contrast to phenomenological characteristics, no demographic and clinical explanatory variables, including age, sex, ethnicity, DUP, age at onset, and diagnosis, were significantly associated with compliance (*p* *fdr* > 0.05; see Table S4 and S5 in the Supplementary Material). Similarly, in the multivariable regression analysis, none of these explanatory variables was significantly associated with higher odds of compliance after adjustment for other clinical variables (*p* > .05; See Table S6).

4. Discussion

This quality improvement study examined the prevalence, phenomenology, demographic and clinical factors associated with CAVH and compliance in individuals with FEP at first service contact. By addressing these domains, the study advances understanding of previously underexplored aspects of CAVH in FEP within EIPS. The findings contribute to clinical guidance for early detection, targeted assessment, and risk evaluation, while also informing the development of personalized intervention strategies and staff training.

4.1. Prevalence of CAVH

Half of patients with AVH reported experiencing CAVH, indicating that CAVH are a prominent and clinically significant feature of FEP. Their prevalence in individuals in FEP was approximately twice that reported in previous studies (Rajapakse et al., 2011; Upthegrove et al., 2016), reflecting both the methodological advantages of the large patient sample of the present phenomenological analyses and the variability arising from differing operational definitions (Upthegrove et al., 2016). This discrepancy highlights the need for greater conceptual and operational clarity in defining CAVH, as variations in inclusion criteria can influence prevalence estimates and their clinical interpretation. The prevalence rate observed in this study is consistent with estimates reported in broader psychiatric populations (e.g., Birchwood et al., 2014) and emphasizes that CAVH are already common at illness onset, warranting recognition as a distinct clinical phenomenon rather than a peripheral subtype of voice-hearing.

4.2. Clinical and demographic factors of CAVH

Longer illness duration was associated with increased likelihood of CAVH, possibly reflecting an evolution of AVH into more coercive forms

over time (McCarthy-Jones et al., 2014). Prolonged illness may perpetuate distress and social adversity, contributing to more intrusive voice content (Varese et al., 2016). As psychosis becomes more chronic, CAVH may become increasingly elaborate and distressing (Barnes et al., 2008; Marshall et al., 2005), underscoring the importance of early and targeted intervention to mitigate the impact of high-risk voice phenomena before prolonged illness duration entrenches adverse outcomes. PIL remained significant in the multivariate model. This may reflect the greater time window for CAVH to emerge and consolidate with longer illness duration (Nayani and David, 1996), which also encompasses the untreated period.

Interestingly, no other demographic or clinical explanatory variables such as age, sex, diagnosis or religion were associated with the presence of CAVH, despite their established associations with AVH more broadly (Iyassu et al., 2014; Qi et al., 2020; Sartorius et al., 1986; Stompe et al., 2006; Suhail and Ghauri, 2010), suggesting that CAVH may be shaped by distinct mechanisms and warranting its consideration as a standalone clinical phenomenon. Although nearly one-third of FEP patients experiencing CAVH reported compliance, consistent with prior research (Rajapakse et al., 2011; Upthegrove et al., 2016), neither demographic nor clinical variables were significantly associated with compliance, reinforcing the view that traditional risk markers have limited explanatory power for this phenomenon. Instead, phenomenological characteristics of voices emerged as the strongest explanatory variables, underscoring their central role in understanding these experiences. This finding aligns with theoretical models that foreground cognitive and relational appraisals of voices (Barrowcliff and Haddock, 2006; Birchwood et al., 2000; Braham et al., 2004; Chadwick and Birchwood, 1994; Hayward, 2003; Hayward et al., 2011), as well as research highlighting the importance of voice content (Alderson-Day et al., 2021; Larøi et al., 2019; Nayani and David, 1996; Shiel et al., 2022), suggesting that the nuanced experiential qualities of voices are not only theoretically significant but also clinically crucial for effective risk evaluation and intervention.

4.3. Phenomenology of CAVH and compliance

Human identity was frequently attributed to commanding voices, although voice identity, familiarity and gender were often ‘Unspecified’. When gender was specified, male voices predominated, consistent with evidence that male voices are more often perceived as authoritative and dominant (Klofstad et al., 2012; Puts et al., 2007). However, our findings did not support prior accounts suggesting that male gender increases the likelihood of compliance (Barrowcliff and Haddock, 2006, 2006; Paulik, 2012).

Commands most often targeted the self, followed by others and family members. Although self-directed commands were the most common and most frequently enacted, compliance was also more likely when commands targeted other relationally proximal recipients, such as family members or healthcare staff, although the latter occurred in a smaller number of cases. This pattern aligns with relational theories of psychosis, which propose that positive symptoms often entail interpersonal dynamics, with hallucinations and delusions relating to significant social relationships (Read et al., 2008, 2005; Salvatore et al., 2018, 2012). Within this framework, relational processes may also mediate compliance with content-specific commands (Fox et al., 2004). Importantly, compliance with commands from socially proximal individuals may introduce additional interpersonal conflict and heightened moral distress in voice-hearers (Corstens et al., 2012).

Compliance was significantly associated with supernatural or unfamiliar voices, demonstrating that risk extends beyond identifiable relational voices to “alien” voices situated within broader belief systems. Such compliance may be explained by socio-cognitive models that associate unfamiliarity with heightened perceptions of authority and threat (Guthrie, 1993; Hayward, 2003; Maji et al., 2019). Taken together, these findings suggest that compliance may arise through

different pathways, including threat-based appraisals of unfamiliar voices and trust-based appraisals associated with relationally proximal voices (Birchwood et al., 2000; Hersh and Borum, 1998; Shawyer et al., 2003).

Although compliance was associated with commands across physical, social, and psychological domains, harm-related commands most commonly involved harm within the social sphere and were more likely to be enacted, consistent with previous research (Beck-Sander et al., 1997; McCarthy-Jones et al., 2014), which often associates such commands with severe consequences (Hazell et al., 2024). Therefore, risk assessments must evaluate not only the presence of CAVH but also their content, target, and relational context.

Malevolent voices were associated with an increased risk of compliance, suggesting that negatively valenced voices may be particularly compelling, consistent with evidence that they elicit greater emotional distress (Andrew et al., 2008; Beck-Sander et al., 1997; Chadwick and Birchwood, 1994; Peters et al., 2012). Benevolent voices were also statistically associated with compliance, consistent with prior evidence linking them to more severe positive symptoms and greater certainty of future compliance (Dugré and West, 2019). Omnipotence, frequently implicated in models of compliance with AVH (Birchwood et al., 2000; Braham et al., 2004; Hayward et al., 2014), did not emerge as a significant correlate of compliance. However, the low overall endorsement of belief-related phenomenological characteristics (benevolence, malevolence, and omnipotence) and the wide confidence intervals in the regression estimates likely reflect a limitation stemming from the lack of comprehensive assessment using a structured measurement tool. This warrants further investigation, ideally using formal measures of these constructs.

Collectively, these findings emphasize the central role of phenomenological features such as perceived identity and relational context, in shaping compliance (Birchwood et al., 2000; De Boer et al., 2016). These findings align with relational and social rank models (Birchwood et al., 2000; Hayward, 2003), which posit that compliance is driven less by valence alone than by perceived social power, authority, and the individual's relationship to the voice.

4.4. Clinical implications

CAVH were reported by over half of patients, underscoring the need for systematic screening from the earliest stages of psychosis in EIPS. Training clinical staff on the features of CAVH most associated with compliance may enhance empathy and competence when engaging patients with diverse clinical and cultural backgrounds. Beyond presence alone, assessments should capture the content, perceived source, and relational qualities of voices, as compliance appears driven more by these factors than by the occurrence of commands alone. Such information may help clinicians identify patients at heightened risk of complying with harmful commands.

Therapeutic approaches that address the relational properties of voices, such as Avatar therapy (Beaudoin et al., 2021; Craig et al., 2018; Leff et al., 2014) and relational interventions (Hayward et al., 2017, 2011), show promise in reducing distress by targeting voice identity and power dynamics (Deamer and Wilkinson, 2015). The present findings strengthen the evidence base for these therapeutic frameworks, indicating that targeting the credibility and phenomenological components of harmful voices while fostering adaptive coping may help mitigate risk.

For EIPS, embedding structured assessments of voice characteristics and appraisals into routine practice could improve risk formulation. Clinicians should be supported to move beyond symptom checklists to explore the personal meaning of voices. Tailored cognitive-behavioral and family interventions may reduce compliance risk, especially given that one in eight commands targeted relatives. Incorporating these findings into psychoeducation could also normalize experiences and promote recovery by addressing both the phenomenological and emotional

dimensions of CAVH.

Integrating these approaches into EIPS care pathways could enhance risk management and promote recovery by addressing both the phenomenological qualities of voices and the emotional significance attributed to them.

4.5. Strengths and limitations

Key strengths of this study include its focus on an underexplored subgroup, individuals experiencing CAVH during early-course psychosis, its cultural diversity, and the use of routinely collected clinical data, which enhances ecological and clinical validity as well as real-world relevance. The study benefits from a large clinical sample ($N = 740$), providing a level of comprehensiveness and data completeness that exceeds most previous investigations in the field of early psychosis. Extracting medical record data across the early course of the psychosis trajectory provided substantially greater data completeness than would be achievable through a single interview-based approach, which may be limited by patient insight and rapport. Finally, the analysis of verbatim medical records allowed for a nuanced, in-depth examination of the phenomenology of CAVH, capturing clinical detail that might otherwise be lost in structured assessments.

This study relied on retrospective clinical records, which may be subject to incomplete or inconsistent documentation. Although this approach enabled inclusion of a large sample, psychiatric records require ongoing improvement (Instefjord et al., 2014), and the quality and depth of recorded information depend on clinical priorities and service structures (Gilbert et al., 1996; Hart and Yoost, 2025). Despite relatively high diagnostic accuracy in psychotic disorders (Davis et al., 2016), clinicians may prioritize harmful commands (e.g., self-injury) and associated compliance behaviours over less clinically salient content (e.g., innocuous commands). This represents a limitation, as differential recording may underrepresent the full phenomenological range of CAVH and potentially inflate observed compliance rates for risk-related phenomenological variables.

Moreover, although the large sample size represents a strength, it prohibited dual coding of all cases. Instead, a subset of records was cross-rated by multiple raters to ensure adherence to the coding framework. However, the absence of formal inter-rater reliability metrics represents a limitation, as agreement between raters was not systematically quantified, leaving the reliability of item-level findings unestablished.

Additionally, complex cognitive appraisals such as perceived omnipotence, typically assessed using structured instruments (e.g., BAVQ-R; Chadwick et al., 2000), are unlikely to be systematically captured in routine records. Low endorsement of such constructs may therefore reflect limited documentation sensitivity rather than true absence. In addition, staged modifications to the inclusion criteria, driven by pragmatic service constraints, may have introduced selection bias. Future research employing structured assessments and predefined inclusion criteria is needed to examine the impact of documentation practices on CAVH and compliance, replicate the present findings, and improve generalizability.

Finally, clinically-relevant variables such as trauma history and comorbid substance use, both established risk factors for AVH, were not systematically collected and could therefore not be included as covariates in the analyses. This represents a limitation, as these factors could potentially confound the observed association between CAVH and compliance (Bailey et al., 2018; Dugré et al., 2018). Although some studies report strong links between trauma or substance use and specific hallucination content (Corstens and Longden, 2013; Daalman et al., 2012; Peach et al., 2021), findings across the literature remain variable (Barrowcliff and Haddock, 2006; Hardy et al., 2005; Mackinnon et al., 2004; McCarthy-Jones et al., 2014; Redstone, 2011). Future hypothesis-driven research should incorporate structured assessments of trauma and substance use to clarify their potential confounding effects

on the association between CAVH and compliance.

5. Conclusion

CAVH are common and clinically significant in FEP, often involving harmful compliance and posing risk of harm to self or relationally proximal others. These findings highlight the need to integrate phenomenological characteristics into routine screening, risk formulation, and early intervention, particularly for individuals with longer illness duration or delayed treatment. The combined analysis of prevalence, phenomenological characteristics, and clinical associations offer a multidimensional perspective on CAVH, advancing knowledge that can inform evidence-based assessment and management of CAVH. Replication across services will further strengthen early intervention strategies.

CRediT authorship contribution statement

Elisavet Pappa: Visualization, Validation, Software, Methodology, Writing – review & editing, Writing – original draft. **Ching So:** Methodology, Investigation, Formal analysis, Data curation, Writing – original draft. **Jennifer McGowan:** Resources, Project administration. **Gabrielle Ng:** Methodology, Investigation. **Alysia Sweeney:** Resources, Project administration. **Athina Servi:** Methodology, Investigation, Data curation. **Charmayne Tsz Wing Lau:** Investigation, Data curation. **Rozhina Modaresi:** Investigation, Data curation. **Angel Yee Fong Au:** Investigation, Data curation. **Zuri Zhang:** Investigation, Data curation. **Simran Seera:** Resources, Investigation. **Monica Huerga-Malillos:** Resources, Project administration. **Ben Gaughan:** Resources, Project administration. **Amber Gill:** Project administration, Data curation. **Emily Hickson:** Project administration, Data curation. **Anjeza Koruni:** Investigation, Data curation. **Amber Nomani:** Data curation. **Harriet Allen:** Data curation. **Hollie Edwards:** Data curation. **Jacob Barnett:** Data curation. **Faaziah Islam:** Data curation. **Jonathan Souray:** Project administration, Conceptualization. **Vaughan Bell:** Supervision, Project administration, Writing – review & editing. **David Raune:** Supervision, Resources, Project administration, Methodology, Investigation, Formal analysis, Data curation, Conceptualization, Writing – review & editing.

Ethics approval

The study was registered as an NHS Quality Improvement (QI) project titled “EIPS – Local Symptom Survey (Delusions & Hallucinations Survey)” and was conducted in accordance with NHS ethical principles.

Funding sources

The study was funded by the NoCLoR (an NHS-based Research Office serving a partnership of North London NHS Trusts, primary care organisations, social care services). NoCLoR had no role in the study design, data collection, analysis, interpretation, or manuscript preparation.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Acknowledgements

We would like to thank Aidan Flinn, Megan Bourke, Thea Gayle, Leanne Makarem, Nethmi Rajapaksa, and Yukta Jotwani for their assistance with additional data collection. We are also grateful to Kingsley Akuffo, Melisha Padayatchi, Alastair Penman, and Ryan Kemp for their directorial support, and to Krishan Sahota, Sue Barrett, and Ali Modaresi for their management support.

Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.schres.2026.09.042>.

Data availability

The anonymised data supporting the findings of this study are available upon reasonable request from the corresponding author following all relevant regulations.

References

- Alderson-Day, B., Woods, A., Moseley, P., Common, S., Deamer, F., Dodgson, G., Fernyhough, C., 2021. Voice-hearing and personification: characterizing social qualities of auditory verbal hallucinations in early psychosis. *Schizophr. Bull.* 47, 228–236. <https://doi.org/10.1093/schbul/sbaa095>.
- American Psychiatric Association (Ed.), 2013. *Diagnostic and Statistical Manual of Mental Disorders*, Fifth Edition. American Psychiatric Association. <https://doi.org/10.1176/appi.books.9780890425596>.
- Andrew, E.M., Gray, N.S., Snowden, R.J., 2008. The relationship between trauma and beliefs about hearing voices: a study of psychiatric and non-psychiatric voice hearers. *Psychol. Med.* 38, 1409–1417. <https://doi.org/10.1017/S003329170700253X>.
- Bailey, T., Alvarez-Jimenez, M., Garcia-Sanchez, A.M., Hulbert, C., Barlow, E., Bendall, S., 2018. Childhood trauma is associated with severity of hallucinations and delusions in psychotic disorders: a systematic review and meta-analysis. *Schizophr. Bull.* 44, 1111–1122. <https://doi.org/10.1093/schbul/sbx161>.
- Barnes, T.R.E., Leeson, V.C., Mutsatsa, S.H., Watt, H.C., Hutton, S.B., Joyce, E.M., 2008. Duration of untreated psychosis and social function: 1-year follow-up study of first-episode schizophrenia. *Br. J. Psychiatry* 193, 203–209. <https://doi.org/10.1192/bjp.bp.108.049718>.
- Barrowcliff, A.L., Haddock, G., 2006. The relationship between command hallucinations and factors of compliance: a critical review of the literature. *J. Forensic Psychiatry Psychol.* 17, 266–298. <https://doi.org/10.1080/14789940500485078>.
- Beaudoin, M., Potvin, S., Machalani, A., Dellazizzo, L., Bourguignon, L., Phraxayavong, K., Dumais, A., 2021. The therapeutic processes of avatar therapy: a content analysis of the dialogue between treatment-resistant patients with schizophrenia and their avatar. *Clin. Psychol. Psychother.* 28, 500–518. <https://doi.org/10.1002/cpp.2556>.
- Beck-Sander, A., Birchwood, M., Chadwick, P., 1997. Acting on command hallucinations: a cognitive approach. *Br. J. Clin. Psychol.* 36, 139–148. <https://doi.org/10.1111/j.1469-8260.1997.tb01237.x>.
- Birchwood, M., Todd, P., Jackson, C., 1998. Early intervention in psychosis: the critical period hypothesis. *Br. J. Psychiatry* 172, 53–59. <https://doi.org/10.1192/S0007125000297663>.
- Birchwood, M., Meaden, A., Trower, P., Gilbert, P., Plaistow, J., 2000. The power and omnipotence of voices: subordination and entrapment by voices and significant others. *Psychol. Med.* 30, 337–344. <https://doi.org/10.1017/S0033291799001828>.
- Birchwood, M., Michael, M., Meaden, A., Tarrier, N., Lewis, S., Wykes, T., Davies, L., Dunn, G., Peters, E., 2014. Cognitive behaviour therapy to prevent harmful compliance with command hallucinations (COMMAND): a randomised controlled trial. *Lancet Psychiatry* 1, 23–33. [https://doi.org/10.1016/S2215-0366\(14\)70247-0](https://doi.org/10.1016/S2215-0366(14)70247-0).
- Braham, L.G., Trower, P., Birchwood, M., 2004. Acting on command hallucinations and dangerous behavior: a critique of the major findings in the last decade. *Clin. Psychol. Rev.* 24, 513–528. <https://doi.org/10.1016/j.cpr.2004.04.002>.
- Chadwick, P., Birchwood, M., 1994. The omnipotence of voices: a cognitive approach to auditory hallucinations. *Br. J. Psychiatry* 164, 190–201. <https://doi.org/10.1192/bjp.164.2.190>.
- Chadwick, P., Lees, S., Birchwood, M., 2000. The revised beliefs about voices questionnaire (BAVQ-R). *Br. J. Psychiatry* 177, 229–232. <https://doi.org/10.1192/bjp.177.3.229>.
- Corstens, D., Longden, E., 2013. The origins of voices: links between life history and voice hearing in a survey of 100 cases. *Psychosis* 5, 270–285. <https://doi.org/10.1080/17522439.2013.816337>.
- Corstens, D., Longden, E., May, R., 2012. Talking with voices: exploring what is expressed by the voices people hear. *Psychosis* 4, 95–104. <https://doi.org/10.1080/17522439.2011.571705>.
- Craig, T.K., Rus-Calafell, M., Ward, T., Leff, J.P., Huckvale, M., Howarth, E., Emsley, R., Garety, P.A., 2018. AVATAR therapy for auditory verbal hallucinations in people with psychosis: a single-blind, randomised controlled trial. *Lancet Psychiatry* 5, 31–40. [https://doi.org/10.1016/S2215-0366\(17\)30427-3](https://doi.org/10.1016/S2215-0366(17)30427-3).
- Daalman, K., Diederik, K.M.J., Derks, E.M., Van Lutterveld, R., Kahn, R.S., Sommer, I.E.C., 2012. Childhood trauma and auditory verbal hallucinations. *Psychol. Med.* 42, 2475–2484. <https://doi.org/10.1017/S0033291712000761>.
- Davis, K.A.S., Sudlow, C.L.M., Hotopf, M., 2016. Can mental health diagnoses in administrative data be used for research? A systematic review of the accuracy of routinely collected diagnoses. *BMC Psychiatry* 16, 263. <https://doi.org/10.1186/s12888-016-0963-x>.
- De Boer, J.N., Heringa, S.M., Van Dellen, E., Wijnen, F.N.K., Sommer, I.E.C., 2016. A linguistic comparison between auditory verbal hallucinations in patients with a psychotic disorder and in nonpsychotic individuals: not just what the voices say, but how they say it. *Brain Lang.* 162, 10–18. <https://doi.org/10.1016/j.bandl.2016.07.011>.
- Deamer, F., Wilkinson, S., 2015. The speaker behind the voice: therapeutic practice from the perspective of pragmatic theory. *Front. Psychol.* 6. <https://doi.org/10.3389/fpsyg.2015.00817>.
- Dugré, J.R., West, M.L., 2019. Disentangling compliance with command hallucinations: heterogeneity of voice intents and their clinical correlates. *Schizophr. Res.* 212, 33–39. <https://doi.org/10.1016/j.schres.2019.08.016>.
- Dugré, J.R., Guay, J.-P., Dumais, A., 2018. Risk factors of compliance with self-harm command hallucinations in individuals with affective and non-affective psychosis. *Schizophr. Res.* 195, 115–121. <https://doi.org/10.1016/j.schres.2017.09.001>.
- Ellett, L., Luzon, O., Birchwood, M., Abbas, Z., Harris, A., Chadwick, P., 2017. Distress, omnipotence, and responsibility beliefs in command hallucinations. *Br. J. Clin. Psychol.* 56, 303–309. <https://doi.org/10.1111/bjc.12139>.
- Fox, J.R., Gray, N.S., Lewis, H., 2004. Factors determining compliance with command hallucinations with violent content: the role of social rank, perceived power of the voice and voice malevolence. *J. Forensic Psychiatry Psychol.* 15, 511–531. <https://doi.org/10.1080/1478994042000226741>.
- Gilbert, E.H., Lowenstein, S.R., Koziol-McLain, J., Barta, D.C., Steiner, J., 1996. Chart reviews in emergency medicine research: where are the methods? *Ann. Emerg. Med.* 27, 305–308. [https://doi.org/10.1016/S0196-0644\(96\)70264-0](https://doi.org/10.1016/S0196-0644(96)70264-0).
- Guthrie, S., 1993. *Faces in the Clouds: A New Theory of Religion*. Oxford University Press, New York.
- Hardy, A., Fowler, D., Freeman, D., Smith, B., Steel, C., Evans, J., Garety, P., Kuipers, E., Bebbington, P., Dunn, G., 2005. Trauma and hallucinatory experience in psychosis. *J. Nerv. Ment. Dis.* 193, 501–507. <https://doi.org/10.1097/01.nmd.0000172480.56308.21>.
- Hart, O., Yoost, J.L., 2025. Retrospective chart reviews: a practical approach to designing, collecting data, and writing the manuscript. *Marshall J. Med.* 11. <https://doi.org/10.33470/2379-9536.1468>.
- Hayward, M., 2003. Interpersonal relating and voice hearing: to what extent does relating to the voice reflect social relating? *Psychol. Psychother. Theory Res. Pract.* 76, 369–383. <https://doi.org/10.1348/147608303770584737>.
- Hayward, M., Berry, K., Ashton, A., 2011. Applying interpersonal theories to the understanding of and therapy for auditory hallucinations: a review of the literature and directions for further research. *Clin. Psychol. Rev.* 31, 1313–1323. <https://doi.org/10.1016/j.cpr.2011.09.001>.
- Hayward, M., Berry, K., McCarthy-Jones, S., Strauss, C., Thomas, N., 2014. Beyond the omnipotence of voices: further developing a relational approach to auditory hallucinations. *Psychosis* 6, 242–252. <https://doi.org/10.1080/17522439.2013.839735>.
- Hayward, M., Jones, A.-M., Bogen-Johnston, L., Thomas, N., Strauss, C., 2017. Relating therapy for distressing auditory hallucinations: a pilot randomized controlled trial. *Schizophr. Res.* 183, 137–142. <https://doi.org/10.1016/j.schres.2016.11.019>.
- Hazell, C.M., Hasapopoulos, S., McGowan, J., Hamza, R., Ahmed, Z., Gaughan, B., Malillos, M.H., Gill, A., Nomani, A., Hickson, E., Koruni, A., Islam, F., Souray, J., Raune, D., 2024. The role of verbal auditory hallucinations in influencing and retrospectively predicting physical harm prevalence in early psychosis. *Clin. Pract. Epidemiol. Ment. Health* 20, e17450179286452. <https://doi.org/10.2174/0117450179286452240520070533>.
- Hersh, K., Borum, R., 1998. Command hallucinations, compliance, and risk assessment. *J. Am. Acad. Psychiatry Law Online* 26, 353.
- Instefjord, M.H., Aasekjær, K., Espehaug, B., Graverholt, B., 2014. Assessment of quality in psychiatric nursing documentation – a clinical audit. *BMC Nurs.* 13, 32. <https://doi.org/10.1186/1472-6955-13-32>.
- Isaacson, M., Hazell, C.M., Cape, J., Hickson, E., Islam, F., Gill, A., Simon, K., Patel, R., Souray, J., Raune, D., 2022. The cognitive-phenomenological assessment of delusions and hallucinations at the early intervention in psychosis service stage: the results of a quality improvement project. *Early Interv. Psychiatry* 16, 1345–1352. <https://doi.org/10.1111/eip.13283>.
- Iyassu, R., Jolley, S., Bebbington, P., Dunn, G., Emsley, R., Freeman, D., Fowler, D., Hardy, A., Waller, H., Kuipers, E., Garety, P., 2014. Psychological characteristics of religious delusions. *Soc. Psychiatry Psychiatr. Epidemiol.* 49, 1051–1061. <https://doi.org/10.1007/s00127-013-0811-y>.
- Junginger, J., 1990. Predicting compliance with command hallucinations. *Am. J. Psychiatry* 147, 245–247. <https://doi.org/10.1176/ajp.147.2.245>.
- Klofstad, C.A., Anderson, R.C., Peters, S., 2012. Sounds like a winner: voice pitch influences perception of leadership capacity in both men and women. *Proc. R. Soc. B Biol. Sci.* 279, 2698–2704. <https://doi.org/10.1098/rspb.2012.0311>.
- Larøi, F., Thomas, N., Aleman, A., Fernyhough, C., Wilkinson, S., Deamer, F., McCarthy-Jones, S., 2019. The ice in voices: understanding negative content in auditory-verbal hallucinations. *Clin. Psychol. Rev.* 67, 1–10. <https://doi.org/10.1016/j.cpr.2018.11.001>.
- Leff, J., Williams, G., Huckvale, M., Arbutnot, M., Leff, A.P., 2014. Avatar therapy for persecutory auditory hallucinations: what is it and how does it work? *Psychosis* 6, 166–176. <https://doi.org/10.1080/17522439.2013.773457>.
- Mackinnon, A., Copolov, D.L., Trauer, T., 2004. Factors associated with compliance and resistance to command hallucinations. *J. Nerv. Ment. Dis.* 192, 357–362. <https://doi.org/10.1097/01.nmd.0000126728.70060.f0>.
- Maij, D.L.R., Van Schie, H.T., Van Elk, M., 2019. The boundary conditions of the hypersensitive agency detection device: an empirical investigation of agency detection in threatening situations. *Relig., Brain Behav.* 9, 23–51. <https://doi.org/10.1080/2153599X.2017.1362662>.
- Marshall, M., Lewis, S., Lockwood, A., Drake, R., Jones, P., Croudace, T., 2005. Association between duration of untreated psychosis and outcome in cohorts of first-

- episode patients: a systematic review. *Arch. Gen. Psychiatry* 62, 975. <https://doi.org/10.1001/archpsyc.62.9.975>.
- McCarthy-Jones, S., Trauer, T., Mackinnon, A., Sims, E., Thomas, N., Copolov, D.L., 2014. A new phenomenological survey of auditory hallucinations: evidence for subtypes and implications for theory and practice. *Schizophr. Bull.* 40, 231–235. <https://doi.org/10.1093/schbul/sbs156>.
- Mcgorry, P.D., Killackey, E., Yung, A., 2008. Early intervention in psychosis: concepts, evidence and future directions. *World Psychiatry* 7, 148–156. <https://doi.org/10.1002/j.2051-5545.2008.tb00182.x>.
- Nayani, T.H., David, A.S., 1996. The auditory hallucination: a phenomenological survey. *Psychol. Med.* 26, 177–189. <https://doi.org/10.1017/S003329170003381X>.
- Paulik, G., 2012. The role of social schema in the experience of auditory hallucinations: a systematic review and a proposal for the inclusion of social schema in a cognitive behavioural model of voice hearing. *Clin. Psychol. Psychother.* 19, 459–472. <https://doi.org/10.1002/cpp.768>.
- Peach, N., Alvarez-Jimenez, M., Cropper, S.J., Sun, P., Halpin, E., O'Connell, J., Bendall, S., 2021. Trauma and the content of hallucinations and post-traumatic intrusions in first-episode psychosis. *Psychol. Psychother.* 94, 223–241. <https://doi.org/10.1111/papt.12273>.
- Peters, E.R., Williams, S.L., Cooke, M.A., Kuipers, E., 2012. It's not what you hear, it's the way you think about it: appraisals as determinants of affect and behaviour in voice hearers. *Psychol. Med.* 42, 1507–1514. <https://doi.org/10.1017/S0033291711002650>.
- Puts, D.A., Hodges, C.R., Cárdenas, R.A., Gaulin, S.J.C., 2007. Men's voices as dominance signals: vocal fundamental and formant frequencies influence dominance attributions among men. *Evol. Hum. Behav.* 28, 340–344. <https://doi.org/10.1016/j.evolhumbehav.2007.05.002>.
- Qi, R., Palmier-Claus, J., Simpson, J., Varese, F., Bentall, R., 2020. Sexual minority status and symptoms of psychosis: the role of bullying, discrimination, social support, and drug use – findings from the Adult Psychiatric Morbidity Survey 2007. *Psychol. Psychother. Theory Res. Pract.* 93, 503–519. <https://doi.org/10.1111/papt.12242>.
- R Core Team, 2025. *R: A Language and Environment for Statistical Computing*.
- Rajapakse, T., Garcia-Rosales, A., Weerawardene, S., Cotton, S., Fraser, R., 2011. Themes of delusions and hallucinations in first-episode psychosis. *Early Interv. Psychiatry* 5, 254–258. <https://doi.org/10.1111/j.1751-7893.2011.00281.x>.
- Read, J., Van Os, J., Morrison, A.P., Ross, C.A., 2005. Childhood trauma, psychosis and schizophrenia: a literature review with theoretical and clinical implications. *Acta Psychiatr. Scand.* 112, 330–350. <https://doi.org/10.1111/j.1600-0447.2005.00634.x>.
- Read, J., Fink, P., Rudegeair, T., Felitti, V., Whitfield, C., 2008. Child maltreatment and psychosis: a return to a genuinely integrated bio-psycho-social model. *Clin. Schizophr. Relat. Psychoses* 2, 235–254. <https://doi.org/10.3371/CSRP.2.3.5>.
- Redstone, L., 2011. *Hearing voices: how do substances affect the relationship with voices, coping and compliance?* [doctoral dissertation]. University of Lincoln, Lincoln.
- Rogers, P., Watt, A., Gray, N.S., MacCulloch, M., Gournay, K., 2002. Content of command hallucinations predicts self-harm but not violence in a medium secure unit. *J. Forensic Psychiatry* 13, 251–262. <https://doi.org/10.1080/09585180210150096>.
- Salvatore, G., Lysaker, P.H., Popolo, R., Procacci, M., Carcione, A., Dimaggio, G., 2012. Vulnerable self, poor understanding of others' minds, threat anticipation and cognitive biases as triggers for delusional experience in schizophrenia: a theoretical model. *Clin. Psychol. Psychother.* 19, 247–259. <https://doi.org/10.1002/cpp.746>.
- Salvatore, G., Buonocore, L., Ottavi, P., Popolo, R., Dimaggio, G., 2018. Metacognitive interpersonal therapy for treating persecutory delusions in schizophrenia. *Am. J. Psychother.* 71, 164–174. <https://doi.org/10.1176/appi.psychotherapy.20180039>.
- Sartorius, N., Jablensky, A., Korten, A., Ernberg, G., Anker, M., Cooper, J.E., Day, R., 1986. Early manifestations and first-contact incidence of schizophrenia in different cultures: a preliminary report on the initial evaluation phase of the WHO collaborative study on determinants of outcome of severe mental disorders. *Psychol. Med.* 16, 909–928. <https://doi.org/10.1017/S0033291700011910>.
- Shawyer, F., Mackinnon, A., Farhall, J., Trauer, T., Copolov, D., 2003. Command hallucinations and violence: implications for detention and treatment. *Psychiatry Psychol. Law* 10, 97–107. <https://doi.org/10.1375/ppl.2003.10.1.97>.
- Shawyer, F., Mackinnon, A., Farhall, J., Sims, E., Blaney, S., Yardley, P., Daly, M., Mullen, P., Copolov, D., 2008. Acting on harmful command hallucinations in psychotic disorders: an integrative approach. *J. Nerv. Ment. Dis.* 196, 390–398. <https://doi.org/10.1097/NMD.0b013e318171093b>.
- Shiel, L., Demjén, Z., Bell, V., 2022. Illusory social agents within and beyond voices: a computational linguistics analysis of the experience of psychosis. *Br. J. Clin. Psychol.* 61, 349–363. <https://doi.org/10.1111/bjc.12329>.
- Stanghellini, G., Cutting, J., 2003. Auditory verbal hallucinations – breaking the silence of inner dialogue. *Psychopathology* 36, 120–128. <https://doi.org/10.1159/000071256>.
- Stompe, T., Bauer, S., Ortwein-Swoboda, G., Schanda, H., Karakula, H., Rudaleviciene, P., Chaudhry, H.R., Idemudia, E.S., Gschaidner, S., 2006. Delusions of guilt: the attitude of Christian and Muslim schizophrenic patients toward good and evil and the responsibility of men. *J. Muslim Ment. Health* 1, 43–56. <https://doi.org/10.1080/15564900600654294>.
- Suhail, K., Ghauri, S., 2010. Phenomenology of delusions and hallucinations in schizophrenia by religious convictions. *Ment. Health Relig. Cult.* 13, 245–259. <https://doi.org/10.1080/13674670903313722>.
- Tenny, S., Hoffman, M.R., 2025. Prevalence. In: *StatPearls*. StatPearls Publishing, Treasure Island (FL).
- Upthegrove, R., Broome, M.R., Caldwell, K., Ives, J., Oyebode, F., Wood, S.J., 2016. Understanding auditory verbal hallucinations: a systematic review of current evidence. *Acta Psychiatr. Scand.* 133, 352–367. <https://doi.org/10.1111/acps.12531>.
- Varese, F., Morrison, A.P., Beck, R., Heffernan, S., Law, H., Bentall, R.P., 2016. Experiential avoidance and appraisals of voices as predictors of voice-related distress. *Br. J. Clin. Psychol.* 55, 320–331. <https://doi.org/10.1111/bjc.12102>.
- Wilkinson, S., Fernyhough, C., 2017. Auditory verbal hallucinations and inner speech: A predictive processing perspective. In: Radman, Z. (Ed.), *Before Consciousness: In Search of the Fundamentals of Mind*, Wellcome Trust–Funded Monographs and Book Chapters. Imprint Academic, Ltd., Exeter (UK).