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# Suicidal ideation and behaviour in patients with persecutory delusions: Prevalence, symptom associations, and psychological correlates

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ABSTRACT

*Background:* To determine the prevalence of suicidal ideation and behaviour - and their correlates - in patients with persecutory delusions.
*Methods:* 110 patients with persecutory delusions in the context of non-affective psychosis were assessed for suicidal thoughts and behaviours over the past month. Symptom and psychological assessments were also completed.
*Results:* The severity of suicidal ideation was: no suicidal ideation (n = 26, 23.6%); wish to be dead (n = 21, 19.1%); nonspecific active suicidal thoughts (n = 14, 12.7%); suicidal thoughts with methods but no intent (n = 29, 26.4%); suicidal thoughts with intent but no specific plan (n = 13, 11.8%); and suicidal intent with plan (n = 7, 6.4%). In the past month, five patients (4.5%) had made an actual, interrupted, or aborted suicide attempt. The severity of suicidal ideation was associated with higher levels of depression, paranoia, hallucinations, anger, insomnia, negative beliefs about the self and others, pessimism, worry, and delusion safety-seeking behaviours and lower levels of psychological well-being and reward responsiveness. Severity of ideation was not associated with cannabis or alcohol use, working memory, pain, or meaningful activity levels.
*Conclusions:* Patients with persecutory delusions are typically in a severe state of psychological stress, and at risk of suicide, as indicated by very high levels of suicidal ideation. This exploratory study also identifies correlates of suicidal ideation that could be investigated in causal research designs.


## 1. Introduction

Suicidal ideation, thinking about killing oneself, is an obvious marker of high psychological stress. Ideally, the presence of such thoughts in patients attending mental health services would be an impetus for concerted efforts to help reduce the distress. Typically, the presence of suicidal thoughts is most often considered within risk assessment, when considering whether a person will attempt to kill themselves. There is a chain – sometimes termed 'ideation to action' - of suicidal thoughts, developing a plan, intending to act, making an attempt, and making a lethal attempt [1,2]. The lifetime general population prevalence rate of suicidal ideation is 9% and for suicide attempts it is 3% [3]. Although most people who have suicidal ideation do not make a suicide attempt, suicidal ideation is still a key link in the chain: 29% of individuals who have had suicidal ideation make a suicide attempt and 56% of individuals with suicidal ideation who had a plan make an attempt [3]. In this paper, we set out to describe the prevalence of suicidal ideation and behaviours specifically in patients experiencing persecutory delusions in the context of schizophrenia and related disorders.

Suicidal ideation and behaviour have been studied in relation to the diagnosis of schizophrenia. People with schizophrenia have 12.9 times the risk of dying from suicide than other members of the general population [4]. Approximately 5% of patients with schizophrenia die by suicide [5], with almost half of these deaths occurring within the first five years of diagnosis [6]. In a meta-analysis, Hubers and colleagues [7] found that suicidal ideation in patients with schizophrenia raised the risk of death by suicide six-fold compared with patients without suicidal ideation. The link between suicidal ideation and suicide may even be stronger in schizophrenia than in mood disorders [8]. There are surprisingly few estimates, but approximately one quarter of patients with schizophrenia have current suicidal ideation [9,10].

The diagnosis of schizophrenia comprises multiple independent psychotic experiences [11]. Our view is that advances in understanding and treatment will follow from a focussed approach on each of the different psychotic experiences. Our exemplar has been a programme of work developing the theoretical understanding of persecutory

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delusions and using that knowledge to develop a much more efficacious treatment [12,13]. The practical implication is that we recruit and treat patients who have a current persecutory delusion, one of the most common presentations in schizophrenia. These individuals have other psychotic experiences, such as hallucinations, but our clinical focus is on reducing the paranoia, enhancing psychological well-being, and increasing meaningful activity. We wished to determine levels of suicidal ideation and behaviours in this group as indicators of both acute psychological distress and risk of suicide. Patients experiencing persecutory delusions in the context of schizophrenia are likely to have high levels of suicidal ideation and behaviours: rates of current suicidal ideation have been found to be greater for patients with positive symptoms [14].

Paranoid thinking specifically has been found to be associated with suicidal ideation. In a UK epidemiological study with over seven thousand adults, thinking that a group of people is plotting to cause you serious harm or injury was associated with 27 times greater odds of also reporting suicidal ideation in the past year and 17 times greater odds of ever having made a suicide attempt [15]. In a network analysis with 1685 adolescents, suicidal ideation occurring at some point over the lifetime was connected to hearing voices, persecutory ideation, and social anxiety [16]. In a cross-sectional structural equation model with 124 patients with schizophrenia, anxiety and depression connected persecutory ideation and hallucinations with suicidal ideation and plans [17]. And in a study of 78 patients with schizophrenia, persecutory ideation was particularly linked to feelings of defeat and entrapment and suicidal ideation [18].

Defeat and entrapment are at the heart of the psychological understanding of suicide [19,20], although there is no single cause, with psychiatric disorder, hopelessness, psychosocial crisis, and impulsivity all implicated [21]. In a study with 21 patients with persecutory delusions, suicidal ideation was associated with low self-esteem, negative social comparison, low self-compassion, negative beliefs about the self, depression, and fears about madness [22]. We wished to identify from a broad range of psychiatric symptoms and psychological processes those that are correlates of suicidal ideation in patients with persecutory delusions. By administering to a cohort of patients being treated by our team the Columbia-Suicide Severity Rating Scale [23] - which aims to be a single standard measure that assesses whether a person has thought about suicide, made any plans or preparation, whether there is intent, and whether an attempt has been made – we could provide a detailed description of suicidal thoughts and behaviours and link these to potentially causally important correlates.

### 1.1. Aims of the study

In this study, we aimed to describe for the first time the levels of suicidal ideation and behaviours that occur in patients attending clinical services with current persecutory delusions in the context of non-affective psychosis. We also aimed to identify correlates that may plausibly contribute to the occurrence of suicidal ideation. Such correlates could then become a focus of research using causal research designs. We included symptom assessments of depression, insomnia, anger, hallucinations, and alcohol and drug use, and assessments of psychological processes such as beliefs about the self, worry, reward responsiveness, and paranoia safety-seeking behaviours.

## 2. Material and methods

### 2.1. Participants

One hundred and ten patients with persistent persecutory delusions in the context of non-affective psychosis took part in the study during the baseline assessment for the Feeling Safe Trial [24]. The inclusion criteria were: aged 16 years or above; persistent (at least 3 months) persecutory delusion (as defined by Freeman & Garety [25]), currently held with at least 60% conviction; and a primary diagnosis of schizophrenia-spectrum psychosis (non-affective psychosis). The exclusion criteria were: current receipt of another psychological therapy; insufficient comprehension of English; primary diagnosis of alcohol, or drug, or personality disorders; being treated in forensic services; diagnosis of organic syndrome; or a significant learning disability. The patients were the first cohort entered into the trial. The trial had received approval from an NHS Research Ethics Committee, and written informed consent was obtained for all participants.

### 2.2. Assessments

#### 2.2.1. Suicidal ideation and behaviours

*Columbia-Suicide Severity Rating Scale* (*C-SSRS*) [23]. Draft guidance from the United States Food and Drug Administration [26] has recommended the C-SSRS for measuring and classifying suicidal ideation and behaviour in clinical trials. This interviewer-rated measure from a semi-structured interview assesses four suicide constructs for the time-period of the last month. First, the severity of the highest level of suicidal ideation experienced by the patient is rated on an ordinal 6-point scale from 0 (none) to 5 (suicidal intent with plan). A rating of 1 concerns a wish to be dead or wish to go to sleep and not wake up. Individuals have non-specific thoughts about no longer wanting to be alive or sentient, and may say that they do not want to endure another day. For a rating of 2 (Non-specific active suicidal thoughts), individuals are considering the possibility of ending their own life, but without particular methods in mind. They are often considering whether or not they could or would take their own life. A rating of 3 concerns active suicidal ideation with at least one method considered without intent to act. Individuals often have several possible methods in mind, and may be deliberating the costs and benefits of each method or whether they are capable of carrying out each method. A rating of 4 concerns active suicidal ideation with some intent to act (and a method), without a specific plan. Individuals often have fewer methods in mind with no current specific plans but often report expecting to end their life when things become unmanageable. A rating of 5 concerns active suicidal ideation with a specific plan and intent to act. These individuals often have a single method in mind. They may have chosen a day, date, or time and may have taken steps towards killing themselves, such as collecting materials or writing a suicide note. Greater severity of suicidal ideation is associated with greater risk of suicidal behaviours. Second, the intensity of suicidal ideation (for the severest level experienced) is rated for frequency, duration, controllability, deterrents, and reason for ideation. Each intensity scale item is rated on an ordinal 0–5 scale, with higher scores indicating greater severity. A total intensity score is created from the sum of the five subscales, although we also report on the individual items as the internal reliability of the total intensity score was low in the current study ($n = 81$, Cronbach's alpha $= 0.41$). Third, the occurrence of suicidal behaviours is rated on a nominal scale. Only the severest level of suicidal behaviour for an individual is rated. Fourth, the lethality of an actual suicide attempt is rated on an ordinal scale. The assessors were graduate psychologists, trained and supervised by clinical psychologists.

#### 2.2.2. Psychiatric symptoms

*Beck Depression Inventory-II* (*BDI*) [27]. The BDI-II is a self-report 21-item scale, with each item rated on a four point scale (0–3), for the assessment of depression over the past fortnight. Higher scores indicate higher levels of depression.

*Psychotic Symptom Rating Scales – Delusions* (*PSYRATS*) [28]. The PSYRATS-Delusions is a six-item measure that assesses the conviction, preoccupation, distress, and disruption associated with delusions. The persecutory delusion was rated over the last week. Higher scores indicate greater severity.

*Green et al. Paranoid Thoughts Scale* (*GPTS*) [29]. The GPTS is a thirty-two item measure of paranoid thinking. Part A assesses ideas of reference (e.g. 'It was hard to stop thinking about people talking about me

behind my back') and Part B assesses ideas of persecution (e.g. 'I was convinced there was a conspiracy against me'). Each item is rated on a 5-point scale. Higher scores indicate greater levels of paranoid thinking. The scale was completed for the period of the previous fortnight.

*Cardiff Anomalous Perceptions Scale-Hallucinations* (*CAPS*) [30]. This scale comprises eleven hallucination items taken from the CAPS. Each item (e.g. 'Hear voices commenting on what you're thinking or doing') is rated on a 0 (not at all) to 5 (daily) scale. Higher scores indicate greater levels of hallucinatory experiences.

*Dimensions of Anger Reactions* (*DAR-5*) [31]. The scale comprises five items (e.g. 'I found myself getting angry at people or situations') assessing levels of anger over the past four weeks. Each item is rated on a 1 (none of the time) to 5 (all or almost all of the time) scale. Higher scores indicate greater levels of anger.

*Insomnia Severity Index* (*ISI*) [32]. The ISI is a seven-item self-report questionnaire based upon the insomnia criteria of the Diagnostic and Statistical Manual of Mental Disorders [33]. The scale assesses sleep-onset and sleep maintenance difficulties, associated distress, and interference with daily functioning. Each item is rated on a 0–4 scale. The time period is the past fortnight. Higher scores indicate the presence of symptoms of insomnia.

*Maudsley Addiction Profile* (*MAP*) [34]. Respondents are asked directly about their use over the past month of a range of illicit drugs, including cannabis. Use of alcohol was also recorded.

#### 2.2.3. Psychological correlates

*Brief Core Schema Scales* (*BCSS*) [35]. The BCSS comprises 24 items assessing negative and positive beliefs about the self and others, each rated on a five-point scale (0–4). Four subscale scores are obtained: negative self (e.g. 'I am unloved'), positive self (e.g. 'I am respected'), negative other (e.g. 'Other people are hostile'), positive other (e.g. 'Other people are fair'). Higher scores indicate greater endorsement of items.

*Penn State Worry Questionnaire* (*PSWQ*) [36]. The PSWQ is the most established measure of trait worry style and has been used in non-clinical and clinical populations. Each of the sixteen items is rated on a 5-point scale. Higher scores indicate a greater tendency to worry.

*Safety Behaviours Questionnaire—Persecutory Delusions* (*SBQ*) [37]. The SBQ is a semi-structured interview assessing the use of safety-seeking behaviours (actions, such as avoidance, that prevent the processing of disconfirmatory evidence) in the last month with the intention of reducing persecutory threat. After a safety behaviour has been elicited, the participant is asked to rate its frequency over the last month on a four-point scale (1 = behaviour definitely occurred on at least one occasion to 4 = present more or less continuously). Higher scores indicate greater use of safety-seeking behaviours.

*Warwick-Edinburgh Mental Well-being Scale* (*WEMWBS*) [38]. The WEMWBS is a fourteen-item scale assessing well-being over the past fortnight. Each item is rated on a 1 (none of the time) to 5 (all of the time) scale, and therefore the total score can range from 14 to 70, with higher scores indicating a greater level of well-being.

*The Temporal Experience of Pleasure Scale* (*TEPS*) [39]. The 10-item anticipatory pleasure scale was used as a marker of reward responsiveness and anhedonia. Each item (e.g. 'When I think about eating my favorite food, I can almost taste how good it is') is rated on a 6-point scale (1 = very false for me to 6 = very true for me). Higher scores indicate lower levels of anticipatory pleasure.

*Wechsler Adult Intelligence Scale III* (*WAIS-III*) - *Working memory tasks* [40]. Three working memory tasks were used: digit span forwards (repeating back series of numbers), digit span backwards (repeating back series of numbers in reverse), and letter-number sequencing (sorting and recalling a series of letters and numbers). Higher scores indicate better working memory performance.

*EuroQoL* (*EQ-5D-5*) – *pain item* (Brooks et al. [41]). We used the single pain item from the questionnaire. Pain or discomfort is rated on a five-point scale: 1 = I have no pain or discomfort, 2 = have slight pain or discomfort, 3 = I have moderate pain or discomfort, 4 = I have severe pain or discomfort, 5 = I have extreme pain or discomfort. Higher scores indicate a higher level of pain.

*Time budget* (*TB*) [42]. This time budget measure assesses meaningful activity levels over the past week, completed during a structured interview, with 4 time blocks for each day rated from 0 to 4. The rating scale is: 0 = nothing, 1 = predominantly passive activity, 2 = an independent activity requiring some planning and motivation, 3 = several 2-rated activities completely filling a time period or a more complex and demanding, but shorter, activity, 4 = time period filled with a variety of demanding independent activities. Higher scores indicate higher levels of meaningful activity.

### 2.3. Analysis

This was predominately a descriptive study, with the main reporting involving the proportion of the patient sample having suicidal ideation and behaviours. Associations between suicidal ideation and the symptom and psychological variables were tested using Pearson correlations, *t*-tests, or analysis of variance. The exceptions were that Spearman's correlations were used for the testing of associations with two variables that were skewed (deterrents for acting on suicidal ideation and alcohol consumption). All statistical testing was two-tailed and carried out with SPSS Version 22.0 [43]. We did not alter significance levels for multiple testing, agreeing with the view that "simply describing what tests of significance have been performed, and why, is generally the best method of dealing with multiple comparisons" [44].

## 3. Results

### 3.1. Basic demographic and clinical information

The average age of the participants was 42.3 (SD = 11.5) years old. There were slightly more men (n = 65, 59.1%) than women (n = 45, 40.9%). The clinical diagnoses (taken from medical notes) were schizophrenia (n = 70, 63.6%), schizo-affective disorder (n = 21, 19.1%), delusional disorder (n = 3, 2.7%), psychosis NOS (n = 16, 14.5%). The ethnicities were: White (n = 92, 83.6%), Black Caribbean (n = 7, 6.4%), Pakistani (n = 3, 2.7%), Indian (n = 3, 2.7%), Black African (n = 2, 1.8%), Black Other (n = 1, 0.9%), Chinese (n = 1, 0.9%), and other (n = 1, 0.9%). Most participants were single (n = 78, 70.9%), with others married or in a civil partnership (n = 22, 20.0%), co-habiting (n = 1, 0.9%), or divorced (n = 9, 8.2%). The majority were unemployed (n = 86, 78.2%). Levels of the current persecutory delusions were high (n = 110, mean PSYRATS total = 18.5, SD = 2.5), with the conviction with which the beliefs were held at an average of 87.2% (SD = 12.4, n = 110). Patients were hearing voices not at all (n = 33, 30.0%), rarely (n = 8, 7.3%), once a month (n = 3, 2.7%), once a week (n = 5, 4.5%), several times a week (n = 27, 24.5%), or daily (n = 34, 30.9%). Levels of depression were high (n = 110, mean BDI score = 31.9, SD = 12.0). 107 (97.3%) patients were prescribed anti-psychotic medication. 105 participants were out-patients, and five were in-patients. Mean scores on all the measures are summarised in Table 1.

### 3.2. Levels of suicidal ideation and behaviours

Table 2 summarises the degree to which the patient group experienced suicidal thoughts and behaviours. It can be seen that over three-quarters of the patients had experienced suicidal ideation. For approximately two-thirds of patients having suicidal ideation, the thoughts were occurring at least weekly. Most of the patients thought about ending their lives to relieve the pain they experienced rather than to gain attention. The majority reported deterrents to acting on the suicidal thoughts. Six patients (5.6%) had shown suicide-related behaviours in the past month.

**Table 1**
Mean scores on the measures.

| Variable | n | Mean | SD |
|---|---|---|---|
| Severity of suicidal ideation (C-SSRS) | 110 | 2.03 | 1.57 |
| Intensity of suicidal ideation total (C-SSRS) | 81 | 12.63 | 3.77 |
| Frequency of suicidal ideation (C-SSRS) | 84 | 2.48 | 1.36 |
| Duration of suicidal ideation (C-SSRS) | 84 | 2.10 | 1.21 |
| Controllability of suicidal ideation (C-SSRS) | 84 | 2.38 | 1.71 |
| Deterrents for acting on suicidal ideation (C-SSRS) | 82 | 1.32 | 1.04 |
| Reasons for suicidal ideation (C-SSRS) | 83 | 4.29 | 1.49 |
| Depression (BDI) | 110 | 31.90 | 11.96 |
| Delusions (PSYRATS) | 110 | 18.45 | 2.46 |
| Paranoia (GPTS) | 110 | 114.18 | 26.06 |
| Hallucinations (CAPS) | 110 | 23.60 | 14.44 |
| Anger (DAR) | 110 | 10.82 | 4.68 |
| Insomnia (ISI) | 110 | 14.36 | 6.94 |
| Negative-self beliefs (BCSS) | 110 | 12.18 | 5.52 |
| Positive-self beliefs (BCSS) | 110 | 7.44 | 5.07 |
| Negative-other beliefs (BCSS) | 110 | 14.24 | 5.14 |
| Positive-other beliefs (BCSS) | 110 | 9.12 | 4.46 |
| Pessimism (BDI item) | 110 | 1.76 | 0.94 |
| Worry (PSWQ) | 110 | 63.66 | 10.19 |
| Paranoia defence behaviour (SBQ) | 110 | 35.45 | 17.00 |
| Psychological well-being (WEMWBS) | 110 | 34.24 | 8.34 |
| Reward responsiveness (TEPS) | 110 | 29.55 | 11.72 |
| Digit span forwards (WAIS-III) | 107 | 9.33 | 2.36 |
| Digit span backwards (WAIS-III) | 106 | 5.75 | 1.99 |
| Letter-number sequencing (WAIS-III) | 106 | 7.90 | 3.03 |
| Pain or discomfort (EQ-5D-5) | 110 | 2.25 | 1.05 |
| Meaningful activity (TB) | 108 | 54.44 | 14.67 |

**Table 2**
Levels of suicidal ideation and behaviours.

| | n | % |
|---|---|---|
| 1. Severity of suicidal ideation (for 110 patients) | | |
| None | 26 | 23.6 |
| Wish to be dead | 21 | 19.1 |
| Non-specific active suicidal thoughts | 14 | 12.7 |
| Active suicidal ideation with any methods without intent to act | 29 | 26.4 |
| Active suicidal ideation with some intent to act, without specific plan | 13 | 11.8 |
| Active suicidal ideation with specific plan and intent to act | 7 | 6.4 |
| 2. Intensity of suicidal ideation (for the 84 patients with suicidal ideation) | | |
| Frequency | | |
| <Less than once a week | 30 | 35.7 |
| Once a week | 13 | 15.5 |
| 2–5 times in a week | 19 | 22.6 |
| Daily or almost daily | 15 | 17.9 |
| Many times each day | 7 | 8.3 |
| Duration | | |
| Fleeting – few seconds or minutes | 36 | 42.9 |
| <1 h/some of the time | 19 | 22.6 |
| 1–4 h/a lot of the time | 20 | 23.8 |
| 4–8 h/most of the day | 3 | 3.6 |
| >8 h/persistent of continuous | 6 | 7.1 |
| Controllability | | |
| Does not attempt to control thoughts | 13 | 15.5 |
| Easily able to control thoughts | 22 | 26.2 |
| Can control thoughts with little difficulty | 8 | 9.5 |
| Can control thoughts with some difficulty | 14 | 16.7 |
| Can control thoughts with a lot of difficulty | 15 | 17.9 |
| Unable to control thoughts | 12 | 14.3 |
| Deterrents | | |
| Does not apply | 6 | 7.3 |
| Deterrents definitely stopped you from attempting suicide | 60 | 73.2 |
| Deterrents probably stopped you | 9 | 11.0 |
| Uncertain that deterrents stopped you | 2 | 2.4 |
| Deterrents most likely did not stop you | 1 | 1.2 |
| Deterrents definitely did not stop you | 4 | 4.9 |
| Missing data | 2 | |
| Reason | | |
| Does not apply | 6 | 7.2 |
| Completely to get attention, revenge or a reaction from others | 2 | 2.4 |
| Mostly to get attention, revenge or a reaction from others | 2 | 2.4 |
| Equally to get attention, revenge or a reaction from others and to end/stop the pain | 4 | 4.8 |
| Mostly to end or stop the pain (you couldn't go on living with the pain or how you were feeling) | 7 | 8.4 |
| Completely to end or stop the pain (you couldn't go on living with the pain or how you were feeling) | 62 | 74.7 |
| Missing data | 1 | |
| 3. Suicidal behaviour (for 110 patients) | | |
| None | 100 | 92.6 |
| Actual attempt | 1 | 0.9 |
| Interrupted attempt | 3 | 2.8 |
| Aborted attempt | 1 | 0.9 |
| Preparatory acts or behaviours | 1 | 0.9 |
| Non-suicidal self-injurious behaviour | 2 | 1.9 |
| Missing | 2 | |
| 4. Actual lethality (for the one actual attempt) | | |
| No or very minor physical damage | 0 | 0 |
| Minor physical damage | 0 | 0 |
| Moderate physical damage | 0 | 0 |
| Moderately severe physical damage | 1 | 100 |
| Severe physical damage | 0 | 0 |
| Death | 0 | 0 |

The C-SSRS suicidal severity scale correlated with the BDI suicidal ideation item, $n = 110$, $r = 0.695$, $p < .001$. There was no difference in C-SSRS suicidal severity score by diagnosis, $F(3, 106) = 0.781$, $p = .507$, or gender, $t(108) = -0.587$, $p = .558$. Age was also not associated with severity of suicidal ideation, $n = 110$, $r = -0.04$, $p = .690$.

Severity of suicidal ideation was significantly associated with intensity of suicidal ideation, $n = 81$, $r = 0.44$, $p < .001$, frequency of suicidal thoughts, $n = 84$, $r = 0.32$, $p = .003$, duration of suicidal thoughts, $n = 84$, $r = 0.39$, $p < .001$, controllability, $n = 84$, $r = 0.24$, $p = .030$, but not significantly with deterrents to act, $n = 82$, $r = 0.17$, $p = .130$, or reasons for ideation, $n = 83$, $r = 0.14$, $p = .213$.

### 3.3. Correlates of suicidal ideation

Table 3 reports the correlations between severity and intensity of suicidal ideation and the symptom variables. Depression had a large effect size association with the severity of suicidal ideation, but all symptom variables, apart from alcohol consumption, were positively associated, showing small-medium effect sizes. The correlation between the severity of ideation and delusion severity did not reach statistical significance, but given that all patients were selected for having a severe delusion there was clearly limited variance within the delusion severity variable.

Table 4 reports the correlations between severity and intensity of suicidal ideation and the psychological variables. Severity of suicidal ideation was positively associated with negative-self beliefs, pessimism, worry, negative-other beliefs, lower reward responsiveness, and use of delusion safety-seeking behaviours, and negatively associated with psychological well-being, positive-other beliefs, and positive-self beliefs. There was no significant association between the severity of suicidal ideation and working memory, pain, or level of meaningful activity.

Only seven individuals (6.3%) reported using cannabis in the past month and they did not have significantly higher levels of suicidal ideation severity, $n = 110$, $t(108) = -1.198$, $p = .233$, or intensity, $n = 81$, $t(79) = 0.199$, $p = .843$. There were no significant differences in levels of suicidal ideation severity, $n = 110$, $F(2,107) = 0.295$, $p = .745$, or intensity, $n = 81$, $F(92,78) = 0.783$, $p = .460$, between patients who did not drink in the past month ($n = 48$, 43.6%), patients who drank on fewer than 15 days in the month ($n = 48$, 43.6%), and patients who drank on at least 15 days of the month ($n = 14$, $n = 12.7$%).

## 4. Discussion

This study provides a detailed description of the types of suicidal thoughts and behaviours that occur in patients with persecutory delusions in the context of non-affective psychotic disorders. There is a clear finding: suicidal ideation is the normal presentation for patients

**Table 3**
Symptom correlates of suicidal ideation.

| Variable | Columbia-Suicide Severity Rating Scale | | | | | | |
|---|---|---|---|---|---|---|---|
| | Severity of suicidal ideation (n = 110) | Total intensity of suicidal ideation (n = 81) | Frequency of suicidal ideation (n = 84) | Duration of suicidal ideation (n = 84) | Controllability of suicidal ideation (n = 84) | Deterrents for acting on suicidal ideation (n = 82) | Reasons for suicidal ideation (n = 83) |
| Depression (BDI) | 0.550 | 0.473 | 0.218 | 0.294 | 0.307 | 0.112 | 0.383 |
| | p < .001 | p < .001 | p = .047 | p = .007 | p = .005 | p = .318 | p < .001 |
| Depression (BDI minus suicide item) | 0.523 | 0.461 | 0.211 | 0.277 | 0.303 | 0.112 | 0.385 |
| | p < .001 | p < .001 | p = .054 | p = .011 | p = .005 | p = .318 | p < .001 |
| Persecutory delusion (PSYRATS) | 0.180 | 0.198 | 0.102 | 0.128 | 0.110 | −0.114 | 0.234 |
| | p = .060 | p = .076 | p = .356 | p = .246 | p = .320 | p = .308 | p = .033 |
| Paranoia (GPTS) | 0.221 | 0.134 | −0.045 | 0.173 | 0.234 | −0.186 | 0.161 |
| | p = .021 | p = .232 | p = .681 | p = .117 | p = .032 | p = .095 | p = .147 |
| Hallucinations (SPEQ) | 0.220 | 0.175 | 0.088 | 0.143 | 0.245 | −0.157 | 0.083 |
| | p = .021 | p = .118 | 0.427 | p = .196 | p = .025 | p = .160 | p = .456 |
| Anger (DAR) | 0.284 | 0.169 | −0.011 | 0.157 | 0.243 | −0.199 | 0.112 |
| | p = .003 | p = .132 | p = .921 | p = .155 | p = .026 | p = .073 | p = .312 |
| Insomnia (ISI) | 0.204 | −0.037 | −0.172 | 0.004 | 0.187 | −0.107 | −0.037 |
| | p = .033 | p = .742 | p = .119 | p = .975 | p = .089 | p = .339 | p = .741 |
| Alcohol consumption (MAP) | 0.065 | 0.069 | −0.022 | 0.166 | −0.018 | −0.082 | 0.171 |
| | p = .497 | p = .541 | p = .844 | p = .130 | p = .872 | p = .466 | p = .122 |

Pearson correlations are reported, apart for the variables of 'deterrents for acting on suicidal ideation' and 'alcohol consumption' where Spearman's correlations are reported.

**Table 4**
Psychological and behavioural correlates of suicidal ideation.

| Variable | Columbia-Suicide Severity Rating Scale | | | | | | |
|---|---|---|---|---|---|---|---|
| | Severity of suicidal ideation | Total intensity of suicidal ideation | Frequency of suicidal ideation | Duration of suicidal ideation | Controllability of suicidal ideation | Deterrents for acting on suicidal ideation | Reasons for suicidal ideation |
| Negative-self beliefs (BCSS) | 0.461 | 0.409 | 0.345 | 0.127 | 0.292 | 0.188 | 0.276 |
| | p < .001 | p < .001 | p = .001 | p = .251 | p = .007 | p = .091 | p = .011 |
| | n = 110 | n = 81 | n = 84 | n = 84 | n = 84 | n = 82 | n = 83 |
| Positive-self beliefs (BCSS) | −0.199 | −0.213 | −0.193 | 0.025 | −0.151 | −0.106 | −0.182 |
| | p = .037 | p = .056 | p = .079 | p = .818 | p = .169 | p = .341 | p = .100 |
| | n = 110 | n = 81 | n = 84 | n = 84 | n = 84 | n = 82 | n = 83 |
| Negative-other beliefs (BCSS) | 0.259 | 0.242 | 0.054 | 0.236 | 0.298 | −0.058 | 0.153 |
| | p = .006 | p = .030 | p = .625 | p = .030 | p = .006 | p = .605 | p = .168 |
| | n = 110 | n = 81 | 84 | n = 84 | n = 84 | n = 82 | n = 83 |
| Positive-other beliefs (BCSS) | −0.238 | −0.216 | −0.123 | −0.140 | −0.113 | −0.028 | −0.227 |
| | p = .012 | p = .053 | p = .265 | p = .204 | p = .305 | p = .806 | p = .039 |
| | n = 110 | n = 81 | n = 84 | n = 84 | n = 84 | n = 82 | n = 83 |
| Pessimism (BDI item) | 0.359 | 0.274 | 0.194 | 0.175 | 0.210 | 0.158 | 0.119 |
| | p < .001 | p = .013 | p = .077 | p = .112 | p = .055 | p = .157 | p = .284 |
| | n = 110 | n = 81 | n = 84 | n = 84 | n = 84 | n = 82 | n = 83 |
| Worry (PSWQ) | 0.323 | 0.180 | 0.184 | 0.182 | 0.225 | −0.061 | 0.006 |
| | p = .001 | p = .108 | p = .094 | p = .097 | p = .039 | p = .587 | p = .954 |
| | n = 110 | n = 81 | n = 84 | n = 84 | n = 84 | n = 82 | n = 83 |
| Delusion defences (SBQ) | 0.229 | 0.157 | 0.203 | 0.072 | 0.120 | 0.103 | −0.045 |
| | p = .016 | p = .162 | p = .063 | p = .514 | p = .277 | p = .359 | p = .687 |
| | n = 110 | n = 81 | n = 84 | n = 84 | n = 84 | n = 82 | n = 83 |
| Psychological well-being (WEMWBS) | −0.320 | −0.415 | −0.217 | −0.190 | −0.344 | −0.072 | −0.304 |
| | p = .001 | p ≤0.001 | p = .047 | p = .083 | p = .001 | p = .518 | p = .005 |
| | n = 110 | n = 81 | n = 84 | n = 84 | n = 84 | n = 82 | n = 83 |
| Reward responsiveness (TEPS) | 0.234 | 0.266 | 0.272 | 0.020 | 0.249 | 0.238 | 0.058 |
| | p = .014 | p = .017 | p = .012 | p = .859 | p = .022 | p = .031 | p = .604 |
| | n = 110 | n = 81 | n = 84 | n = 84 | n = 84 | n = 82 | n = 83 |
| Digit span forwards (WAIS-III) | 0.165 | 0.130 | 0.150 | 0.129 | −0.040 | 0.089 | −0.028 |
| | p = .089 | p = .252 | p = .179 | p = .248 | p = .724 | p = .433 | p = .804 |
| | n = 107 | n = 79 | n = 82 | n = 82 | n = 82 | n = 80 | n = 81 |
| Digit span backwards (WAIS-III) | −0.004 | 0.041 | 0.009 | 0.018 | −0.031 | −0.020 | 0.063 |
| | p = .969 | p = .724 | p = .937 | p = .875 | p = .783 | p = .864 | p = .578 |
| | n = 106 | n = 78 | n = 81 | n = 81 | n = 81 | n = 79 | n = 80 |
| Letter-number sequencing (WAIS-III) | −0.075 | −0.071 | 0.019 | 0.034 | −0.194 | −0.156 | 0.004 |
| | p = .445 | p = .535 | p = .868 | p = .764 | p = .082 | *p* = .171 | p = .969 |
| | n = 106 | n = 78 | n = 81 | n = 81 | n = 81 | n = 79 | n = 80 |
| Pain or discomfort (EQ-5D-5) | 0.085 | 0.015 | −0.046 | −0.067 | 0.072 | 0.068 | −0.065 |
| | p = .378 | p = .893 | p = .679 | p = .547 | p = .512 | p = .541 | p = .557 |
| | n = 110 | n = 81 | n = 84 | n = 84 | n = 84 | n = 82 | n = 83 |
| Meaningful activity (TB) | 0.032 | −0.129 | 0.023 | −0.042 | −0.138 | −0.093 | −0.117 |
| | p = .741 | p = .253 | p = .834 | p = .705 | p = .213 | p = .407 | p = .297 |
| | n = 108 | n = 81 | n = 83 | n = 83 | n = 83 | n = 82 | n = 82 |

Pearson correlations are reported, apart for the variables of 'deterrents for acting on suicidal ideation' and 'alcohol consumption' where Spearman's correlations are reported.

with persecutory delusions. It reflects the severity of the distress that many patients with persecutory delusions experience. It also indicates that this group is likely to be at high risk of suicide. Only one-quarter of the patients reported the complete absence of any type of suicidal thinking. A further fifth of patients reported wishing they were dead, rather than thinking of killing themselves, but such thoughts are known to be associated with a raised risk of later suicide [45]. Around a fifth of the participant group may have had a particularly severe presentation, with very frequent suicidal thoughts, a degree of intent to act, and limited controllability. Possibly preventing a much higher level of suicidal behaviours, the large majority of patients could identify deterrents for acting on suicidal thoughts. The overall picture is consistent with the existing literature that has shown that suicidal ideation is raised in schizophrenia and may be further raised in those with current psychotic experiences. Suicidal ideation is a clear concern in most patients with current persecutory delusions.

Plausible factors that may raise the risk of suicidal ideation and behaviours were tested as correlates. Depression was clearly most strongly associated with suicidal ideation. Difficulties sleeping, hallucinations, paranoia, and anger were all correlated with suicidal ideation. The psychological processes linked to severity of suicidal ideation were negative beliefs about the self and others, fewer positive beliefs about the self and others, pessimism, worry, lower anticipation of pleasure, and paranoia-related defence behaviours. Working memory performance, pain, and levels of meaningful activity were unrelated to suicidal ideation. In the integrated motivational–volitional model of suicidal behaviour [20], the motivation for suicidal ideation occurs when appraisals of defeat and humiliation combine with feelings of entrapment. Defeat is more likely to lead to entrapment when there are problem-solving difficulties, memory biases, and rumination. Defeat and entrapment are more likely to lead to suicidal ideation when there is a sense of thwarted belonging, burdensomeness, depleted resilience, and lack of social support. The patients with persecutory delusions show the presence of many elements of this model: marked negative-self beliefs and low psychological well-being (defeat); pessimism and lack of anticipation of pleasure (entrapment); worry (ruminative thinking); and they are typically single and unemployed, indicators of low social support. These factors could be targets in treatment.

There are a number of limitations to the study. Foremost, it is unknown how representative the group is of all patients with persecutory delusions seen in services. We note that the profile of the patients is similar to most other clinical reports of intervention tests for patients with positive symptoms of schizophrenia, but it is likely that filters would have acted in the study recruitment. Patients with the most severe suicide risk would not have engaged with a clinical trial, while engagement in a trial may have been more likely with raised emotional distress and therefore greater suicidal ideation. The patients were also in one part of the UK, with relatively low use of illicit drugs, limited diversity in ethnicity, and fewer living in substantial urban areas. It is also unknown from this study how rates of suicidal ideation in patients with persecutory delusions in the context of non-affective psychosis may differ from patients with other types of mental health disorders. In this exploratory study, with many conceptually-related variables, there was no adjustment of significance levels for multiple testing. The participant sample size was too small to test correlates of recent suicidal behaviours since too few had occurred. The sample size was suitable to test correlates of suicidal ideation, but the cross-sectional design prevents any inferences about the correlates being risk factors, causal contributors, secondary consequences, or simply the result of confounding variables. Different research designs are now needed to address issues of causality in this clinically important area.

## Declaration of Competing Interest

None reported.

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## References

[1] O'Connor RC, Nock MK. The psychology of suicidal behaviour. Lancet Psychiatry 2014;1:73–85.
[2] Klonsky ED, May AM, Saffer BY. Suicide, suicide attempts, and suicidal ideation. Annu Rev Clin Psychol 2016;12:307–30.
[3] Nock MK, Borges G, Bromet EJ, Alonso J, Angermeyer M, Beautrais A, et al. Cross-national prevalence and risk factors for suicidal ideation, plans and attempts. Br J Psychiatry 2008;192:98–105.
[4] Saha S, Chant D, McGrath J. A systematic review of mortality in schizophrenia: is the differential mortality gap worsening over time? Arch Gen Psychiatry 2007;64:1123–31.
[5] Hor K, Taylor M. Suicide and schizophrenia. J Psychopharmacol 2010;24:s81–90.
[6] Fazel S, Wolf A, Palm C, Lichtenstein P. Violent crime, suicide, and premature mortality in patients with schizophrenia and related disorders: a 38-year total population study in Sweden. Lancet Psychiatry 2014;1:44–54.
[7] Hubers A, Moaddine S, Peersmann S, Stijnen T, van Duijn E, van der Mast RC, et al. Suicidal ideation and subsequent completed suicide in both psychiatric and non-psychiatric populations: a meta-analysis. Epidemiol Psychiatr Sci 2018;27:186–98.
[8] Chapman C, Mullin K, Ryan C, Kuffel A, Nielssen O, Large M. Meta-analysis of the association between suicidal ideation and later suicide among patients with either a schizophrenia spectrum diagnosis or a mood disorder. Acta Psychiatr Scand 2015;131:162–73.
[9] Kontaxakis V, Havaki-Kontaxaki B, Margariti M, Stamouli S, Kollias C, Christodoulou G. Suicidal ideation in inpatients with acute schizophrenia. Can J Psychiatry 2004;49:476–9.
[10] Tarrier N, Barrowclough C, Andrews B, Gregg L. Risk of non-fatal suicide ideation and behaviour in recent onset schizophrenia—the influence of clinical, social, self-esteem and demographic factors. Soc Psychiatry Psychiatr Epidemiol 2004;39:927–37.
[11] Peralta V, Moreno-Izco L, Calvo-Barrena L, Cuesta M. The low- and higher-order factor structure of symptoms in patients with a first episode of psychosis. Schizophr Res 2013;147:116–24.
[12] Freeman D. Persecutory delusions: a cognitive perspective on understanding and treatment. Lancet Psychiatry 2016;3:685–92.
[13] Freeman D, Bradley J, Waite F, Sheaves B, DeWeever N, Bourke E, et al. Targeting recovery in persistent persecutory delusions: a proof of principle study of a new translational psychological treatment. Behav Cogn Psychother 2016;44:539–52.
[14] Fialko L, Freeman D, Bebbington PE, Kuipers E, Garety PA, Dunn G, et al. Understanding suicidal ideation in psychosis: findings from the Psychological Prevention of Relapse in Psychosis (PRP) trial. Acta Psychiatr Scand 2006;114:177–86.
[15] Freeman D, McManus S, Brugha T, Meltzer H, Jenkins R, Bebbington P. Concomitants of paranoia in the general population. Psychol Med 2011;41:923–36.
[16] Núñeza D, Fresnoa A, van Borkulo CD, Courtet P, Arias V, Garrido V, et al. Examining relationships between psychotic experiences and suicidal ideation in adolescents using a network approach. Schizophr Res 2018;201:54–61.
[17] Kjelby E, Sinkeviciute I, Gjestad R, Kroken RA, Løberg EM, Jørgensen HA, et al. Suicidality in schizophrenia spectrum disorders: the relationship to hallucinations and persecutory delusions. Eur Psychiatry 2015;30:830–6.
[18] Taylor PJ, Gooding PA, Wood AM, Johnson J, Pratt D, Tarrier N. Defeat and entrapment in schizophrenia: the relationship with suicidal ideation and positive psychotic symptoms. Psychiatry Res 2010;178:244–8.
[19] Williams M. Cry of pain: understanding suicide and the suicidal mind. London: Piatkus; 2014.
[20] O'Connor RC, Kirtley OJ. The integrated motivational-volitional model of suicidal behaviour. Philos Trans R Soc B 2018;373:20170268 https://doi.org/10.1098/rstb.2017.0268.
[21] Hawton K, van Heeringen K. Suicide. Lancet 2009;373:1372–81.
[22] Collett N, Pugh K, Waite F, Freeman D. Negative cognitions about the self in patients with persecutory delusions. Psychiatry Res 2016;239:79–84.
[23] Posner K, Brown G, Stanley B, Brent D, Yershova K, Oquendo M, et al. The Columbia-Suicide Severity Rating Scale. Am J Psychiatry 2011;168:1266–77.
[24] Freeman D, Waite F, Emsley R, Kingdon D, Davies L, Fitzpatrick R, et al. The efficacy of a new translational treatment for persecutory delusions: study protocol for a randomized controlled trial (the Feeling Safe Study). Trials 2016;17:134.
[25] Freeman D, Garety PA. Comments on the content of persecutory delusions: does the definition need clarification? Br J Clin Psychol 2000;39:407–14.
[26] United States Food and Drug Administration, United States Department of Health and Human Services (2012). Guidance for industry: suicidality: prospective assessment of occurrence in clinical trials, Draft Guidance. Revision 1. https://www.fda.gov/downloads/Drugs/Guidances/UCM225130.pdf
[27] Beck AT, Steer RA, Brown GK. BDI-II Manual. San Antonia: The Psychological Corporation; 1996.

[28] Haddock G, McCarron J, Tarrier N, Faragher FB. Scales to measure dimensions of hallucinations and delusions: the psychotic symptom rating scales (PSYRATS). Psychol Med 1999;29:879–89.
[29] Green C, Freeman D, Kuipers E, Bebbington P, Fowler D, Dunn G, et al. Measuring ideas of persecution and social reference. Psychol Med 2008;38:101–11.
[30] Bell V, Halligan PW, Ellis HD. The Cardiff Anomalous Perceptions Scale (CAPS). Schizophr Bull 2006;32:366–77.
[31] Forbes D, Alkemade N, Mitchell D, Elhai J, McHugh T, Bates G, et al. Utility of the Dimensions of Anger Reactions-5 (DAR-5) scale as a brief anger measure. Depress Anxiety 2014;31:166–73.
[32] Bastien CH, Vallieres A, Morin CM. Validation of the Insomnia Severity Index as an outcome measure for insomnia research. Sleep Med 2001;2:297–307.
[33] American Psychiatric Association (1994). Diagnostic and Statistical Manual of Mental Disorders. Fourth edition. American Psychiatric Association; Washington, DC.
[34] Marsden J, Gossop G, Stewart D, Best D, Farrell M, Lehmann P, et al. The Maudsley Addition Profile (MAP). Addiction 1998;93:1857–67.
[35] Fowler D, Freeman D, Smith B, Kuipers E, Bebbington P, Bashforth H, et al. The Brief Core Schema Scales (BCSS): psychometric properties and associations with paranoia and grandiosity in non-clinical and psychosis samples. Psychol Med 2006;36:749–59.
[36] Meyer TJ, Miller ML, Metzger RL, Borkovec TD. Development and validation of the Penn State Worry Questionnaire. Behav Res Ther 1990;28:487–95.
[37] Freeman D, Garety PA, Kuipers E. Persecutory delusions: developing the understanding of belief maintenance and emotional distress. Psychol Med 2001;31:1293–306.
[38] Tennant R, Hiller L, Fishwick R, Platt S, Joseph S, Weich S, et al. The Warwick-Edinburgh Mental Well-being Scale (WEMWBS): development and UK validation. Health Qual Life Outcomes 2007;5:63. https://doi.org/10.1186/1477-7525-5-63.
[39] Gard D, Gard M, Kring A, John O. Anticipatory and consummatory components of the experience of pleasure: a scale development study. J Res Pers 2006:1096–102.
[40] Wechsler D. Wechsler Adult Intelligence Scale. . 3rd ed.San Antonio, TX: The Psychological Corporation; 1997.
[41] Brooks R, Rabin R, Charro F, editors. The measurement and valuation of health status using EQ-5D: A European perspective. Dordrecht: Kluwer Academic Publishers; 2003.
[42] Jolley S, Garety PA, Ellett L, Kuipers E, Freeman D, Bebbington PE, et al. A validation of a new measure of activity in psychosis. Schizophr Res 2006;85:288–95.
[43] IBM. SPSS statistics version 22. Release 22.0.0. Armonk, NY: IBM Corporation; 2013.
[44] Perneger T. What's wrong with Bonferroni adjustments. Br Med J 1998;316:236–1238.
[45] Brown GK, Steer RA, Henriques GR, Beck AT. The internal struggle between the wish to die and the wish to live: a risk factor for suicide. Am J Psychiatry 2005;162:1977–9.