


# Religious delusions in Dutch older adults in treatment for psychosis: a follow-up study

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## ABSTRACT

**Objective:** The course over time of religious delusions (RDs) in late-life schizophrenia and psychotic depression may be relevant to know how long certain aspects of RDs may affect treatment. The present study examines (1) the 1-year follow-up of RDs and other prevalent delusions, (2) the association between RDs and the clinical course of psychotic depression and schizophrenia compared to those without RDs, and (3) associations of RDs and other prevalent delusions with “indicators of complexity” (e.g., suicidality, refusing medication).

**Design:** Prospective study (half year and 1-year follow-up combined).

**Setting:** Outpatients and inpatients in Geriatric Psychiatry Institution of Yulius, South-Holland, the Netherlands.

**Participants:** One hundred and thirty seven older adult patients, mean age 76.3 (s.d. 8.1).

**Intervention:** Natural follow-up study.

**Measurements:** Diagnostic interview measures included Schedules for Clinical Assessment in Neuropsychiatry (SCAN 2.1), positive psychosis items of the Community Assessment of Psychic Experiences-42 (CAPE), and the 20-item measures from the Centre for Epidemiologic Studies Depression Scale (CES-D).

**Results:** Although RDs in older adults decline in the clinical course of psychotic depression, the course is unfavorable compared to psychotic depression without RDs with regard to depressive symptom severity as measured by CES-D. No significant differences were noted in relation to clinical course of positive psychotic symptoms for both psychotic depression and schizophrenia. In schizophrenia, RDs persist more frequently compared to the most prevalent delusions. No significant difference was observed between patients with RDs compared to patients without RDs regarding indicators of clinical complexity.

**Conclusions:** RDs predicting a less favorable course over time in psychotic depression. In schizophrenia, RDs appears to be relatively pervasive.

**Key words** delusions, psychosis, longitudinal studies, psychogeriatrics, religion

## Introduction

In certain types of psychotic psychopathology, symptoms with religious themes, and religious delusions (RDs) in particular, belong to the classic manifestations. This may also be the case in a partly

secularized, plural society such as The Netherlands. Especially in the lives of older adults, religion often still plays an important role (Shaw *et al.*, 2016). Patients' religious background or other aspects of religiousness can affect the type and content of delusions. In a cross-sectional study based on the same sample as the present study, RDs were significantly more prevalent in (raised or current) strict Protestant's patients, especially in those with psychotic depression compared to nonaffiliated patients and mainline Protestant's patients. Therefore, it is

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likely that religion acts as a symptom-formation factor for psychotic symptoms in strict Protestant older adults (Noort *et al.*, 2020).

The course over time of RDs may be relevant to know how long certain aspects of RDs may affect or complicate the treatment, especially in schizophrenia and psychotic depression. As there is little research on the longitudinal course of RDs over time, it is not certain whether RDs are related to positive and negative prognostic consequences. For example, Connell *et al.* (2015) demonstrated in a schizophrenia sample of the Xhosa people of southern Africa (with 86% of the participants being affiliated) that 70% had RDs. Over a period of 6 months, the frequency of the RDs increased significantly, but the distress due to the RDs decreased significantly.

In psychoses, the question arises whether RDs are related to religious struggle (Pargament *et al.*, 2011) as may be apparent from higher scores on scales for “negative religious coping”. In their systematic review, Braam and Koenig (2019) demonstrated that religious struggle generally predicts an increase in depression. On the other hand, RDs may also reflect that the patient finds support from religious resources as a frame of reference. For example, De Berardis *et al.* (2020) demonstrated in young adults with a first episode of major depression with melancholic characteristics and a Roman Catholic faith (N = 94, mean age 25 years) that positive religious coping correlated negatively with the severity of depressive symptoms.

### **RDs and the clinical course of psychotic disorders**

RDs are common in major mental disorders, and the form and content of RDs have a significant impact on both diagnosis and management (Cook, 2015). In a sample of affective and nonaffective psychotic patients (N = 313, mean age = 42 years), Raja *et al.* (2000) demonstrated in patients with RDs a longer duration of untreated mental health problems. To date we have not found any publications on the course of psychotic depression in relation to RDs.

In a retrospective design with 193 adult patients with schizophrenia (mean age = 35 years), Siddle *et al.* (2002) demonstrated that patients with RDs had a significantly longer history of mental health problems compared to patients without RDs. Furthermore, Huang *et al.* (2011) demonstrated also a longer duration of untreated mental health problems in schizophrenia patients with RDs (N = 55, mean age = 34 years). Finally, Mohr *et al.* (2010) demonstrated that the presence of RDs (N = 38) was associated with more positive symptoms in schizophrenia patients, but no longer mean duration of illness.

### **Association of RDs with indicators of clinical complexity**

Need for admission, preference toward pharmacotherapy, suicidality, and deliberate self-harm can be seen as indicators of clinical complexity. In their systematic review, Jääskeläinen *et al.* (2017) demonstrated in psychotic depression no differences in the number of hospitalizations compared to patients with nonpsychotic depression. To date, no data have been found regarding RDs in psychotic depression. In schizophrenia, patients with RDs were hospitalized longer compared to patients with other types of delusions (Kaleda *et al.*, 2017). However, Mohr *et al.* (2010) demonstrated that patients with RDs had a shorter hospital stay than patients with other delusions.

Furthermore, RDs have been shown to be associated with lower preference toward psychiatric treatment (Huang *et al.*, 2011; Mohr *et al.*, 2010). Moreover, Caqueo-Urizara *et al.* (2015) demonstrated that patients with higher levels of magical-religious beliefs had a less favorable attitude toward pharmacotherapy. However, Raja *et al.* (2000) demonstrated that patients with RDs started their antipsychotic medication earlier than patients without RDs.

Regarding the relation between RDs and suicidality, Chouinard *et al.* (2019) described associations between RDs, visual hallucinations, delusions of control, erotomanic and jealousy delusions with a history of a suicide attempt, and catatonic behavior. In patients with delusions of guilt, cited for their strong relationship with RDs, 5.3 higher odds of a suicide attempt were demonstrated compared to patients without delusions of guilt (Gournellis *et al.*, 2019). Finally, several studies demonstrated associations between RDs and (serious) deliberate self-harm (Chauhan *et al.*, 2016, Moselhy *et al.*, 1995; Siddle *et al.*, 2002).

The aim of the present study is to obtain more insight into the course of RDs over time, both for late life affective and nonaffective psychotic disorders, their possible impact on treatment, and their association with indicators of clinical complexity. The following research questions are addressed:

1. What is the 1-year follow-up of RDs and the most common other types of delusions in psychotic depression and schizophrenia in older adults?
2. How is the association between RDs and the clinical course of psychotic disorders (affective or nonaffective) in older adults compared to psychotic disorders without RDs?
3. Are RDs and the most prevalent other types of delusions more often associated with indicators of clinical complexity (e.g., admission, suicidality) compared to psychotic disorders without these delusions?

## Method

### Subjects

The current study was conducted from 2005 to 2011 at the Geriatric Psychiatry Department of Yulius, a regional mental health care facility serving the Gorinchem and Dordrecht region in the Netherlands. Clinicians in the department recruited inpatients and outpatients, aged 65 years and older, when clinically diagnosed according to the Diagnostic and Statistical Manual 4<sup>th</sup> edition (American Psychiatric Association 2000): schizophrenia (295), schizophreniform disorder (295.40), schizoaffective disorder (295.70), delusional disorder (297.1), brief psychotic disorder (298.8), psychotic disorder not otherwise specified (298.9), severe depressive disorder with psychotic features (296.x4), and severe bipolar disorder manic, mixed or depressed, with psychotic features (296.44, 296.54, 296.64 and 296.89). Classification according to DSM is part of the regular mental health care practice in The Netherlands. The patients included in the current study also took part in the systematic diagnostic interview (SCAN 2.1, see below), which was to provide the diagnostic information for the aims of the study.

The exclusion criteria were psychotic disorders due to a general somatic condition, delirium, dementia or probable dementia and substance-related disorders, personality disorders as primary reason of concern, and psychotic experiences as part of dissociative symptomatology.

The study was approved by the Medical Ethical Committee of the Vrije Universiteit Medical Centre Amsterdam. Written informed consent was obtained from all participating patients.

If a score of 17 points or lower on the Standardized Mini-Mental State Examination (S-MMSE) (Molloy and Standish, 1997, Dutch translation by Folstein *et al.*, 1975; Kok and Verhey, 2002) was observed during the assessment, a further work-up was used to detect the underlying causes of cognitive dysfunction. In the event of dementia or probable dementia, the patient was excluded from the study and did not take part in the diagnostic interview.

At baseline 155 patients were included. One hundred and twenty of them participated in both follow-up measurements; twelve of the baseline participated in T1 only and five in T2 only. In total, a data set of 137 patients remained. The baseline measurements with at least one follow-up measurement have been pooled. Reasons for drop-out were suicide (N = 1), natural death (N = 4), Mini Mental State Examination (MMSE) scores <18 points (N = 4), aphasia after stroke (N = 1), relocation (N = 1), and refusal of further participation (N = 7).

### Procedures

A detailed description of the procedures has been described by Noort *et al.* (2020). In summary, at the start of the study, all the patients who were already under treatment and fulfilled the inclusion criteria could be included (N = 77). In the following 5 years, additional patients who were newly referred to the Geriatric Psychiatry Department could be included (N = 168). After informed consent was obtained, psychotic phenomena (and RDs in particular) were assessed using the Schedules for Clinical Assessment in Neuropsychiatry (SCAN 2.1) (Giel and Nienhuis, 2001). The SCAN was developed by the WHO and replaced the Present State Examination (Wing *et al.*, 1989). Ten sections were administered: section 1 (start of the interview), sections 3, 6, 7, and 8 (depressed mood), section 10 (manic mood), and sections 17–20 (psychotic symptoms). The computerized algorithm of the SCAN 2.1 (WHO-SCAN for Windows, Dutch full version v.1.0.4.6, Harcourt, Lisse, The Netherlands) provided DSM-IV diagnoses.

The SCAN interview applies clear criteria to ascertain a delusion and requires that the delusional belief: (1) should be clearly recorded in the participant's own words; (2) is fundamental and irresistible, subjective conviction; and (3) is not – or only briefly – susceptible to change based on experience or evidence to the contrary, in other words, the belief is uncorrectable; and (4) is impossible, implausible, or false. After verifying the presence of all possible delusions, the patient was asked about religious statements: What is the explanation for these/your experiences? Is there a religious explanation for it? However, beliefs that are shared and fully explained by certain religious (or political or other social) groups should not be considered as delusional. When possible RDs were identified with the SCAN interview, the interviewer made detailed notes about the contents of the (probably delusional) conviction or experiences. Afterward, when elaborating on the entire interview, the researcher (the second researcher in dialogue with the first author who is familiar with orthodox Protestant convictions) evaluated whether the convictions or experiences could be entirely understood as belonging to strict orthodox convictions or (for other denominations) as belonging to normal, non-pathological spiritual experiences. Spiritual experiences such as “oceanic feelings” or “feelings of unity” have not been interpreted psychiatrically. Occult influences, telepathy, etc. are counted in the SCAN as “paranormal.”

Half a year (T1) and 1 year (T2) after the baseline measurements, the S-MMSE was administered to

adequately screen cognitive functioning. Furthermore, the (treatment) course of the psychotic phenomena was determined with the introductory section questions of the SCAN 2.1: section 17 (hallucinations), section 18 (subjective disorder of thinking and taking over of the will), and section 19 (delusions). The (treatment) course of the mood complaints was determined with the introductory questions of the depressed mood sections and the manic mood section (in patients with a bipolar disorder) of the SCAN 2.1. These questions were administered together with the 20 positive psychosis items of the Community Assessment of Psychic Experiences-42 (CAPE) (Stefanis *et al.*, 2002) and the Centre for Epidemiologic Studies Depression Scale (CES-D) (Beekman *et al.*, 1994; Radloff, 1977).

The follow-up scores of *delusions* were manually recoded (see appendix). In summary, the symptom or state in the follow-up scores were recoded in 0 = the symptom or state is not present at baseline or at follow-up; 1 = remission of the symptom or state at T1 or T2; 2 = the symptom or state relapsed at T1 or T2 or went into partial remission at T1 or T2; and 3 = the symptom or state persists in the last measurement. The follow-up measurements without any follow-up measurement were recoded as “missing” (= no longitudinal course or missing at T1 and T2).

The CAPE-42 is a validated self-report inventory measured experiences of positive, negative, and depressive features of psychosis. In the current study, only the positive dimension frequency scores have been assessed. Response categories range from 1 to 4 (never-sometimes-often-nearly-always), with internal consistency of Cronbach  $\alpha = 0.66$ . With respect to the follow-up measurements, the largest difference between the baseline measurement and the two follow-up measurements was applied as a measure of change over time.

The CES-D (Radloff, 1977) is a 20-items questionnaire constructed to measure depressive symptoms. The response categories ranged from 0 (“rarely or none of the time”) to 3 (“most of or all the time”), yielding a score range of 0–60 (Cronbach  $\alpha = 0.83$ ). A CES-D score of 16 or higher has generally been used as indicative for clinically relevant depressive symptoms including major depression (Beekman *et al.*, 1997). Another advantage is that the overlap with symptoms of physical illness is limited (Berkman *et al.*, 1986). With respect to the follow-up measurements, the largest difference between the baseline score and the two follow-up scores was applied as a measure of change over time.

The follow-up measurements of the *diagnosis* were manually recoded like the delusions as explained above (and see for more detail the appendix). For this, the diagnostic categories schizophrenia and psychotic depression were used, as both

pertain to more specifically delineated syndromes because of a chronic or at least intermittent course and a considerable burden on the patient and a need for care. The number of patients with other conditions (e.g., delusional disorder and psychotic disorder not otherwise specified) was low.

Regarding *indicators of clinical complexity* that are likely to be intertwined with the clinical course, the following characteristics were derived from each patient’s clinical file at baseline and T1 and T2: being admitted to a clinical ward (yes/no), refusing medication ( $\geq 1$  week), deliberate self-harm (yes/no), suicide attempts (yes/no), and successful suicide. The presence of an indicator was scored during the course of the study: presence of the indicator at baseline, half year-follow-up or 1-year follow-up was scored as 1, entire absence (over time) as 0. In case of missing data in the file, these were checked with the clinician. Furthermore, lack of clinical insight was scored on SCAN item 19.039 (conviction) after the interview (0 = doubt or no delusion, 1 = generally convinced, 2 = uncorrectable belief) was recoded as 1 = uncorrectable belief or 0 = others.

With respect to *religious affiliation*, four categories were used corresponding with the main Christian traditions in the Netherlands, i.e., mainline Protestant, strict Protestant, Roman Catholic, and Evangelical, see for details the appendix. In addition, a fifth category was used for the nonaffiliated. *Religious coping* was assessed using an 11-item Dutch version of the Brief Religious Coping Scale (RCOPE) instead of the 14-item version, which seemed to be slightly less culture-sensitive (Pargament *et al.*, 2000; Braam *et al.*, 2008). The *positive* religious coping scale included five items in our study (concise content: my life as part of a higher, all-encompassing whole; works together with God as partners; looks to God for strength, support, and guidance; tries to find lessons from God; confesses sins. Cronbach’s  $\alpha = 0.81$ ). The *negative* religious coping scale has four items (concise content: wonders whether one has been abandoned by God; questions whether God exists; expresses anger at God; doubts God’s love. Cronbach’s  $\alpha = 0.53$  is low.) In fact, the scale is a summation of negative cognitions without common characteristics. The response categories were 1 = not at all, 2 = somewhat, 3 = quite a bit, 4 = a great deal, and were recoded as 0 = never or somewhat or 1 = others. One item on the negative coping subscale pertains to punishment appraisal (“I feel stressful situations are God’s way of punishing me for my sins or lack of spirituality”). As in a pilot study (Braam *et al.*, 2008), this item did not have an impact on the dimension of negative coping. It had a modest impact on the positive coping scale and was not used further in our study.

The demographic variables at baseline included age, gender, marital status, and years of education. Marital status was recoded as 1 = married or living together or 0 = widowed, living separately, legally divorced, or never married and not living together (single).

### Data analysis

Distributions are described for the demographic characteristics at baseline. As a point of departure, the present sample consisted of patients belonging to several religious traditions. Therefore, the distribution of RDs across the denominations in the clinical course was investigated, using crosstabulation and Fisher's exact test. Furthermore, scores on the positive RCOPE or the negative RCOPE, as regard to RDs (never RDs, remission, or persistent), one way ANOVA analyses were performed.

Regarding the first research question, percentages of the three most common delusions at baseline (see for a full description at baseline Noort *et al.*, 2018) and follow-up were described, and the decrease calculated using the McNemar's test. The analysis was repeated for the subgroups with psychotic depression (at baseline) and with schizophrenia (at baseline). Regarding the second research question, RDs (at baseline, present versus absent) in relation to the clinical course of psychoses were investigated using change scores (baseline score subtracted from highest follow-up score) on the CAPE-frequency subscale, using regression analysis, with adjustment for baseline CAPE frequency scores. Furthermore, RDs in relation to the clinical course of depression were investigated using change scores (baseline score subtracted from highest follow-up score) on the CES-D, using regression analysis, with adjustment for baseline CES-D scores. Furthermore, RDs (at baseline, present versus absent) in relation to diagnosis in remission versus non-remission were investigated using logistic regression analysis. Regarding the third research question whether RDs and the more prevalent delusions would be related to indicators of clinical complexity (admission, refusing medication, suicide attempt / successful suicide, lack of clinical insight), cross-tabulations, and Chi-square statistics were applied and Fisher's exact test in case the numbers were low.

Statistical analyses were conducted using IBM SPSS Statistics (version 21, SPSS Inc., Chicago, IL, USA).

## Results

### Characteristics of the sample

The characteristics of the sample at follow-up are shown in Table 1. In short, most of the respondents

**Table 1.** Demographics and clinical characteristics of the sample at baseline (N = 137)

	N (%)
Sex: female	98 (72)
Age (mean, s.d.) <sup>a</sup>	76.3 years (s.d. 8.1)
Marital state	
Widowed	56 (41)
Single (divorced/never married)	38 (28)
Married/cohabiting	43 (31)
Education (mean, s.d.) <sup>b</sup>	8.6 years (s.d. 2.6)
Religious affiliation	
Nonaffiliated	41 (30)
Strict Protestant <sup>c</sup>	27 (20)
Moderate Protestant	46 (34)
Roman Catholic	12 (9)
Evangelic	8 (6)
Setting	
Outpatient	76 (56)
Inpatient	58 (42)
Main diagnosis	
Schizophrenia <sup>d</sup>	49 (37)
Delusional Disorder	26 (19)
Psychotic Disorder NAO <sup>e</sup>	14 (10)
Depressive Disorder with psychotic features	44 (33)
Bipolar Disorder, Manic episode	1 (1)
CAPE frequency scores <sup>f</sup> range -1.3 to 1.1 (mean, s.d.)	-0.2 (0.3)
CES-D scores <sup>g</sup> range 0-40 (mean, s.d.)	20.4 (8.3)
RCOPE_POS <sup>h</sup> range 0-14 (mean, s.d.)	6.3 (4.5)
RCOPE_NEG <sup>i</sup> range 0-9 (mean, s.d.)	2.7 (2.5)

<sup>a</sup>Age range 64-94 years.

<sup>b</sup>Education range 3-18 years.

<sup>c</sup>Including Pietistic Reformed denominations, reformed denominations (devout), dogmatic and reformed denominations (non-devout).

<sup>d</sup>Including schizophreniform disorder and schizoaffective disorder.

<sup>e</sup>NAO = Not Otherwise Specified.

<sup>f</sup>CAPE = Community Assessment of Psychic Experiences-42, N = 135.

<sup>g</sup>CES-D = Centre for Epidemiological Studies Depression Scale, N = 135.

<sup>h</sup>RCOPE\_POS = the positive religious coping scale, N = 85.

<sup>i</sup>RCOPE\_NEG = the Negative religious coping scale, N = 86.

were female (72%), the mean age was 76.3 years (s.d. 8.1), a third lived together (married or cohabiting), and 56% were outpatients. As to patients' religious affiliation, there was considerable heterogeneity with one-third mainline Protestant, one-third non-affiliated, one-fifth strict Protestant, and few Roman Catholics or Evangelicals. Patients with RDs applied statistically significantly *more* positive religious coping and *less* negative religious coping compared to patients without RDs, regardless of remission or nonremission of RDs, see Table 2, bottom rows.

**Table 2.** Associations between demographics and clinical characteristics with RDs in remission or persistent RDs in a follow-up sample, results from bivariate Analysis (N = 137)

	No RDs, %	REMISSION, %	PERSISTENT, %	$\chi^2$ (DF = 2)	P
Total sample (with follow-up)	66.4	19.7	13.9		
Sex: female	69.4	20.4	10.2	3.9	0.144
Marital state <sup>a</sup>	62.8	25.6	11.6	1.4	0.485
Denomination					
Non-affiliated	79.1	14.0	7.0		
Strict Protestant <sup>c</sup>	40.7	44.4	14.8		
Moderate Protestant	74.5	6.4	19.1		
Roman Catholic	41.7	41.7	16.7		
Evangelical	75.0	12.5	12.5	23.4 <sup>b</sup>	<0.001
Admission	65.6	24.6	9.8	2.6	0.268
Schizophrenia <sup>d</sup>	59.2	14.3	26.5		
Psychotic depression	56.5	32.6	10.9	6.5	<b>0.038</b>

	No RDs	REMISSION	PERSISTENT	F	P
	MEAN (S.D.)	MEAN (S.D.)	MEAN (S.D.)		
Age (years)	77.1 (8.0)	76.2 (8.7)	72.5 (7.4)	2.6	0.081
Education (years)	8.6 (2.6)	8.2 (2.9)	9.3 (2.2)	0.9	0.397
RCOPE_POS <sup>e</sup>	5.3 (4.4)	9.2 (3.5)	8.2 (4.7)	6.2	<b>0.003</b>
RCOPE_NEG <sup>f</sup>	3.1 (2.6)	1.7 (1.8)	1.7 (1.9)	3.3	<b>0.043</b>

<sup>a</sup>Marital state = married/cohabiting vs. rest.

<sup>b</sup>Fisher's exact test (df = 8).

<sup>c</sup>including Pietistic Reformed, Reformed (devout), Dogmatic and Reformed (non-devout).

<sup>d</sup>including Schizophreniform disorder and schizoaffective disorder.

<sup>e</sup>RCOPE\_POS = questions about seeking support and experiencing faith in troubled times.

<sup>f</sup>RCOPE\_NEG = questions about interpretations of deserved punishment or sense of being abandoned by God.

Significant results ( $p < .05$ ) are printed in bold.

RDs were more common among patients with a strict Protestant or Roman Catholic background (see Noort *et al.*, 2020 for further discussion). Rates of remission of the RDs were high in those groups as well, see Table 2 (see middle rows). Assessed on main diagnosis level, there were no differences in psychotic depression and schizophrenia (results on request).

### One-year course of RDs and other delusions in psychosis

With respect to the first research question, at 1-year follow-up rates of persecutory delusions dropped from 67% to 31% (McNemar's  $\chi^2 = 39.7$ ,  $p < .001$ ), rates of RDs dropped from 29% to 14% (McNemar's  $\chi^2 = 12.1$ ,  $p < .001$ ), and rates of delusions of guilt dropped most from 28% to 4% (McNemar's  $\chi^2 = 27.7$ ,  $p < .001$ ). In terms of disorder, as shown in Figure 1, left-hand panel, there is a marked decrease in all three most common delusions (for baseline data, see Noort *et al.*, 2018) in psychotic depression. The decrease of delusions in schizophrenia is less remarkable as is shown in the right-hand panel of Figure 1. The most common types of delusions tend to persist over time. The

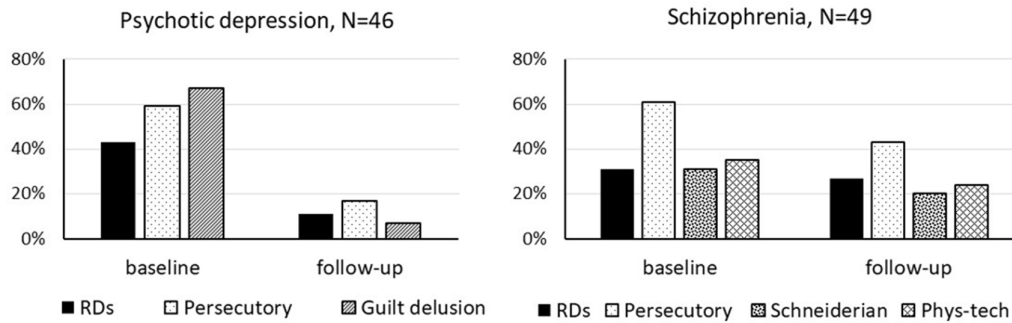
persistence of the delusions (lower panel of Figure 1) was the most prominent, at 87% for RDs.

### RDs in relation to clinical course of psychosis

With respect to the second research question, the presence of RDs at baseline predicted no unfavorable course over time as reflected by positive psychotic symptoms (assessed with the CAPE difference scores, adjusted for baseline CAPE scores) in psychotic depression nor in schizophrenia, see Table 3b top rows.

Furthermore, the presence of RDs at baseline predicted a less favorable course over time as reflected by depressive symptoms (assessed with the CES-D difference scores, adjusted for baseline CES-D scores) in psychotic depression but not in schizophrenia, see Table 3b middle rows.

Finally, regarding persistence of diagnosis, the odds ratio (OR) for persistence of psychotic depression as predicted by RDs at baseline amounted to 3.33 but did not reach statistical significance ( $p = .062$ ). The OR of the persistence of schizophrenia, as predicted by RDs at baseline amounted to 1.44, was not a statistically significant difference.



**Figure 1.** Most common types of delusions in psychotic depression and schizophrenia at baseline and at follow-up. RD = Religious delusions, Schneiderian = Schneiderian delusions, Persecutory = Persecutory delusions, Physical-technical = Physical-technical delusions.

### Associations with indicators of clinical complexity

Regarding the third research question, no statistically significant difference was observed between patients with RDs compared to patients without RDs regarding admission, refusing medication, suicide attempts, or lack of clinical insight, see Table 4, left-hand panel. The same applies to the persecutory delusion (data do not shown).

Regarding delusions of guilt, patients with delusions of guilt were admitted more frequently and committed suicide attempts more frequently compared to patients without delusions of guilt (“DGs” in Table 4, middle panel), a statistically significant difference. Furthermore, patients with delusions of guilt were less likely to refuse medication, a statistically significant difference compared to patients without delusions of guilt.

Furthermore, a total of seven patients had attempted suicide during the course of the study, six of them had a delusion of guilt. Moreover, three patients with RDs in combination with delusions of guilt had attempted suicide, see Table 4, right-hand panel.

Finally, the only patient who deliberately harmed herself (pinching and scratching) had RDs and delusions of guilt. The only successful suicide was committed by a patient with RDs (without delusions of guilt) and a psychotic depression after a previous failed attempt.

### Discussion

The present study aimed to describe (1) the 1-year follow-up of RDs and the most common other types of delusions in psychotic depression and schizophrenia in older adults, (2) the association between RDs and the clinical course of psychotic depression and schizophrenia, and (3) the association between RDs, the most common other prevalent delusions and

indicators of clinical complexity (e.g., suicidality, refusing medication). As a point of departure, the present sample consisted of older patients belonging to several religious traditions. As may have been expected, patients with RDs applied more positive religious coping compared to patients without RDs regardless of remission or non-remission of RDs. Positive religious coping seems to be an expression of faith and could help to reduce anxiety levels and even may attenuate the delusion conviction levels (Mohr *et al.*, 2010). As previously established, RDs were significantly more prevalent in patients with a strict Protestant background and religion is likely to act as a symptom-formation factor for psychotic symptoms in these patients (Noort *et al.*, 2020). Similarly, RDs in remission were significantly more prevalent in strict Protestant patients.

In turn, patients with RDs reported significantly lower levels of negative religious coping (religious struggle) irrespective of their state of remission or nonremission. When patients have more severe symptomatology, they can start looking for other resources such as spirituality or religion. For example, one strict protestant patient with a psychotic depression said that she was being challenged by the devil because of sins committed in the past. God had abandoned her, so she would better off dead. Once recovered, she said that she had wanted to drown herself, but God had retained her from it.

As to the first research question, in psychotic depression the most common types of delusions (including RDs, but particularly also delusions of guilt) showed a clear decline over the 1-year follow-up period. Delusions have been reported to be remarkable persistent (Corlett *et al.*, 2009) and until recently psychotic depressions were often insufficiently recognized and therefore an undertreated psychotic disorder (Rothschild, 2013; Vermeulen *et al.*, 2019). However, the current results demonstrate that, once in treatment, older adults with psychotic depression show a decrease in the most common delusions.

**Table 3.** (a) Most prevalent types of delusions in the baseline and follow-up sample, half a year (N = 137) and 1 year after baseline (N = 125). (b) Logistic regression for clinical course of religious delusions in psychotic older adults with psychotic depression and schizophrenia, baseline compared to follow-up scores at 6 months and 1 year after baseline combined

(A) MOST PREVALENT TYPES OF DELUSIONS IN THE BASELINE AND FOLLOW-UP SAMPLE, HALF A YEAR (N = 137) AND ONE YEAR AFTER BASELINE (N = 125)

TYPE OF DELUSION (N)	PSYCHOTIC DEPRESSION				SCHIZOPHRENIA		
	BASELINE SAMPLE (N = 46)	SIX MONTHS AFTER BASELINE (N = 44)	ONE YEAR AFTER BASELINE (N = 41)	BASELINE SAMPLE (N = 49)	SIX MONTHS AFTER BASELINE (N = 47)	ONE YEAR AFTER BASELINE (N = 47)	
		FOLLOW-UP SAMPLE	FOLLOW-UP SAMPLE		FOLLOW-UP SAMPLE	FOLLOW-UP SAMPLE	
Persecutory	27	10	7	30	20	18	
Grandeur	2	0	0	10	6	6	
Religious	20	6	2	15	10	11	
Guilt	31	6	1	3	1	0	
Schneider	11	3	2	15	4	9	
Physical/technical	3	1	1	17	8	11	

(B) LOGISTIC REGRESSION FOR CLINICAL COURSE OF RELIGIOUS DELUSIONS IN PSYCHOTIC OLDER ADULTS WITH PSYCHOTIC DEPRESSION AND SCHIZOPHRENIA, BASELINE COMPARED TO FOLLOW-UP SCORES AT 6 MONTHS AND ONE YEAR AFTER BASELINE COMBINED

	PSYCHOTIC DEPRESSION				SCHIZOPHRENIA			
	B	SE	$\beta$	P	B	SE	$\beta$	P
<i>CAPE frequency subscale difference scores<sup>a</sup></i>								
CAPE baseline	-0.88	0.11	-0.80	<b>&lt;0.001</b>	-0.70	0.16	-0.58	<b>&lt;0.001</b>
Religious delusion	0.02	0.06	0.04	0.698	0.07	0.12	0.07	0.592
<i>CES-D difference scores<sup>b</sup></i>								
CES-D baseline	-1.08	0.15	-0.72	<b>&lt;0.001</b>	-1.12	0.17	-0.72	<b>&lt;0.001</b>
Religious delusion	4.17	1.77	0.23	<b>0.023</b>	3.21	2.62	0.13	0.227
<i>Diagnosis in remission versus non-remission</i>								
Religious delusion	1.20	0.65	3.5 <sup>c</sup>	0.062	0.37	0.75	0.2 <sup>d</sup>	0.628

<sup>a</sup>Based on Community Assessment of Psychic Experiences-42 (CAPE-42) frequency subscale, maximum differences scores at baseline and at follow-up; N = 137.<sup>b</sup>Based on Center for Epidemiological Studies Depression Scale (CES-D) maximum difference scores between baselines and at follow-up (T1 or T2).<sup>c</sup>Wald score with OR 3.33 and 95% C.I. (0.94–11.81).<sup>d</sup>Wald score, OR 1.44 and 95% C.I. (0.33–6.31).Significant results ( $p < .05$ ) are printed in bold.

In schizophrenia, the course of the four most common types of delusions seems to be considerably more persistent. This is in line with Connell *et al.* (2015) reporting that persistent positive symptoms, despite treatment, are common in patients with schizophrenia. In the present study, the most persistent course (87%) pertained to RDs. It can be assumed that religion could play a role in the process of giving meaning, or that RDs provide certain existential value.

As to the second research question, the clinical course of psychosis with RDs in older adults tend to be less favorable. The burden of depressive symptoms decreased significantly less for depressed patients with RDs as compared to patients without RDs. As far as we could verify, no data are available on this from other research. Replication studies are therefore required. Nevertheless, presence of RDs did not predict the course of schizophrenia. RDs in schizophrenia persistent probably related to either



**Table 4.** Indicators of clinical complexity of the sample for older patients during the course of the study: with and without religious delusions, delusions of guilt or religious delusions in combination with delusions of guilt (N = 137)

	<i>RDs</i>					<i>DGs</i>				<i>RDs COMBINED WITH DGs</i>			
	ALL N (%)	WITH RDs N (%)	WITHOUT RDs N (%)	$\chi^2$ (DF = 2)	<i>P</i>	WITH DGs N (%)	WITHOUT DGs N (%)	$\chi^2$ (DF = 2)	<i>P</i>	BOTH RDs AND DGs N (%)	WITH OTHER DELUSIONS N (%)	$\chi^2$ (DF = 2)	<i>P</i>
Admission	78 (56.9)	25 (62.5)	53 (54.6)	1.5	0.481	28 (73.7)	50 (50.5)	6.8	<b>0.033</b>	12 (66.7)	66 (55.5)	1.4 <sup>b</sup>	0.485
Refusing medication <sup>a</sup>	40 (29.2)	10 (25.0)	30 (30.9)	3.9 <sup>b</sup>	0.142	5 (13.2)	35 (35.3)	6.4 <sup>b</sup>	<b>0.044</b>	4 (22.2)	36 (30.3)	0.8 <sup>b</sup>	0.711
Suicide attempts	7 (5.1)	3 (7.5)	4 (4.1)	0.7 <sup>b</sup>	0.416	6 (15.8)	1 (1.0)	12.4 <sup>b</sup>	<b>0.002</b>	3 (16.7)	4 (3.4)	5.7 <sup>b</sup>	<b>0.048</b>
Lack of clinical insight <sup>c</sup>	79 (57.7)	25 (55.0)	57 (58.8)	0.6	0.727	14 (36.8)	65 (65.7)	10.0 <sup>b</sup>	<b>0.004</b>	10 (55.6)	69 (58.0)	0.7 <sup>b</sup>	0.830

RDs = Religious delusions; DGs = Delusions of guilt.

<sup>a</sup>Refusing medication 1 week or longer.

<sup>b</sup>Fisher's exact test.

<sup>c</sup>Lack of insight, un-correctable convicted, df = 3.

Significant results ( $p < .05$ ) are printed in bold.

symptom formation due to religious socialization or to religious coping, to oppose a tendency of self-loss, and to aim to try maintaining a certain level of personal dignity under the ongoing burden of a psychotic disorder (Rokeach, 1964, p 331).

As to the third research question, during the 1-year follow-up, patients with RDs had no higher rates of admission and did not more often refuse medication. One study by Mohr and colleagues (2010) showed 21% admission among patients with RDs, but the sample, consisting of younger adults with schizophrenia, differed from the present sample. Regarding refusing medication, Raja et al. (2000) described higher levels of compliance with medication in older adult patients with RDs.

Suicidal behaviors occurred in only 5% of the present sample. Therefore, no significant evidence could be demonstrated for RDs being associated with these behaviors. However, in the present study, one patient with a psychotic depression and RDs committed suicide after a previous failed attempt. In the literature, there are (mostly older) case reports on deliberate self-harm in patients with RDs (Field and Waldfogel, 1995; Moselhy et al., 1995; Siddle et al., 2002). In a recent review, 16 patients of self-mutilation were inspired by biblical texts (Schwerkoske et al., 2012). All patients in the review exhibited (some) signs of psychosis at the time of their injury, with the diagnosis schizophrenia, substance-induced psychosis, and psychotic depression. In the present data, the only patient with deliberate self-harm (pinching and scratching herself) had RDs and delusions of guilt. This patient with a schizophrenic disorder heard voices that said she deserved punishment. She told about her bad marriage and that this would have been entirely her own fault, also because she was a lesbian. She indicated that the devil was in her head. She was convinced that people wanted to crucify her. The patient had also stood at the window several times, about to jump, convinced she deserved to die, and asked nurses to push her.

As in other studies (e.g., Chouinard et al., 2019; Gournellis et al., 2019), delusions of guilt, frequently present in patients with psychotic depression, showed a clear association with suicidal behavior. Furthermore, Gournellis described that the mental state of psychotic depressed patients is chaotic, as they are impaired in executive functions, have problem-solving problems and fail to think logically. It is conceivable that delusions of guilt, and perhaps the thought of deserved punishment, make patients vulnerable to attempting suicide. One may hypothesize that people with delusions of guilt may even come to earlier suicidal attempts when their self-destructive convictions bear a religiously inspired justification.

Finally, although the evidence about the delusions of guilt is slightly beyond the research questions on RDs, the data are more striking. Psychotic patients with delusions of guilt were significantly more likely to be admitted, were less likely to refuse their medications, and had more clinical insight compared to patients with other types of delusions. Data from the literature for comparison have not been found to date. However, the clinical experience is that delusions of guilt are pervasive and make great demands on the support system which may lead to more frequent admission. Clinical insight in patients with delusions of guilt was significantly better and refusal of medication significantly low compared to patients without delusions of guilt, which is in line with Lincoln et al. (2016), demonstrating that one of the most prominent reasons for refusal of medication is lack of clinical insight.

One limitation of our study is that the SCAN does not specifically identify nihilistic delusions. It thus remains uncertain whether delusions of guilt and RDs always cover problematic nihilistic convictions pertaining to negation of the self in so far as they are not covered by convictions of worthlessness, perishing, or decay. Another limitation is the relatively low number of participants in the follow-up measurements. However, the percentage of participants per follow-up moment was high, especially for this age category.

## Conclusions

In older adult patients with RDs, positive religious coping appears to be an important resource to reduce anxiety as well as conviction levels. Although RDs decline in the clinical course of psychotic depression, the course of the depression is unfavorable compared to psychotic depression without RDs. In schizophrenia, the course of RDs seems to be more persistent compared to the other most common delusions. Disease factors (previous episodes, severity at baseline), religious socialization (with strict Protestant convictions e.g., about guilt), and personal factors (e.g., hereditary factors) could explain this result. RDs are not associated with indicators of clinical complexity compared to patients without RDs, although possible with suicidality for those with RDs and delusions of guilt.

Based on the current data and previous research (Gournellis et al., 2019), adequate psychiatric diagnosis and prompt treatment of older adults with delusions of guilt and psychosis are indicated. It is important for mental health professionals, especially the predominantly secular professionals in the Netherlands, to recognize and address religious themes.

## Conflict of interest

None.

## Description of authors' roles

A. Beekman designed the study and supervised the statistical design of the study. A. Braam supervised the data collection, was responsible for the statistical design of the study, carrying out the statistical analysis, and assisted with writing the paper. J. Koolen read the manuscript carefully. A. Noort collected the data and wrote the paper.

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## Appendix

The follow-up scores of the *delusions* were manually recoded from 0-0-0 (no delusion at baseline, no delusion at 6 months after baseline (T1), no delusion 1 year after baseline (T2)), or 0-0-missing, or 0-missing-0, to 0 (= no delusion present, with the possibility of a missing at T1 or T2). Furthermore, the follow-up scores 1-0-0 (1 = the delusion is present, absent at T1 and T2), or 1-1-0, or 1-missing-0, or 1-0-missing, was recoded to 1 (= remission at T1 or T2). The follow-up scores 1-missing-missing, or 0-missing-missing, was recoded in 99 (= no longitudinal course or missing at T1 and T2). All other follow-up scores were recoded to 2 (= no complete remission).

Regarding the follow-up measurements of the *diagnosis* (schizophrenia, psychotic depression, delusional disorder, bipolar disorder, psychotic disorder not otherwise specified, and severe bipolar disorder manic, mixed or depressed, with psychotic features) 1-0-0 (1 = the disorder is present at baseline and at T1 and T2 disappeared), or 1-1-0, or 1-missing-0, or 1-0-missing, were recoded in score 1

(= remission). In addition, when the diagnosis of schizophrenia, psychotic depression or manic psychosis changed into a delusional disorder or a psychotic disorder not otherwise specified in a follow-up measurement, it was considered as a partial remission. In one patient the follow-up score 1-partial remission-0, were recoded in score 1 (= remission). Furthermore, the follow-up score 1-missing-missing, or 0-missing-missing, was recoded in 99 (= no longitudinal course or missing at T1 and T2). All other scores were recoded in score 2 (= no complete remission).

Regarding religiousness items were used for religious affiliation. Four categories were used corresponding with the main Christian traditions in the Netherlands, i.e., mainline Protestant (Dutch Reformed or Liberal), dogmatic/pietistic Protestant or strict Protestant such as Pietistic Reformed or other Reformed (devout) denominations, Roman Catholic and Evangelical, e.g., Pentecostal. In addition, there was the category of non-affiliations. The patients were asked which church they belonged to and which church they were raised in.