Anxiety Symptoms in Psychotic Disorders: Results from the Second Australian National Mental Health Survey

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Abstract

Background: The prevalence of anxiety symptoms among Australians with psychotic disorders was examined as part of the Survey of High Impact Psychosis (SHIP). **Methods:** A two-phase design was used. Of 7,955 people who were screened positive for psychosis and eligible, there were 1,825 participants (18–34 years and 35–64 years) interviewed. Data were collected on symptomatology, substance use, cognitive ability, functioning, disability, physical health, mental health service utilization, medication use, education, employment and housing. Anxiety symptomatology was divided into generalized anxiety, panic, phobic, social anxiety and obsessive-compulsive symptoms. **Results:** The most common *ICD-10* diagnoses were schizophrenia or schizoaffective disorder (63.0%) and bipolar (mania) disorder (17.5%). Overall, 59.8% (n=1,092) of participants reported experiencing anxiety symptoms in the previous twelve months. Female gender was highly associated with all domains of anxiety. Smoking was significantly associated with all domains of anxiety, except generalized anxiety. The presence of any depressive symptoms in the previous twelve months was significantly associated with all anxiety symptoms. Medication side effects were associated with phobic and obsessive-compulsive symptoms. Social dysfunction was associated with social anxiety, and less so for obsessive-compulsive symptoms. **Conclusions:** Anxiety symptoms are common in people with psychotic disorders. Appropriate screening and treatment should be a clinical priority.

Key Words: Anxiety, Schizophrenia, Psychosis, Epidemiology

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Introduction

One in two people with schizophrenia will experience a concurrent anxiety disorder, markedly higher than that of the general population (1). Moreover, the anxiety is not attributable to the psychotic phenomena alone, since anxiety symptoms tend to precede the onset of psychotic disorders in at least half of all patients (1).

Lifetime prevalence rates of anxiety disorders in schizophrenia and related disorders have been reported to be 8 to 29% for obsessive-compulsive disorder (OCD) (2-9), 10 to 60% for obsessive-compulsive symptoms (10), 19 to 25% for panic disorder (2-6, 8), 15 to 47.5% for panic attacks (11, 12), 16 to 17% for social anxiety and phobia (2-8) and 13% for generalized anxiety disorder (GAD) (8). A recent meta-analysis of fifty-two studies reported pooled rates of 12.1%

Clinical Implications

This study suggests that there is a significant overrepresentation of anxiety symptoms in schizophrenia/schizoaffective, bipolar, depressive and other psychotic disorders. The overrepresentation of anxiety symptoms in the diverse diagnostic groups suggests the necessity for appropriate screening and evidence-based integrated treatment approaches for the anxiety symptoms beyond treating psychotic symptoms alone. People with psychotic disorders, beyond schizophrenia alone, who appear at greater risk of significant anxiety symptoms include women smokers and those with reported medication side effects and social dysfunction. Similarly, screening for these risk factors may assist with prioritizing and better integrating treatment.

Future research directions include prospective, observational studies of people with a range of psychotic disorders. In addition, syndromal assessment and classification of psychosis types that are most adversely affected by anxiety, as well as identification of comorbidity, service utilization/related costs, risk and general health morbidity would inform a more holistic paradigm of illness severity. In turn, the impact of specifically tailored treatments in naturalistic mental health service settings, such as the rationalization of medication according to evidence-based, individual and group cognitive behavioral therapy and cognitive remediation, could then be evaluated.

for obsessive-compulsive disorder, 14.9% for social phobia, 10.9% for generalized anxiety disorder, 9.8% for panic disorder and 12.4% for posttraumatic stress disorder among people with schizophrenia (13).

The presence of anxiety disorders and symptoms in schizophrenia is associated with poorer quality-of-life and work outcomes (12, 14-22). Also, the prevalence of anxiety may be associated with an earlier age of onset of the psychotic disorder (23). The presence of OCD, social phobia, or panic attacks was found to be associated with a 2.6 to 3.5 increased odds of developing schizophrenia (24). Some antipsychotic medications may also induce anxiety or anxiety-like symptoms. The inner restlessness, inability to relax, and fidgetiness characteristic of akathisia is experienced by up to a third of patients receiving antipsychotic treatment and may be interpreted as anxiety symptoms (25). Another cause of anxiety in people with schizophrenia and related disorders is substance abuse, dependence, or withdrawal. Given the reported high prevalence of tobacco smoking (66.6%) (26), alcohol abuse/dependence (51%), and substance abuse/dependence (32 to 51%) in psychotic disorders (27), it is important to rule out medication and/or substance-related causes when evaluating anxiety in schizophrenia and related disorders.

Aims of the Study

The present study used data collected as part of the Australian Survey of High Impact Psychosis (SHIP) to examine the prevalence of anxiety symptoms among people with psychotic disorders. In addition, disorder-specific comparisons of anxiety symptom prevalence were conducted and correlates with anxiety symptom prevalence were examined. This is in contrast to most studies, which are restricted to schizophrenia rather than a comparison of prevalence in diverse diagnostic groups. Also, most previous studies are limited methodologically by small sample sizes and by including only admitted patients, in contrast to that of the current study.

Methods

The Second Australian National Survey of Psychosis (The Study of High Impact Psychosis [SHIP]) covered a population of some 1.5 million people aged 18–64 years, which was approximately 10% of the Australian population in this age group. A two-phase design was used. In Phase 1, screening for psychosis took place in public mental health services and in non-government organizations supporting people with a mental illness in the census month (March 2010). In Phase 2, people who were screened positive for psychosis in Phase 1 were randomly selected and stratified by catchment site and age group (18–34 years and 35–64 years) for interview and assessment. People were excluded from the interview phase if they had insufficient English, were unable to provide informed consent due to communication or cognitive impairment, completed an invalid interview, or were unavailable for interview due to residence in a nursing home or serving a custodial prison sentence.

Of 7,955 people who screened positive for psychosis and were eligible, there were 1,825 interviewed in Phase 2. Interviewing took place from April 2010 to December 2010. Data were collected on symptomatology, substance use, cognitive ability, functioning, disability, physical health, mental health service utilization, medication use, education, employment and housing. The study was approved by institutional human research ethics committees at each of the seven study sites and all participants provided written informed consent. Full details of the survey methodology are provided in Morgan et al. (28).

The Psychosis Screen—used for screening for psychosis in the census month—was developed specifically for the Australian National Low Prevalence (Psychotic) Disorders Study 1997–1998 (29). The Diagnostic Interview for Psychosis (DIP) (Diagnostic Module) is a semi-structured clinical interview used to generate both *DSM-IV* and *ICD-10* diagnoses (30). The DIP assesses family history of schizophrenia, lifetime prevalence of hallucinations and delusions, duration and course of illness, as well as measures of lifetime suicidal behavior (attempts and ideation). Modifications to the original DIP instrument for the SHIP included changes to the substance-use sections examining illicit drugs, alcohol and cigarette smoking. The revised substance-use sections include items from the Alcohol Use Disorders Identification Test (AUDIT) (31), the Drug Abuse Screening Test (32), the CAGE Questionnaire (33), and the Fagerstrom Test for Nicotine Dependence (34).

The DIP also assessed sociodemographics, childhood experiences (including occurrence of distressing or traumatic events), social participation and functioning, physical health (including family history of illness), quality of life, psychopathology (negative symptoms and worry, panic, anxiety, and obsessions), service use and perceived need. Participants rated whether they had experienced any generalized anxiety (1 item), specific phobia (1 item), social anxiety (2 items), and obsessive-compulsive symptoms (2 items) in the previous twelve months. Items capturing anxiety disorder diagnoses were adapted from the stem questions within the Mini-International Neuropsychiatric Interview (MINI) (35), which has been validated against the Structured Clinical Interview for DSM Disorders (SCID) (36), with reliabilities (Kappas) for panic disorder of 0.81, social phobia of 0.60, GAD of 0.70 and OCD of 0.6. Wording of questions was aligned with the Schedules for Clinical Assessment in Neuropsychiatry (SCAN) (37) to ensure compatibility with the rest of the DIP. For example, the generalized anxiety item was worded as follows: "I am going to ask you some questions about very common experiences. In the last 12 months have there been times when you were a worrier, that is when you worried a lot more about things than other people with the same problems as you?" Generalized anxiety symptoms were recorded as present if participants reported at least mild worrying. Specific phobia symptoms were recorded as present if respondents reported any specific phobias. Social anxiety symptoms were recorded as present if participants reported excessive fear, distress, or shyness in social situations. Obsessive-compulsive symptoms were recorded as present if respondents reported compulsions in relation to checking and repeating, excessive orderliness, or cleanliness.

Data Analyses

Analyses were conducted using Stata version 12.1 (StataCorp LP, College Station, Texas, USA). Means and standard deviations were calculated for continuous variables, and frequencies were measured for categorical variables. Multiple logistic regression was conducted to evaluate diagnostic group as a predictor of the presence of any anxiety or phobic symptoms after controlling for demographics (38), substance use (39), and clinical variables. Demographic variables comprised sex and current age, while substance-use variables included smoking in past 12 months (yes vs. no), amphetamine use in past 12 months (yes vs. no), cannabis use in past 12 months (yes vs. no), and caffeine use (in mg). Clinical variables included family history of schizophrenia (yes vs. no) (40), age of illness onset (41), social dysfunction (yes vs. no) (18), any depressive symptoms in past 12 months (yes vs. no) (42), Social and Occupational Assessment Scale scores, Negative Syndrome score, and any medication side effects (yes vs. no) (41). Missing data were deleted on a listwise basis.

For all analyses, a value of $p<0.05$ was considered statistically significant. Adjustments were not made for multiple comparisons because our primary aim was to examine group differences when controlling for demographic, substance use, and clinical variables rather than examining the extent to which these variables predicted the presence of anxiety symptoms. Moreover, adjusting for multiple comparisons using Bonferroni corrections directly targets the Type 1 error problem, but it does so at the expense of Type 2 error. Thus, such corrections can severely reduce power to determine an important effect (43).

Results

Table 1 presents the characteristics of the sample. Around 60% were male, with a mean age of 38.36 years (SD=11.16). Post-school qualifications were held by under half of the sample, while over half were unemployed at the time of the interview. The most common *ICD-10* diagnoses were schizophrenia or schizoaffective disorder (63.0%) and bipolar (mania) disorder (17.5%).

The prevalence of the generalized anxiety, panic, phobic, social anxiety and obsessive-compulsive domains of anxiety symptoms, endorsed according to diagnostic group in the previous 12 months, is presented in Table 2. The prevalence of overall anxiety symptoms in the preceding 12 months was 56.4% (n=648) for the combined schizophrenia or schizoaffective disorder group, 64.9% (n=207) for the bipolar group, 77.8% (n=63) for the depressive psychosis group, and 63.3% (n=174) for the "other psychoses" group. The "other psychoses" group included nonorganic psychoses with delusions, and depression without psychotic features not meeting criteria for a psychotic depression.

Table 1 Characteristics of the Sample

	N (%)
Sex	
Male	1,087 (59.6)
Female	738 (40.4)
Age	
Mean (SD)	38.4 (11.2)
Range	18–65
Education	
Left school, no qualification	615 (34.0)
Secondary school qualification	304 (16.8)
Postsecondary qualification	891 (49.2)
Employment	
Employed	596 (32.7)
Not seeking work (i.e., retired, unpaid work, home duties, student)	258 (14.1)
No formal activity/unemployed	971 (53.2)
***ICD-10* Diagnoses**	
Schizophrenia/schizoaffective	1,150 (63.0)
Bipolar (mania)	319 (17.5)
Psychotic depression	81 (4.4)
Other psychosis*	275 (15.1)

*Other psychosis category includes delusions and non-organic psychoses, depression without psychosis, and screened positive for psychosis but did not meet the criteria for a psychosis diagnosis.

The results of the multiple logistic regressions examining diagnostic group as a predictor of the presence of generalized anxiety, phobic, panic, social anxiety and obsessive-compulsive after controlling for demographic, substance use, and clinical variables are presented in Table 3. Female gender was a highly significant predictor of generalized anxiety, phobic and panic symptoms, and less so for social anxiety. Family history of schizophrenia was associated with panic symptoms. Social dysfunction was associated with social anxiety and (less strongly) with obsessive-compulsive symptoms. The presence of any depressive symptoms in the previous twelve months was significantly associated with any anxiety symptoms, notably generalized anxiety, panic and social anxiety. Medication side effects, recorded either as present or absent, were associated with phobic and obsessive-compulsive symptoms.

Smoking was a significant predictor for all domains of anxiety, except generalized anxiety. While caffeine use was significantly associated with phobic symptoms, the odds ratio was very close to, and rounded to, 1. Amphetamine use was associated with less social anxiety. Cannabis was not associated with significantly increased rates of any anxiety domains.

In terms of psychotic disorder groups—with schizophrenia/schizoaffective disorder being the reference group—psychotic depression was highly associated (OR 3.71) with generalized anxiety; but, caution is required in accepting the veracity of this given the high standard error of 1.82. Otherwise, the diagnostic groups were not predictive of any specific type of anxiety symptomology over the preceding twelve months.

Table 2 Prevalence of Anxiety Symptoms in the Past Twelve Months

	Schizophrenia/ Schizoaffective Disorder		Bipolar (Mania)		Depressive Psychosis		Other Psychosis*		Total Sample	
	N	%	N	%	N	%	N	%	N	%
Generalized anxiety	685	60.5	224	70.6	72	91.1	176	65.7	1,157	64.4
Panic	515	45.5	176	55.5	58	73.42	139	51.5	888	49.4
Phobic	376	33.6	121	38.2	37	46.8	108	39.9	645	35.9
Social anxiety	467	41.4	138	43.7	57	71.3	108	40.0	770	42.9
Obsessive-compulsive	312	27.1	92	28.8	35	43.2	72	26.2	511	28.0

*Other psychosis category includes delusions and non-organic psychoses, depression without psychosis, and screened positive for psychosis but did not meet the criteria for a psychosis diagnosis.

Table 3 Multiple Logistic Regression Predicting the Presence of Anxiety Symptoms in the Past Twelve Months

	Generalized Anxiety N=1,313			Panic N=1,315			Phobic N=1,314			Social Anxiety N=1,327			Obsessive-Compulsive N=1,327		
	OR	SE	(95% CI)	OR	SE	(95% CI)	OR	SE	(95% CI)	OR	SE	(95% CI)	OR	SE	(95% CI)
Sex*	2.29‖	0.32	(1.73–3.02)	2.27‖	0.30	(1.76–2.94)	2.10‖	0.27	(1.63–2.71)	1.31‡	0.17	(1.01–1.68)	1.23	0.17	(0.94–1.60)
Age	1.01	0.01	(0.99–1.02)	1.00	0.01	(0.99–1.02)	1.00	0.01	(0.99–1.02)	0.99	0.01	(0.98–1.01)	1.00	0.01	(0.99–1.01)
Family history of schizophrenia	1.19	0.17	(0.90–1.57)	1.29‡	0.18	(0.98–1.68)	1.11	0.15	(0.85–1.45)	1.22	0.16	(0.94–1.58)	1.21	0.17	(0.92–1.59)
Smoking (past 12 months)	1.13	0.15	(0.87–1.46)	1.68‖	0.22	(1.30–2.16)	1.70‖	0.23	(1.31–2.22)	1.83‖	0.24	(1.42–2.37)	1.58§	0.23	(1.19–2.09)
Amphetamine use (past 12 months)	1.03	0.19	(0.72–1.48)	1.04	0.18	(0.73–1.47)	1.12	0.20	(0.79–1.59)	0.69‡	0.12	(0.49–0.98)	0.91	0.17	(0.63–1.31)
Cannabis use (past 12 months)	0.84	0.12	(0.64–1.11)	1.28	0.17	(0.98–1.66)	1.13	0.15	(0.87–1.47)	1.21	0.16	(0.93–1.56)	1.20	0.17	(0.91–1.57)
Caffeine use (mg)	1.00	0.00	(1.00–1.00)	1.00	0.00	(1.00–1.00)	1.00‖	0.00	(1.00–1.00)	1.00	0.00	(1.00–1.00)	1.00	0.00	(1.00–1.00)
Social dysfunction	1.21	0.21	(0.87–1.70)	1.04	0.17	(0.75–1.45)	1.19	0.20	(0.86–1.65)	1.70§	0.28	(1.23–2.35)	1.42‡	0.25	(1.00–2.01)
Any depressive symptoms (past 12 months)	3.09‖	0.41	(2.39–4.00)	3.05‖	0.39	(2.38–3.91)	1.53§	0.20	(1.19–1.97)	2.82‖	0.36	(2.20–3.62)	1.64‖	0.23	(1.25–2.15)
Social and Occupational Assessment Scale	1.00	0.00	(0.99–1.01)	1.00	0.00	(0.99–1.01)	0.99	0.00	(0.98–1.00)	1.01‡	0.00	(1.00–1.02)	1.00	0.01	(0.99–1.01)
Age of illness onset	0.99	0.01	(0.98–1.01)	0.99	0.01	(0.98–1.01)	1.01	0.01	(0.99–1.03)	1.01	0.01	(0.99–1.02)	1.00	0.01	(0.98–1.02)
Negative syndrome score	1.00	0.02	(0.96–1.04)	0.99	0.02	(0.96–1.03)	0.95§	0.02	(0.91–0.99)	1.00	0.02	(0.97–1.04)	1.00	0.02	(0.96–1.04)
Any medication side effects	1.25	0.19	(0.93–1.69)	1.22	0.18	(0.91–1.64)	1.56§	0.24	(1.14–2.12)	1.16	0.17	(0.87–1.56)	1.62§	0.27	(1.17–2.26)
***ICD-10* Diagnosis**															
Schizophrenia/schizoaffective disorder†	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Bipolar (mania)	1.28	0.24	(0.89–1.84)	1.11	0.19	(0.79–1.56)	0.94	0.16	(0.67–1.32)	0.85	0.14	(0.61–1.19)	1.02	0.18	(0.72–1.45)
Psychotic depression	3.71§	1.82	(1.42–9.70)	1.69	0.56	(0.88–3.23)	1.54	0.46	(0.86–2.75)	1.57	0.49	(0.85–2.91)	1.65	0.48	(0.93–2.91)
Other psychosis¶	1.09	0.21	(0.75–1.59)	0.90	0.16	(0.63–1.28)	1.25	0.22	(0.88–1.77)	0.71	0.13	(0.50–1.02)	0.85	0.17	(0.58–1.25)
Constant	0.37‡	0.18	(0.15–0.94)	0.19‖	0.09	(0.08–0.46)	0.14‖	0.07	(0.06–0.35)	0.10‖	0.05	(0.04–0.25)	0.07‖	0.04	(0.03–0.19)

*Male is the reference category; †Reference category; ‡p<.05; §p<.01; ‖p<.001. ¶Other psychosis category includes delusions and non-organic psychoses, depression without psychosis, and screened positive for psychosis but did not meet the criteria for a psychosis diagnosis.

Discussion

The present study examined the prevalence of anxiety symptoms in Australians with psychotic disorders who participated in the SHIP study. Over half of the sample (59.8%) reported experiencing symptoms of anxiety in the previous twelve months. The highest prevalence (77.8%) of anxiety symptoms was reported by the depressive psychosis group, while the lowest was reported by the schizophrenia/schizoaffective disorder group (56.4%). The twelve-month prevalence rate of anxiety symptoms in the present sample (59.8%) was higher than lifetime prevalence rates of anxiety disorders reported in psychotic disorders (13, 41). All five anxiety domains were overrepresented in each of the psychotic disorders in comparison with the general population, primary care (44) and akin to that found in mood disorders in a clinical population (45).

Although women had a higher prevalence of anxiety disorders than men, the predictiveness of female gender for generalized anxiety, phobic and panic symptoms and, less so, for social anxiety in people with the range of psychotic disorders in the study is, to our knowledge, a new finding. This is akin to the increased prevalence of anxiety disorders in women in general (46). While women appear to have a greater illness burden with anxiety disorders (46), the evaluation of this among those with psychotic disorders was beyond the scope of the study.

The study's finding that a family history of schizophrenia was associated with panic symptoms was also a novel finding; and, although panic attacks are associated with schizophrenia (41), causality of this association was also beyond the scope of the present study.

While there is a strongly established relationship with cigarette smoking and schizophrenia (26), the finding that smoking was a significant predictor for all domains of anxiety—except generalized anxiety—across the psychotic disorders studied is a novel finding, consistent with the established interrelationship of smoking with anxiety disorders (47). These interrelationships include: smoking increased anxiety sensitization to anticipatory anxiety and panic avoidance (48) and generalized anxiety (49), with the latter not demonstrated in the current study; smoking predisposing to anxiety disorders by adversely affecting neurodevelopment and neurotransmitter pathways that modulate anxiety (49); the direct effects of smoking on respiratory and autonomic systems that modulate physical responses to anxiogenic stimuli (49); nicotine dependence being associated with an increased risk of anxiety disorders (50); and, nicotine withdrawal (51). On the other hand, smoking was not found to predispose to anxiety disorders in a large genotype study of smokers with a single-nucleotide polymorphism located on the nicotine acetylcholine receptor gene (52).

Apart from psychotic depression being associated with a marginally higher rate of generalized anxiety, diagnostic group did not significantly predict the presence of any anxiety symptoms in the previous twelve months. The presence of any depressive symptoms in the previous twelve months was significantly associated with all anxiety symptoms, particularly generalized anxiety, panic and social anxiety symptomatology across diagnostic groups, akin to that in mood disorders (45). To our knowledge, this is the first study to specifically highlight this association, rather than measure co-occurrence.

There is an established link between social dysfunction and schizophrenia (53). Akin to social dysfunction being associated with social anxiety (54) and schizophrenia (55), we found that this was the case across the more diverse group of psychotic disorders studied. The explanation for the unexpected association of amphetamine use with less likelihood of social anxiety across the diagnostic groups is not clear, and was beyond the scope of the study to ascertain. While amphetamine use may worsen positive symptoms of schizophrenia and related disorders, this finding is inconsistent with that of chronic amphetamine abuse inducing social phobia (56). Alternatively, the amphetamine use may be used in an attempt to mitigate social anxiety (57), albeit there is minimal supportive evidence for its role in "self-medication" (58, 59).

Our finding that medication side effects, either present or absent, were predictive of obsessive-compulsive symptoms is consistent with previous reports of atypical antipsychotic-induced obsessive-compulsive symptoms in schizophrenia (9). While increased negative symptoms are associated with OCD comorbidity in chronic schizophrenia (9), the SHIP data did not bear this out.

The present study suggests that there is a significant overrepresentation of anxiety symptoms in schizophrenia/schizoaffective, bipolar, depressive and other psychotic disorders. The overrepresentation of anxiety symptoms in the diverse diagnostic groups suggests the necessity for appropriate screening and evidence-based integrated treatment approaches for the anxiety symptoms beyond treating psychotic symptoms alone. People with psychotic disorders, beyond schizophrenia alone, who appear at greater risk of significant anxiety symptoms include women smokers and those with reported medication side effects and social dysfunction. Similarly, screening for these risk factors may assist with prioritizing and better integrating treatment.

Future research directions include prospective, observational studies of people with a range of psychotic disorders. In addition, syndromal assessment and classification of psychosis types that are most adversely affected by anxiety, as well as identification of comorbidity,

service utilization/related costs, risk and general health morbidity would inform a more holistic paradigm of illness severity. In turn, the impact of specifically tailored treatments in naturalistic mental health service settings, such as the rationalization of medication according to evidence-based, individual and group cognitive behavioral therapy and cognitive remediation, could then be evaluated.

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Declaration of Interest

The authors report no conflicts of interest. The authors alone are responsible for the content and writing of the paper.

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