Correlates of employment interest among adults with schizophrenia

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Abstract

Background/Aims: Role functioning is an important part of recovery and psychiatric rehabilitation for people with schizophrenia. However, little is known about why some people and not others return to socially valued roles such as employment. While the demographic and clinical correlates of employment have been extensively studied, little is known about how employment interest forms and develops into actual employment activity. The aim was to compare demographic and clinical correlates of employment interest to correlates of actual employment participation.

Methods: A community sample of 255 working-age adults with schizophrenia or schizoaffective disorder were interviewed about their current employment status and current employment interest. Univariate logistic regression was used to examine the demographic and clinical correlates of both employment interest and participation.

Findings: Age, employment history and severity of current hallucinations were associated with both employment interest and participation, while illness severity pattern, illness course, severity of disability, and severity of avolition were associated only with employment participation.

Conclusions: Resilience of employment interest to the clinical symptoms of schizophrenia is a promising finding. Those with more severe illness patterns and more impaired functioning can remain good candidates for vocational rehabilitation, because interest and motivation for employment may be unaffected.

Key words: ■ Psychotic disorders ■ Role functioning ■ Employment ■ Vocational rehabilitation

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Individual demographic and clinical characteristics were once thought to be the best predictors of a person's return to socially valued roles such as employment (Jonsdottir and Waghorn, 2015).

However, studies of supported employment programmes show that most people interested in employment can succeed with the right type of assistance (Campbell et al, 2011). There is mounting evidence that the nature of the assistance may be more important than individual characteristics (Jonsdottir and Waghorn, 2015) in predicting recovery in socially valued roles such as employment. However, individual characteristics may be more useful for predicting when people with schizophrenia and other severe and persistent mental illnesses (SPMI) volunteer for rehabilitation and establish role-functioning goals (Westcott et al, 2015).

Supported employment programmes are intended for those who have an employment goal and are seeking

assistance to achieve that goal. This means that we need to understand why some people volunteer for such programmes and others do not. It is possible that the correlates of forming vocational goals are different from the correlates of participating in employment. It is important to explore these in order to predict when people will volunteer for supported employment programmes and other forms of vocational rehabilitation.

Recent studies have shown that interest in employment may be an important precursor to forming a vocational goal (Westcott et al, 2015). If so, interest may be a useful indicator of the potential demand for a vocational programme once it becomes established in a particular location. Although there have been many studies of the individual demographic and clinical correlates of employment (Jonsdottir and Waghorn, 2015), there have been few studies of how interest develops, or how vocational goals are formed.

Demographic correlates of employment

Age has consistently correlated with employment status in observational studies when no specific employment intervention is being provided (Waghorn et al, 2009; 2012; 2014). In population surveys in Australia, age combines with diagnostic category and severity of psychiatric disability to produce different working age trajectories that deviate from those of healthy adults (Waghorn et al, 2009). In people with psychotic disorders (Waghorn et al, 2012) the proportion of employed peaks in the youngest age group of 18–24 years at 51.5%, decreasing monotonically to 18.9% by 55–64 years. The presence of interventions such as intensive supported employment programmes can moderate the influence of age on employment outcomes (Bond and Drake, 2008; Tsang et al, 2010), with studies often reporting no influence for age, or that only younger people are more likely to be employed (Wewiorski and Fabian, 2004; Burke-Miller et al, 2006; Salkever et al, 2007).

Employment history has a stronger and more consistent relationship to future employment than other individual characteristics (McGurk et al, 2003; Michon et al, 2005; Catty et al, 2008; Tsang et al, 2010). A positive work history was found to predict future competitive employment, regardless of whether individuals were receiving employment services or not (Bond and Drake, 2008). However, a longitudinal study by Harrison et al (1996) found that premorbid employment status had little predictive power following adjustment for other demographic and clinical variables.

Educational attainment for people with SPMI in Australia has been associated with current and future employment. In a national survey of psychosis, Waghorn et al (2002) found that those without Year 10 certificates had 3.8 times reduced odds of being employed than those receiving Year 10 and Year 12 certificates. In the UK, individuals with schizophrenia with a university degree were more likely to be employed than those without a degree (Marwaha et al, 2007). Educational attainment has also predicted employment in other countries (Mueser et al, 2001; Russinova et al, 2002; Norman et al, 2007). Tsang et al (2010) found 12 studies where education was predictive and seven studies where it was not. Most of the studies reviewed were intervention studies where the employment assistance provided may have overcome any disadvantages due to limited education.

Clinical correlates of employment

Clinical characteristics are frequently examined in order to identify individuals who may need more support to attain their employment goals (Razzano et al, 2005). For example, individuals with a more chronic course pattern of illness (such as multiple

episodes with residual symptoms between episodes) were less likely to be employed than those with a single episode with good recovery marked by few residual symptoms (Waghorn et al, 2002; Waghorn et al, 2003; Marwaha et al, 2007).

In a narrative review, positive symptoms were found to be significant predictors of employment in five of 16 studies (Tsang et al, 2010). In other reviews, positive symptoms were not consistently correlated with functioning (Slade and Salkever, 2001; Shamsi et al, 2011). In contrast, negative symptoms (affective flattening, alogia, avolition and anhedonia) were considered a stronger influence on employment functioning than positive symptoms (Hoffmann et al, 2003; Rosenheck et al, 2006). Slade and Salkever (2001) found negative symptoms had a greater adverse effect on employment than depressive symptoms, positive symptoms, and extra-pyramidal side effects. An observational study of 2300 people with schizophrenia found that those with more severe negative symptoms had poorer employment outcomes (Salkever et al, 2007).

Correlates of interest in employment

Because interest in employment is likely to precede the actions involved in accessing employment or employment assistance, understanding the correlates most consistently associated with positive interest may further our understanding of individual characteristics most relevant to the provision of vocational rehabilitation. The influence of demographic and clinical correlates of interest in employment has not, to our knowledge, been examined previously. In addition, it is unknown whether the demographic or clinical correlates of interest in employment activity are also correlates of actual employment activity. The aim of this study was to compare demographic and clinical correlates of interest in employment to those of actual employment activity, among adults with schizophrenia and schizoaffective disorder.

METHODS

Data source

The participants for the current study were drawn from the Australian cohort of a large, multi-site (USA and Australia) collaborative study: the Molecular Genetics of Schizophrenia, part two (MGS2) (Shi et al, 2009), funded by the National Institute of Mental Health. Participants, primarily from South East Queensland, were interviewed between 2003 and 2008, and were invited to participate in a follow-up study of role functioning. There were 654 individuals in the total Australian MGS2 sample, all of whom had recent contact with mental health services. The original participants were recruited through mental health

clinics, hospitals, physician referrals, advocacy and support organisations, internet and media announcements, and newspaper advertisements.

Sampling

Between 2005 and 2008, 374 volunteers who were interested in participating in follow-up research and met the inclusion criteria of age (18–65 years) and clinical status (not in hospital or acutely unwell) completed a 20-minute telephone interview about role functioning. Written informed consent was obtained from all participants. To compensate for their time, each participant received a \$50 shopping voucher. From a total sample of 255, complete and accurate interview records were available for 254 individuals with a DSM-IV-TR (American Psychiatric Association (APA), 2000) diagnosis of schizophrenia or schizoaffective disorder. Participant characteristics are shown in *Table 1*.

Diagnosis of schizophrenia or schizoaffective disorder was based on the best estimate final diagnosis method (Leckman et al, 1982). The sample was limited to European Caucasian ethnicity for genetic purposes. Generalisability of these results to the Australian population was examined by comparing sample characteristics to those reported in the second national survey of psychosis conducted in Australia in 2010 (Morgan et al, 2012).

Measures

The Diagnostic Interview for Genetics Studies (DIGS) 2.0 is a semi-structured clinical interview developed by the National Institute of Mental Health (NIMH) Genetics Initiative (Nurnberger et al, 1994). It is a comprehensive assessment of psychotic, affective, and substance use disorders using DSM-IV criteria (APA, 1994). The DIGS 2.0 also provided essential demographic and extensive clinical information (*Table 1*). The clinical information available from the DIGS about positive and negative symptoms was at a level of detail rarely reported in rehabilitation research.

The Socially-valued Role Classification Scale (SRCS) measures role functioning in five domains:

- Home duties and self-care
- Caring for others
- Rehabilitation and self development
- Education and training
- Employment (Waghorn et al, 2007; Harris et al, 2011).

The SRCS has good test-retest reliability and internal consistency; moderate to very good concurrent validity; and adequate face validity, user acceptability, and utility to individuals with schizophrenia and schizoaffective disorder (Lloyd et al, 2010; Harris et al, 2011). For the purpose of this study, only employment information was examined, and the time frame was for the previous 4 weeks. Employment refers to paid work at minimum wage or above, or self-employment,

or being employed in a family business or on a family farm for at least 1 hour a week. This definition follows the international definition of employment used by the Australian Bureau of Statistics (1996).

Interest in employment was assessed by a single question ('Are you interested in employment as a goal for the future?') and coded as 'yes' or 'no'. Work history over the past 5 years was assessed during the original DIGS interview. 'Work' was defined in the DIGS as meaning responsibilities at work, home or school, and was classified into five ranked categories:

1. Always worked full time (employed, homemaker or student)
2. Periods of unemployment not due to psychiatric illness
3. Lost up to 33% of work time (weeks not worked or work hours reduced) due to psychiatric illness
4. Lost more than 33%, up to 67% of work time due to psychiatric illness
5. Lost more than 67% of work time or completely unable to work due to psychiatric illness.

For our analysis good work history was defined as classifications 1 and 2, which was contrasted with poor work history, defined as categories 3 to 5, as the reference category. Analyses were completed in SPSS for Windows, version 20.0. The Chi-square (Wald test) was used to calculate odds ratios and 95% confidence intervals.

RESULTS

Detailed descriptions of the demographic and clinical characteristics of the sample appear in *Table 2*. Correlates of employment are shown in *Table 3*. Age and employment history were the only demographic variables associated with employment. Among the clinical variables, severity of pattern of illness, course of illness, Global Assessment of Functioning (GAF), severity of current hallucinations, and avolition were associated with employment. Those with no loss of volition or no hallucinations in the previous month were more likely to be employed than those with marked avolition or hallucinations.

Table 4 shows the correlates of interest in employment for those not yet participating in employment. These results differ from the correlates of employment mostly in terms of a reduced influence of demographic and clinical variables on interest in employment.

Interest in employment was significantly stronger in younger people (18–34 years), and among those with a good work history. No variables of functioning and only one clinical variable, severity of current hallucinations, were associated with interest in employment. Thus, interest in employment is stronger in younger adults and in those with a work history, but it was also less

Table 1. Participant characteristics

Characteristic (n=254)	Categories	Value
Age	Years	Mean: 38.3; Standard deviation: 11.4 Range: 18–65
		Frequency (%)
Sex	Male	173 (67.8)
	Female	82 (32.2)
Diagnosis	Schizophrenia	240 (94.1)
	Schizoaffective disorder	15 (5.8)
Marital status	Married	19 (7.5)
	Never married	184 (72.2)
	Separated/divorced	50 (19.6)
	Widowed	2 (0.8)
Living arrangement	Alone	95 (37.3)
	Facility	12 (4.7)
	Family	118 (46.3)
	Others (e.g. housemates that are not family members)	30 (11.8)
Years of schooling	Less than Year 12	144 (56.5)
	Completed up to Year 12	52 (20.4)
	Tertiary education	59 (23.1)
Employment status	Employed in previous 4 weeks	88 (34.5)
	Not employed in previous 4 weeks	167 (65.5)
Global assessment of functioning scale	No impairment (81–100)	4 (1.6)
	Mild (61–80)	99 (39.0)
	Moderate (31–60)	141 (55.5)
	Severe (1–30)	10 (3.9)
Illness course	Episodic with residual symptoms (episodes of psychosis and significant residual symptoms between episodes)	31 (12.2)
	Episodic with no residual symptoms (episodes of psychosis and no significant residual symptoms between episodes)	3 (1.2)
	Continuous	199 (78.3)
	Single episode (single episode of schizophrenia and either some or no clinically significant residual symptoms)	21 (8.3)
Delusions (ranged in severity from mild to severe but are not differentiated here)	Lifetime	252 (98.8)
	No delusions	2 (1.2)
	Previous 30 days	145 (56.9)
	Not in past 30 days	109 (43.1)
Hallucinations (ranged in severity from mild to severe but are not differentiated here)	Lifetime	235 (92.2)
	No hallucinations	19 (7.8)
	Previous 30 days	116 (45.4)
	Not in past 30 days	138 (54.6)

Table 2. Definitions of clinical variables

Variable	Description	Levels or comparison groups
Severity pattern of illness	Deterioration pattern since the onset of the illness	Mild, moderate, severe
Illness course	Pattern of recovery between episodes	Single episode with remission, episodic with and without inter-episode residual symptoms, and continuous course with ongoing residual symptoms
Global Assessment of Functioning scale	Subjectively rates the social, occupational, and psychological functioning of an individual, e.g. how well one is meeting various problems-in-living	Mild (61–100) and severe (0–60)
Affective flattening	Overall unresponsiveness, inappropriateness and overall decrease in emotional intensity	None, mild, moderate, marked
Avolition	Grooming, hygiene, impersistence and physical anergia	None, mild, moderate, marked
Alogia	Poverty of speech or content	Yes, no
Anhedonia	Reduced interests and activities, sexual activity, ability to feel closeness and relationship with peers and family	Yes, no
Delusions	Severity of delusions (range of delusions from DSM-IV-TR; American Psychiatric Association, 2000) in the past 30 days	None, mild, moderate, marked
Hallucinations	Severity of hallucinations (range of hallucinations from DSM-IV-TR; APA, 2000) in the past 30 days	None, mild, moderate, marked
Treatment resistance as defined for genetic analyses	Positive and negative symptoms in moderate to marked range, GAF score below 60, continuous course of illness, moderate to severe deterioration, and must be taking anti-psychotic medication	Yes, no
Depressive symptoms	Number of depressive symptoms based on the DSM-IV-TR major depressive episode criteria (APA, 2000)	Less than five symptoms, five or more symptoms

prone to the negative influences of other demographic and clinical variables, compared to the correlates of being actually employed.

DISCUSSION

To our knowledge, this study is the first to examine correlates of interest in employment alongside correlates of actual employment in a community-based sample of adults with schizophrenia and schizoaffective disorder. The many specific clinical variables examined are rarely reported in rehabilitation research.

Assuming that interest precedes action, and given that most employment services are voluntary for this population, developing interest in employment as a recovery goal could be an important intervention focus. Such a focus could increase demand for existing vocational rehabilitation services. Employment interest, and therefore demand for employment assistance, is most likely to be strongest among those aged 18–34 years with previous employment experience. Interest in employment does not seem as vulnerable to the effects of clinical variables, other than one positive symptom (hallucinations), compared to actual employment. This implies that while interest in employment declines

with age, it does not decline with clinical severity of illness as much as actual participation in employment.

Our results suggest that early intervention is needed to increase availability of employment assistance to younger people with employment goals, before interest in employment wanes. Furthermore, interest in employment can persist through later years, and in the absence of work. This means that older individuals remain promising candidates for tailored vocational rehabilitation interventions, relatively independently of fluctuations in their symptom severity. For example, *Table 4* shows that 64.8% of those aged 45–65 years were interested in employment.

The positive associations of employment history with both interest in employment and actual employment are consistent with previous studies (Anthony, 1994; Mueser et al, 2001; Burke-Miller et al, 2006; Tsang et al, 2010). While it is well known that age can be a weak to moderate correlate of actual employment (Mueser et al, 2001; Burke-Miller et al, 2006), the results with respect to employment interest showed a stronger relationship with age. This may help explain the mixed findings in the literature, where some studies have found no association between age and employment status, particularly when an employment intervention was involved (Slade and Salkever, 2001; Shamsi et

Table 3. Demographic and clinical correlates of actual employment

Variable ¹	Category	Employed	Not employed	OR ²	95% CI	p
		n (%)	n (%)			
Age (years) (n=255)	18–34	41 (38.0)	67 (62.0)	1.98	1.02–3.86	0.05
	35–44	30 (40.0)	45 (60.0)	2.16	1.06–4.40	0.04
	45–65 (reference)	17 (23.6)	55 (76.4)			
Sex (n=255)	Female	34 (41.5)	48 (58.5)	1.56	0.91–2.69	0.11
	Male (reference)	54 (31.2)	119 (68.8)			
Living arrangement (n=243)	Alone	27 (28.4)	68 (71.6)	0.63	0.36–1.10	0.11
	Others (reference)	57 (38.5)	91 (61.5)			
Years in education (n=255)	Tertiary education	23 (39.0)	36 (61.0)	2.15	0.92–5.04	0.08
	Year 10–12	54 (36.5)	94 (63.5)	1.93	0.91–4.10	0.09
	Less than Year 10 (reference)	11 (22.9)	37 (77.1)			
Employment history (n=255)	Good	62 (59.6)	42 (40.4)	7.10	3.99–12.63	<0.001
	Poor (reference)	26 (17.2)	125 (82.8)			
Severity pattern of illness (n=255)	Mild deterioration	42 (52.5)	38 (47.5)	6.19	2.17–17.65	0.001
	Moderate deterioration	41 (28.9)	101 (71.1)	2.27	0.82–6.29	0.11
	Severe deterioration (reference)	5 (15.2)	28 (84.8)			
Illness course (n=254)	Single	12 (57.1)	9 (42.9)	2.81	1.13–7.02	0.03
	Episodic	12 (35.3)	22 (64.7)	1.15	0.54–2.47	0.72
	Continuous (reference)	64 (32.2)	135 (67.8)			
Global Assessment of Functioning (n=254)	Mild (61–100)	47 (45.6)	56 (54.4)	2.25	1.33–3.82	0.003
	Severe (0–60) (reference)	41 (27.2)	110 (72.8)			
Treatment resistance (n=255)	No	73 (37.8)	120 (62.2)	1.91	0.995–3.65	0.052
	Yes (reference)	15 (24.2)	47 (75.8)			
Affective flattening (n=247)	None	9 (37.5)	15 (62.5)	0.90	0.30–2.71	0.85
	Mild	27 (31.4)	59 (68.6)	0.69	0.29–1.62	0.39
	Moderate	37 (34.6)	70 (65.4)	0.79	0.35–1.82	0.59
	Marked (reference)	12 (40.0)	18 (60.0)			
Depressive symptom count (n=255)	< 5 symptoms	43 (35.5)	78 (64.5)	0.92	0.55–1.54	0.72
	≥5 symptoms (reference)	45 (33.6)	89 (66.4)			
Severity of current delusions ³ (n=220)	None	27 (36.0)	48 (64.0)	1.09	0.51–2.34	0.83
	Mild	20 (40.0)	30 (37)	1.29	0.57–2.95	0.54
	Moderate	11 (22.9)	37 (77.1)	0.58	0.23–1.42	0.23
	Marked (reference)	16 (34.0)	31 (66.0)			
Severity of current hallucinations ³ (n=219)	None	47 (45.6)	56 (54.4)	2.29	1.04–5.06	0.23
	Mild	7 (19.4)	29 (80.6)	0.66	0.22–1.93	0.45
	Moderate	11 (28.2)	28 (71.8)	1.07	0.40–2.86	0.89
	Marked (reference)	11 (26.8)	30 (73.2)			
Severity of current avolition ⁴ (n=217)	None	37 (44.0)	47 (56.0)	2.87	1.44–5.71	0.003
	Mild	20 (37.0)	34 (63.0)	2.15	0.99–4.63	0.052
	Marked (reference)	17 (21.5)	62 (78.5)			
Severity of current alogia ⁵ (n=233)	No	45 (30.8)	101 (69.2)	0.70	0.40–1.21	0.20
	Yes (reference)	34 (39.1)	53 (60.9)			
Severity of current anhedonia ⁵ (n=153)	No	38 (46.3)	44 (53.7)	1.92	0.99–3.74	0.054
	Yes (reference)	22 (31.0)	49 (69.0)			

Note: Participation in employment is based on the previous four weeks. ¹See Table 2 for definitions of each variable. ²OR: odds ratios. These were calculated with the ratio of the odds of participating in the role by the odds of not participating in the role divided by the same odds for the reference group. ³Severity of current hallucinations and delusions were derived from the previous 30 days. ⁴Derived from whether avolition was present in the previous 30 days. To increase power due to small cell size for avolition, moderate and marked categories were collapsed. ⁵Derived from whether alogia or anhedonia was present in the previous 30 days. To increase power due to small cell size for alogia and anhedonia, mild, moderate and marked categories were collapsed. CI: confidence interval.

Table 4. Demographic and clinical correlates of interest in employment

Variable ¹	Category	Interest in employment	No interest in employment	OR ²	95% CI	p
		n (%)	n (%)			
Age (years) (n=165)	18–34	58 (87.9)	8 (12.1)	3.94	1.56–9.94	0.004
	35–44	36 (80.0)	9 (20.0)	2.17	0.87–5.45	0.10
	45–65 (reference)	35 (64.8)	19 (35.2)			
Sex (n=165)	Female	35 (76.1)	11 (23.9)	0.85	0.38–1.90	0.69
	Male (reference)	94 (79.0)	25 (21.0)			
Living arrangement (n=157)	Alone	53 (77.9)	15 (22.1)	1.09	0.51–2.32	0.82
	Others (reference)	68 (76.4)	21 (23.6)			
Years in education (n=165)	Tertiary education	31 (88.6)	4 (11.4)	2.14	0.58–7.87	0.25
	Year 10–12	69 (74.2)	24 (25.8)	0.79	0.32–1.97	0.62
	Less than Year 10 (reference)	29 (78.4)	8 (21.6)			
Employment history (n=165)	Good	37 (90.2)	4 (9.8)	3.22	1.06–9.74	0.04
	Poor (reference)	92 (74.2)	32 (25.8)			
Severity pattern of illness (n=165)	Mild deterioration	31 (83.8)	6 (16.2)	1.72	0.51–5.85	0.38
	Moderate deterioration	77 (77.0)	23 (23.0)	1.12	0.42–2.96	0.83
	Severe deterioration (reference)	21 (75.0)	7 (25.0)			
Illness course (n=164)	Single	7 (77.8)	2 (22.2)	0.93	0.18–4.74	0.93
	Episodic	16 (72.7)	6 (27.3)	0.71	0.26–1.99	0.52
	Continuous (reference)	105 (78.9)	28 (21.1)			
Global Assessment of Functioning (n=164)	Mild (61–100)	44 (78.6)	12 (21.4)	1.05	0.48–2.29	0.91
	Severe (0–60) (reference)	84 (77.8)	24 (22.2)			
Treatment resistance (n=165)	No	94 (79.7)	24 (20.3)	0.75	0.34–1.65	0.47
	Yes (reference)	35 (74.5)	12 (25.5)			
Affective flattening (n=160)	None	12 (80.0)	3 (20.0)	1.67	0.32–8.59	0.54
	Mild	50 (86.2)	8 (13.8)	2.60	0.72–9.39	0.14
	Moderate	51 (72.9)	19 (27.1)	1.12	0.35–3.60	0.85
	Marked (reference)	12 (70.6)	5 (29.4)			
Depressive symptom count (n=165)	<5 symptoms	57 (73.1)	21 (26.9)	1.77	0.84–3.74	0.14
	≥5 symptoms (reference)	72 (82.8)	15 (17.2)			
Severity of current delusions ³ (n=144)	None	39 (83.0)	8 (17.0)	1.42	0.46–4.42	0.54
	Mild	21 (72.4)	8 (27.6)	0.77	0.24–2.47	0.66
	Moderate	30 (81.1)	7 (18.9)	1.25	0.39–4.06	0.71
	Marked (reference)	24 (77.4)	7 (22.6)			
Severity of current hallucinations ³ (n=141)	None	48 (85.7)	8 (14.3)	3.00	1.03–8.71	0.04
	Mild	23 (82.1)	5 (17.9)	2.30	0.67–7.86	0.18
	Moderate	19 (70.4)	8 (29.6)	1.19	0.39–3.65	0.76
	Marked (reference)	20 (66.7)	10 (33.3)			
Severity of current avolition ⁴ (n=141)	No/Mild	63 (78.8)	17 (21.2)	1.43	0.66–3.11	0.36
	Marked (reference)	44 (72.1)	17 (27.9)			
Severity of current alogia ⁵ (n=152)	No	37 (71.2)	15 (28.8)			
	Yes (reference)	81 (81.0)	19 (19.0)	1.73	0.79–3.77	0.17
Severity of current anhedonia ⁵ (n=92)	No	36 (75.0)	12 (25.0)			
	Yes (reference)	35 (79.5)	9 (20.5)	1.30	0.49–3.46	0.60

Note: Interest in employment is based on those not participating in the role in the previous 44 weeks. ¹See Table 2 for definitions of each variable. ²OR=Odds Ratios and were calculated with the ratio of the odds of being interested in the role by the odds of not being interested in the role divided by the reference group. ³Severity of current hallucinations and delusions were derived from the previous 30 days. ⁴Severity of current avolition was derived from the previous 30 days. To increase power due to small cell size, none and mild categories were collapsed and moderate and marked categories were collapsed. ⁵Derived from whether alogia or anhedonia was present in the previous 30 days. To increase power due to small cell size for alogia and anhedonia, mild, moderate and marked categories were collapsed. CI: confidence interval.

al, 2011). While employment interest may decline with age, this may be remedial, and with appropriate employment assistance need not translate into high unemployment among those aged 45 to 65 years.

Although educational attainment was not correlated with either participation in employment or interest in employment, the direction of the raw differences with respect to actual employment was in line with previous research (Waghorn et al, 2004; Waghorn et al, 2012). Interest in employment did not decline with less education: those with the greatest educational attainment were most interested in employment, but next most interested were those with the least educational attainment. This implies that while higher educational attainment is helpful in vocational rehabilitation, those with poor educational attainment should not be overlooked for vocational assistance.

Clinical correlates

The influence of severity of illness and the course of illness on employment was consistent with previous research. Those with minimal deterioration, or who had only had one episode of illness, were more likely to be employed than those with more severe deterioration or more continuous course of illness (Waghorn et al, 2002; Marwaha et al, 2007). The most noteworthy clinical finding was that none of the severity, course, or functioning variables had any impact on interest in employment. This is important because it implies that assistance may be needed to help people translate their interest in employment into positive competitive employment experiences. The lack of impact on interest is a promising finding, showing that those with more severe patterns of illness and more impaired functioning remain good candidates for vocational rehabilitation because their interest, and hence their motivation, may not be impaired.

Severity of current hallucinations was associated with both interest in employment and with actual employment participation. This was unexpected because previous research found weak or inconsistent relationships between positive symptoms and employment (Slade and Salkever, 2001; Tsang et al, 2010; Shamsi et al, 2011). However, previous studies did not use such specific measures of positive and negative symptoms, so it is possible that this is an important new result. If so, the implication is that hallucinations may be a stronger barrier than positive symptoms generally. Subsequently, clinicians could help by making these the focus of clinical treatment before referring the person to a vocational rehabilitation programme.

The absence of associations between negative symptoms and interest in employment, and with respect to actual employment, was unexpected. Previous studies suggest that negative symptoms have the greatest impact of all the clinical symptoms of schizophrenia

(Slade and Salkever, 2001; Hoffmann et al, 2003; Rosenheck et al, 2006). However, previous studies often used composite measures of negative symptoms, such as a total score on a negative syndrome scale, whereas this study examined more specific symptoms.

Of the negative symptoms, only avolition was significantly correlated with actual employment. This suggests that volition is important because action requires both the will to act generally, and motivation to initiate action towards gaining employment. Since interest precedes action, it is understandable that volition is associated with action but not with interest. For those with employment interest, but who lack volition, interventions aimed at developing volition may be needed as part of the vocational rehabilitation plan to counter the inertia and the passivity that this negative symptom can produce.

Limitations

The main limitation of this study is that the sample is close to, but not exactly representative of, community residents with schizophrenia and schizoaffective disorders. The sample was drawn from a larger, convenience sample recruited primarily for genetic analyses. All participants were of European Caucasian ethnicity, as other ethnicities were excluded from the original data collection for genetic homogeneity. In addition, compared to a national survey of psychosis (Waghorn et al, 2012), this sample included a higher proportion of those with more continuous and severe courses of illness. With these sampling limitations in mind, these results can inform future studies of community residents with schizophrenia and schizoaffective disorder.

Interest in employment is a new focal point for vocational rehabilitation research. To date, little is known about how it can be measured with optimal reliability and validity. A limitation of the current study may be that interest in employment was assessed by a single plain English question with unknown reliability and validity. Further investigations could show whether this is sufficient or not, and whether a brief composite measure of employment interest is needed.

Analyses were limited by numbers of participants relative to the number of variables being investigated, and the restricted range of some variables. This was taken into account by adopting an exploratory approach and by limiting the analysis to bivariate logistic regression. The data did not permit more sophisticated multivariable analysis. Consequently, there is a risk that some of the significant results are due to chance and that some of the non-significant results may prove significant in larger samples. Therefore, these results are best seen as informing directions for further studies of employment interest and employment as examples of role functioning,

rather than representing a final position on these relationships.

Finally, there are potential confounding relationships between some of the variables being investigated that warrant acknowledgement. Given that schizophrenia onset commonly occurs in late adolescence or early adulthood, the effect of schizophrenia on early employment is a complex relationship that can have implications for future employment that are difficult to elucidate. The identification of DSM-IV-TR depressive symptoms may also be confounded by the presence of negative symptoms of schizophrenia.

CONCLUSIONS

Demand for vocational rehabilitation is likely to be highest among interested younger people with schizophrenia who have an employment history. Interest in employment does not appear to decline with clinical severity as much as actual participation in employment can decline. Interest in employment among people with schizophrenia persisted in the majority throughout the working age.

The resilience of employment interest to the clinical symptoms of schizophrenia is a promising finding, indicating that those with more severe course patterns of illness and more impaired functioning can remain good candidates for vocational rehabilitation because interest and motivation for employment may not be affected. This implies that more vocational assistance could help people with schizophrenia translate their interest in employment into positive employment experiences. **IJTR**

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