BMJ Open

What are the clinical characteristics of disengaged (NEET) young people in primary mental health care?

Journal:	*BMJ Open*
Manuscript ID:	bmjopen-2014-006378
Article Type:	Research
Date Submitted by the Author:	15-Aug-2014
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Primary Subject Heading:	Mental health
Secondary Subject Heading:	Health services research
Keywords:	NEET, youth, unemployment, role functioning, clinical stage

Title: ***What are the clinical characteristics of disengaged (NEET) young people in primary mental health care?***

Running title: NEET status among help-seeking young adults

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KEYWORDS

NEET, youth, unemployment, role functioning, clinical stage

ABSTRACT

Objective: Youth with mental health problems often have difficulties engaging in education and employment. In Australia, youth mental health services have been widely established with a key aim of improving role functioning; however, there is little knowledge of those who are not engaged in employment, education or training (NEET) and the factors which may influence this. This study aimed to examine NEET status and its correlates in a sample of such youth.

Design: Cross-sectional data from a longitudinal cohort study.

Setting: Between January 2011 and August 2012, young people presenting to one of four primary mental health centres in Sydney or Melbourne were invited to participate.

Participants: Young adults (N = 696) aged between 15 – 25 years (M: 19.0, SD: 2.8), 68% female, 58% (n = 404) attended *headspace* Sydney.

Measures: Individuals 'Not in any type of Education, Employment or Training' in the past month were categorised as NEET. Demographic, psychological and clinical factors alongside disability and functioning were assessed using clinical interview and self-report.

Results: A total of 19% (130/696) were NEET. NEETs were more likely to be male, older, have a history of criminal charges, risky cannabis use, higher level of depression, poorer social functioning, greater disability and economic hardship, and a more advanced stage of mental illness than those engaged in education, training or work. Gender was found to moderate the association between NEET status and depression. Demographics such as post-secondary education, immigrant background and indigenous background, were not significantly associated with NEET status in this sample.

Conclusions: One in five young people seeking help for mental health problems were not in any form of education, employment and training. The commonly observed risk factors did not appear to influence this association, instead, behavioural factors such as criminal offending and cannabis use appeared to require targeted intervention.

ARTICLE SUMMARY

Strengths and limitations of this study

- This study is one of the first to examine the prevalence of NEET status in young Australians seeking help for mental health problems. It highlights that NEET rates in such youth (19%) are higher than that found in general population studies of Australian youth (11%).
- This study identified that NEET youth are more likely to be older males with a history of criminal offending as well as risky cannabis use. Not surprisingly, NEET youth reported greater levels of economic disadvantage and poorer social and occupational functioning. NEET youth were also more likely to have higher levels of depression and be in a more advanced stage of mental illness.
- Although this study is a cross-sectional cohort analysis, it exemplifies that 1 in 5 young people presenting to mental health services are likely to be NEET. Furthermore, previously identified demographic associations were not significantly associated with NEET status in this sample. Instead, behavioural factors such as criminal offending and cannabis use appear to require targeted interventions if the aim is to restore role functioning.
- This study was only able to identify 13% of the variance in NEET status. This strongly suggests that there are a range of other important factors that need to be investigated before NEET status is fully understood in this vulnerable group.

BACKGROUND

Participating in education and employment is considered key to the transition to successful adult wellbeing. Employment and education provides both manifest (e.g. income) and latent (e.g. time structure, social contact, sharing of common goals, status and activity, social and occupational support) benefits to an individual [1]. Individuals with low educational attainment and/or limited employment experience a greater likelihood of social exclusion [2], disability and isolation, in addition to the impacts of low income: poorer quality of life, more illness and disease [3], decreased access to healthcare, increased levels of psychological distress, and maladaptive lifestyle behaviors such as substance misuse [4-6] and criminal activity [7]. Chronic unemployment is associated with severe levels of disadvantage and carries a significant economic cost to both the individual and society including lost earnings and taxes, as well as the increased burden on welfare and healthcare systems [8].

Adolescence and early adulthood is a crucial period in which skill development and social roles are initiated. Young people who are 'Not in Education, Employment or Training' (NEET) [5] are important to clinicians, policy makers and researchers as this signifies an absolute disengagement from both the labour market and a major avenue of human development. Currently, the large majority of NEET statistics are compiled by the Organisation for Economic Co-operation and Development (OECD) who provide annual comparisons of NEET rates among general youth populations in different countries. Since the onset of the global financial crisis (mid 2007), NEET rates among young people have increased considerably [9]. In 2011, the NEET rate among Australian youth was 11% [10]: higher than the rate for the Netherlands and Denmark (approx. 5%) but lower than those countries heavily affected by the financial crisis, such as Greece and Spain (approx. 18%) and those outside the European Union e.g. Israel and Turkey (approx. 30%). While the direct causal path for NEET status has not yet been determined, longitudinal studies conducted in the United Kingdom have demonstrated that NEET status at the age of 16 years predicts NEET status at the age of 18 years [11] and is a strong predictor of chronic unemployment in adulthood [12 13]. However, the precise risk factors and trajectories of NEET status in young people remain unclear.

In population studies, certain traits are overrepresented among NEET youth. The key correlates identified to date tend to be demographic and social factors; specifically, socio-economic status, ethnic and immigration background,

parental factors (e.g., occupation, educational attainment, divorce, parental unemployment), living arrangements (e.g. not living with either parent, homelessness), negative school experiences (e.g., low educational attainment, bullying, persistent truancy, expulsion and suspension, conduct and behavioral problems, learning difficulties) and crime [14-16]. Additionally, the likelihood of being NEET increases with age and is reported as being more common among females [10 17], although some samples report higher rates among males [16]. These risk factors are derived from routinely collected information in social insurance and census databases to determine NEET status. In most cases, very little attention is paid to health or disability factors. Given that mental ill health is the primary cause of disability amongst people in OECD countries (Merikangas et al., 2009; Hickie et al., 2001) addressing NEET status among young people with mental illness is a key concern [18].

Importantly, young people often exhibit substantial levels of disability prior to the complete manifestation of a mental disorder, reflecting either the putative prodrome of an illness [19 20] or the consequence of disengagement from employment and education [21]. A range of youth focused services, such as *headspace* in Australia, have been established to improve clinical outcomes; however, these services were also predicated upon the notion that investment in early treatment and selective prevention would produce long term socioeconomic savings [22]. The National Mental Health Commission (2013) recommended that improving social participation should also be a key outcome of such services, suggesting that clinical care must now focus on improvements beyond symptomatology. Currently, most knowledge about improving social functioning in this area is derived from studies of those with early psychosis and severe mental illness (e.g. IPS: Individual Placement and Support for early psychosis) [23]; however, the large majority of youth presenting to *headspace* experience chronic or recurrent mood, anxiety and substance abuse disorders [18]. In order to best target current and future primary health services, it is important to understand the risk profile of NEET among young people who are seeking help from these services. Such knowledge might help improve service delivery, providing opportunities for the services to intervene in the other life domains, such as employment and training, which are negatively affected by mental illness.

This study aimed to explore the prevalence of NEET status in a cross-section of young adults seeking help at a primary mental healthcare service. We wished to determine which non-clinical and clinical factors were associated with being NEET. Given that male and female youth often present with different symptom and behavioural profiles

[20], this study also aimed to determine whether the associations with NEET status were moderated by gender. By attempting to profile those who are NEET, treatment and prevention strategies can be modified accordingly.

METHOD

Sample

Between January 2011 and August 2012, all young people aged between 12 – 25 years who presented to one of four *headspace* clinics in Sydney and Melbourne (with varied demographic catchment areas) were approached for participation in a longitudinal cohort study evaluating the course of psychiatric disorders among young people, described in full elsewhere [24]. Established by the Australian Government in 2006, *headspace* centres provide youth-focused mental health and general health services, drug and alcohol services, and vocational assistance to young people aged 12–25 years. There is direct access with no need for a clinician referral and no specific catchment area. There are currently 55 centres located nationally, the four in this study being amongst the first established. The most common reasons for attendance at *headspace* are mental health problems, primarily anxiety and depressive symptoms, often in the context of psychosocial issues such as relationship conflict with family and peers [25]. As *headspace* focuses on both youth mental health and early intervention, young people may present for care with varying illness severity (e.g. from sub threshold symptoms to chronic disorders, mild to severely impaired social functioning) across a range of mental health problems [20]. Individuals with a clinician-determined intellectual disability, acute suicidality or those without fluent English were not invited to participate. A total of eight hundred and two participants were recruited. To ensure consistency with OECD descriptions of NEET status [26] and compulsory education age in Australia, participants aged below 15 years (n =106) were excluded from this study (Final N = 696).

Procedure

After the individual's initial clinical assessment, consenting participants were contacted by a research assistant (RA) via telephone or in person to discuss the nature and aims of the research. Participants provided written informed consent. Participants were assessed by RAs who held graduate degrees in psychology using a structured interview consisting of the clinical measures outlined below. RAs were trained in the use of the structured interview and achieved an inter-rater reliability score of at least 0.8 on each of the interviewer-rated clinical measures before

recruitment commenced. After the interview each participant was provided an iPad or laptop for the completion of the self-report measures. This process took approximately 1 – 2 hours to complete. Participants received a $20 gift voucher for reimbursement.

Measures

Not in Education, Employment or Training (NEET) status

Using questions from the Australian Bureau of Statistics (ABS) 2006 Census [27] participants reported if they were currently in any education, training or employment (yes/no) and how many hours per week they participated. Participants were also asked whether they had worked for payment or profit in the past month to which answers were given as: a) worked full time b) worked part-time c) did not have a job for which I received payment. To capture those who had completely disengaged from education and employment, individuals reporting that they were 'Not in any type of Education, Employment or Training in the past month' were categorised as NEET, regardless of their volunteering roles, caring roles or parenting roles.

Demographics

Participants' age, gender, immigration background, post-secondary education, indigenous background, economic hardship, criminal charges, and government assistance were assessed using self-report. To allow for comparison with other national and international NEET data, age was dichotomised: 15 – 19 years *vs*. 20 – 25 years. *Immigration background:* participants not born in Australia or those with one or both parents born overseas were classified as being of an 'immigrant background'. *Post-secondary education:* achieved by participants (none *vs*. trade, apprenticeship, certificate, diploma, university degree). *Indigenous background:* those who identified as being Aboriginal, Torres Strait Islander, or Maori. *Economic hardship:* ABS questions assessing a reported inability of an individual or their family to pay a household expense, or the deployment of dissaving behaviour such as borrowing money to do so in the previous three months. *Criminal charges:* participants reported the number and nature (e.g. assault, property damage, theft/burglary, drug use/manufacture/possession, other) of criminal charges they had ever faced by the police. *Government benefits:* participants were asked to report whether they had received any government benefits in the past three months (e.g. Youth Allowance, Disability Support Pension, Newstart,

Other). *Location of service:* The location of the *headspace* service attended by participants was recorded by administration and categorised as either 'Sydney, NSW' or 'Melbourne, Victoria.

Psychological and clinical risk factors

Substance misuse: participants' alcohol, cannabis and tobacco misuse were assessed in the clinician interview using the WHO Alcohol, Smoking and Substance Involvement Screening Test (WHO-ASSIST) [28] which provides a category of risk for a range of drugs including tobacco, alcohol and cannabis based on items 2,- 7. For cannabis and tobacco, substance involvement scores greater than 3 indicated 'at risk' participants and for alcohol, scores greater than 10. 'At risk' of misuse individuals are at risk of, or already are, experiencing health, social, financial, legal and relationship problems resulting from their substance use, and the possibility of dependence. *Childhood Onset Disorder:* participants' recall of a prior diagnosis of a disorder in childhood such as hyperactivity, autism, attention deficit disorder or conduct disorder. *Depressive symptoms:* assessed using the clinician rated Quick Inventory of Depressive Symptomatology (QIDS-C_{16}) [29] which examined the presence, during the previous seven days, of the major DSM-IV diagnostic symptoms of depression rated on a 4-point Likert scale, combined to provide total scores ranging 0 – 27. *Anxiety* was assessed by self-report using the Generalised Anxiety Disorder (GAD-7) questionnaire [30]. *Clinical Stage:* was operationalised as a clinician-rated indicator of the severity and chronicity of mental illness experienced by participants. In accordance with the criteria established by the clinical staging model [31], participants were classified as either 'Stage 1' (non-specific symptoms or attenuated syndrome) or 'Stage 2+' (first episode of discrete disorder or persistent, recurrent mental illness). Participants' level of social and neurocognitive functioning are also considered when determining clinical stage. Staging decisions were based upon the results of the clinical interview with any discrepancies resolved in consensus meetings with research assistants and clinical supervisors.

Functioning measures

Disability: using the 12 item self-report WHODAS12 questionnaire [32], participants self-rated their difficulty performing daily life activities during the past 30 days. Global scaled scores range from 0–48 with higher scores indicating a moderate to severe level of disability. *Social and Occupational Functioning:* assessed by the interviewer using the clinician-rated Social and Occupational Functioning Assessment Scale (SOFAS) which

allocated an overall functioning score ranging between 0–100, with higher score suggesting a superior level of functioning.

Analysis

This investigation used cross-sectional baseline data from a longitudinal cohort study. All statistical analyses were conducted in SPSS Version 22. Group differences between NEET and non-NEET participants were assessed using *t*-tests and simple logistic regressions for categorical variables. Levene's tests for equal variances were conducted for the continuous variables, for which none violated any assumptions. Due to the number of univariate analyses conducted, an alpha correction using the Bonferroni method was made: the adjusted alpha level for statistical significance was determined to be $p < .003$. Only variables achieving significance at this level were included in the multivariate analysis. To examine the independent associations of NEET status, a hierarchical logistic regression was conducted: NEET status was entered as the dichotomous dependent variable. Some measures were not included in the multivariate analyses due to the circularity with NEET status (e.g. economic hardship, clinical stage, self-reported disability, and level of social and occupational functioning). All variables that were significant in the univariate analyses were entered into the first model of the regression. The interaction terms for gender were subsequently added in the second model. Continuous variables were centered before interaction terms were created and only centered variables are included in the multivariate analyses. Only models with non-significant Hosmer-Lemeshow goodness-of-fit tests were included.

Ethics

Ethics was granted by the Human Research Ethics Committees at the University of Melbourne and the University of Sydney.

RESULTS

Participants

In this sample of help-seeking young adults ($N = 696$, M_{age}19 years, SD: 2.8, age range: 15 – 25 years, 68% female), 58% ($n = 404$) attended *headspace* Sydney, 42% ($n = 291$) had one or both parents born overseas; 19% ($n = 129$)

had a post-secondary education; 4% (*n* = 28) were Indigenous; 32% (*n* = 226) experienced economic hardship, and 17% (*n* = 117) reported one or more instances of perceived discrimination. A total of 70 participants (10%) had a history of criminal offending with 132 counts of crime reported: 36% (47) theft/burglary, 19% (25) were physical assault, 16% (21) property damage, 14% (19) were drug related, 15% (20) were 'other'. In the current sample, 19% (*n* = 133*)* were classified as at risk for alcohol, 50% (*n* = 346) for tobacco and 29% (*n* = 199) for cannabis. The mean symptom and functioning scores were: depression (QUIDS) 10.44 (SD: 5.34, range 0 – 26), anxiety (GAD) 10.10 (SD: 5.95, range 0 – 21), self-rated disability (WHODAS) 13.25 (SD: 9.39, range 0 – 47) and SOFAS 65.33 (SD: 11.61, range 30 – 95) with 13% (*n* = 91) reporting a child onset disorder and 13% (*n* = 93) classified as Clinical Stage 2+.

NEET status

A total of 19% (*n* = 130/679) of participants were classified as 'Not engaged in any Employment, Education or Training' (NEET). Among these, 68% (*n* = 88/130) had received some form of government assistance in the past three months: 26% (*n* = 34) received youth allowance, 25% (*n* = 32) received unemployed/job seekers allowance, 11% (*n* = 14) received the disability support pension, 8% (*n* = 7) received a parenting payment and one participant reported receiving 'other'. NEETs were more likely to be male and aged between 20 – 25 years (see Table 1). NEETs had higher symptom levels of depression, but not anxiety, and were more likely to be in a progressed stage of mental illness (Clinical Stage 2). NEETS reported higher levels of disability, lower levels of social and occupational functioning and higher rates of economic hardship (Table 1). NEETs were also more likely to have a history of criminal charges and risky cannabis use (but not alcohol or tobacco) than non-NEETs. Notably, NEET status was not associated with state location of centre, immigrant background, post-secondary education or indigenous background. In the multivariate analysis (Table 2), older age (20 – 25 years), gender (male), a history of criminal charges, cannabis risk and depression were independently associated with NEET status. This model accounted for 11% of the variance in NEET status. On the addition of the interaction terms in Model 2, gender was found to moderate the association between depression and NEET status. This association was stronger among males (OR: 2.20) compared to females (OR: 1.93). All of the associations from Model 1 remained significant with cannabis use emerging as significant; however, the final model only accounted for a further 2% of variance in NEET status.

DISCUSSION

In this sample of young adults with mental health problems, nearly one in five (19%) were not engaged in any education, employment or training. This rate is nearly twice that found among the general population of youth aged 15 – 24 years living in Australia (11%, OECD 2011). In the current study, those categorised as NEET had higher symptom levels of depression and a more advanced stage of mental illness: NEETs were more likely to be male, older, have a history of criminal charges and risky cannabis use. Not surprisingly, NEET participants had lower levels of social and occupational functioning, higher levels of disability and experienced greater economic hardship compared to non-NEETs. Interestingly, demographic factors commonly found to be associated with NEET status in routine population statistics [6] such as post-secondary education, immigration background, indigenous background were not significantly associated with NEET status in this sample. This suggests that although such factors may be important for young adults with reasonable mental health, these factors are less important in this restricted sample. Alternatively, mental ill-health and substance abuse may mediate or confound the impact of these demographic risks. Overall, the results find that young adults with mental health problems, particularly older males, are at high risk of being NEET and may experience a level of vocational and educational disability that is on par with some of the most disadvantaged OECD nations in the world [5].

In the current study, males were more likely to be NEET than females. This is somewhat inconsistent with OECD data which generally reports a higher prevalence of NEET status among women [10 17 26]. We suspect that this is related to the nature of the data used to ascertain NEET status on a population level by OECD countries. More often than not, NEET status includes those who partake in care giving roles such as full-time parenting. As females tend to adopt such roles in most countries, it is difficult to determine which gender is truly disengaged from a meaningful role. In countries which do account for this (e.g. Scandinavia), sex differences in NEET status are either not as profound, or are more common in men [17]. Furthermore, longitudinal cohorts from the United Kingdom [11] consistently report a higher likelihood of males being NEET. This highlights the current difficulties in comparing NEET rates and supports the need for a more cohesive approach to examining NEET status.

Of the symptom factors, depression was significantly associated with NEET status and more so in males. The main association is not surprising as depressed individuals report greater restlessness, trouble concentrating and a failure to consider or plan for the future [33]. Those with depression often withdraw from social activities and relationships, decreasing the size of their social networks and severing relationships which may offer support and enhance occupational functioning. Conversely being disengaged is also likely to lead to worse mood. The significant gender interaction may indicate that NEET status exacerbates depression more strongly in men, or alternatively, that depression alone has a greater impact on male occupational functioning compared to females [34]. Depressed males are more likely to be rejected by their peers than depressed females, further isolating these men from the advantages of social interaction [35]. However, the current finding may reflect a sample bias: mental health services such as *headspace* may be capturing those male NEETs who are experiencing depressive symptoms rather than those who are not.

Criminal offending and cannabis use were significantly associated with NEET status. The latter is not surprising as substance use often emerges as a risk factor for both poorer functioning and clinical symptoms in studies of youth [36-38]. As demonstrated by the current study, cannabis use may place young adults at greater risk of becoming NEET, although a trend also appears for tobacco use. As poor physical health is associated with these substances, youth focused health services must seriously account for the impact of substance use on treatment outcomes and role functioning. Innovative treatment approaches are needed as many young adults are reluctant to engage in interventions for substance use. Given the widely published link between youth unemployment and crime [39], the association between criminal offending and NEET status were also not unexpected. The precise direction of causality between these variables cannot be determined by the current study: whether criminal offending is a consequence of economic hardship (as a number of criminal offenses were for theft) [40], or representative of greater social adversity or other underlying personality traits, is unknown. Regardless, these results signify that such behavior limits the capacity for role functioning in young adults. These findings suggest that if the aim of services like *headspace* is to increase role functioning in young adults with mental health problems, simply focusing on ameliorating symptoms, predominantly anxiety and depression, may not be the best approach [22].

Limitations

This study is based on a cross-sectional sample of self-selected, help-seeking young adults with mental health problems. The findings may be limited by such selection bias although the overall level of NEET status and the gender differences in the sample are similar to those reported in the national *headspace* dataset [25]. The current study did not include a control group and as such, no comparisons can be made to youth without mental health concerns or those not seeking help. Whilst parenting or caring roles were not separated from NEET status in the current study, 14 participants (7 of which were NEET) received a parental payment from the government, suggesting that 2% of the total sample were parents. As females are more likely than males to adopt caring roles in the absence of education, employment or training, [11] future investigation may benefit from focusing on the nature of such responsibilities within similar samples of NEETs. Importantly, different associations for NEET status may be found among young adults who present to other services (e.g. justice and criminal systems) and among samples that are more culturally and ethnically diverse. As the final regression model only accounted for 13% of the variance in NEET status, a range of other factors need to be considered including cognitive impairment [41] and occupational aspirations [42]. Future research would benefit from determining the range of other factors, both clinical and non-clinical, including the economic environment that may be related to NEET status in young adults with mental health concerns. Research with a longitudinal focus would help untangle the direction of causality and outline the trajectories of NEET status in youth.

Conclusions

This study confirms that among young adults with mental health problems, NEET status is highly prevalent [18]. The factors identified in this study suggest that when designing clinical or policy initiatives to improve role functioning among youth with mental health problems it is necessary to consider a range of clinical and non-clinical factors. Traditional clinical approaches which focus on symptoms may need to be augmented and tailored in help-seeking young adults. Multidisciplinary approaches to offending behavior and substance use are also required. Furthermore, it appears that males with mental health concerns are at considerable risk of being NEET and that *headspace* appears to be capturing these men at a later age, in a more progressed stage of mental illness and experiencing greater social dysfunction when compared to females [25]. Collaborative and integrated service centers such as *headspace* are more likely to be effective in achieving their policy objectives in the functional and economic domains by further understanding the groups most at risk and allocating resources appropriately. However, the high

proportion of youth presenting as NEET suggests that these “early intervention services” are, in many cases, not “early” enough.

Table 1. Univariate associations with NEET status among young adults seeking help for mental health problems (*n* = 679)

	NEET *n* = 130 (19%)	Non-NEET *n* = 549 (81%)		
	n (%)	*n* (%)	OR (95% CI)	*p*
Sydney	75 (58%)	314 (57%)	1.02 (0.69 – 1.50)	.92
20 – 25 years	77 (59%)	206 (30%)	2.42 (1.64 – 3.57)	**.000**
Male	62 (48%)	159 (29%)	2.24 (1.51 – 3.31)	**.000**
Immigrant background	58 (45%)	233 (42%)	1.09 (0.74 – 1.61)	.65
Indigenous background	6 (5%)	22 (4%)	1.16 (0.46 – 2.92)	.75
Criminal charges	26 (20%)	44 (8%)	2.85 (1.68 – 4.83)	**.000**
Post-secondary education	22 (17%)	107 (19%)	0.84 (0.51 – 1.39)	.50
Economic hardship	54 (42%)	172 (31%)	2.15 (1.37 – 3.39)	**.001**
Perceived discrimination	29 (22%)	88 (16%)	1.94 (1.11 – 3.38)	.02
Alcohol risk	30 (23%)	100 (18%)	1.37 (0.86 – 2.17)	.19
Tobacco risk	74 (57%)	262 (48%)	1.46 (0.99 – 2.16)	.05
Cannabis risk	50 (38%)	139 (25%)	1.94 (1.29 – 2.90)	**.001**
Child onset disorder	27 (21%)	62 (11%)	2.06 (1.24 – 3.40)	.01
Clinical stage 2+	35 (27%)	56 (10%)	3.20 (1.99 – 5.16)	**.000**
	M (SD)	M (SD)	MD (95% CI)	*p*
Anxiety score	11.35 (6.16)	9.81 (5.87)	1.54 (0.41 – 2.68)	.01
Depression score	12.62 (5.56)	9.89 (5.10)	2.72 (1.73 – 3.72)	**.000**
Self-rated disability	16.19 (9.94)	12.55 (9.12)	3.65 (1.86 – 5.43)	**.000**
SOFAS	56.14 (10.40)	67.67 (10.80)	-11.53 (-13.59 – -9.48)	**.000**

Note. **Bold =** $p < .003$. OR = Odds Ratio, CI = Confidence Interval, SOFAS: Social and Occupational Functioning Assessment Scale (range 0 - 100).

Table 2: Multivariate associations with NEET status among young adults seeking help for mental health problems (*n* = 637)

	Base model C-S $R^2 = 0.11^*$				+ Gender interaction terms C-S $R^2 = 0.13^*$			
	B (SE)	OR	95% CI	*p*	*B(SE)*	OR	95% CI	*p*
Male	0.90 (0.22)	2.47	1.60 – 3.82	**.000**	1.52 (0.37)	4.56	2.19 – 9.48	**.000**
Age 20 – 25 years	0.86 (0.21)	2.36	1.55 – 3.59	**.000**	1.15 (0.29)	3.16	1.79 – 5.56	**.000**
Criminal charges	0.78 (0.30)	2.19	1.21 – 3.95	**.009**	1.36 (0.44)	3.91	1.66 – 9.20	**.002**
Cannabis risk	0.39 (0.23)	1.48	0.95 – 2.30	.082	0.68 (0.30)	1.97	1.10 – 3.53	**.023**
Depression score	0.11(0.02)	1.12	1.07 – 1.16	**.000**	0.71 (0.44)	1.07	1.02 – 1.13	**.007**
Age group*gender					-0.56 (0.60)	0.57	0.24 – 1.35	.200
Criminal charges*gender					-1.06 (0.47)	0.35	0.11 – 1.13	.079
Cannabis risk*gender					-0.70 (0.47)	0.50	0.20 – 1.24	.133
Depression*gender					0.10 (0.04)	1.11	1.02 – 1.20	**.021**

Note: * $p < .001$ **bold** = $p < .05$. Base Model: Nag $R^2 = 0.18$, -2LL: 567.90, Model χ^2 (5) = 79.85, $p < .001$, Step 2 (+ Gender Interaction Terms): Nag $R^2 = 0.21$, -2LL: 554.22, Model χ^2 (9) = 93.54, $p < .001$, $\Delta\chi^2$ (4) = 13.69, $p < .01$.

Contributorship Statement: The study was designed and conducted by PM, IH, NG, DH, RP, EK, AY, AG, ES. The analysis of data and interpretation was conducted by BOD, KLF, NG. The paper was prepared by BOD, NG, and KLF and critically revised by PM, IH, JS, DH, RP, EK, AY, ES, AG, JB. The other investigators on the Transitions Study were A. Jorm, E. Killackey, L. Phillips, S.W. Wood, A. Mackinnon, E. Scott, A. Yung, A. Kenyon, L. Mundy, A. Nichles, A, Scaffidi, D. Spiliotacopoulos, L. Taylor, J.P.Y Tong, S. Wiltink, N. Zmicerevska, and A. Guastella. This study was conducted at Brain and Mind Research Institute, University of Sydney and Orygen Youth Health Research Centre, Melbourne.

Competing Interests: Professor Hickie is a Board Member of Psychosis Australia Trust. From 2012, he has been a Commissioner in Australia's new National Mental Health Commission. He was until January 2012 a director of headspace: the national youth mental health foundation. Prof Hickie was previously chief executive officer (till 2003) and clinical adviser (till 2006) of beyondblue, an Australian National Depression Initiative. He is supported principally for clinical research in depression and health services and population health initiatives related to anxiety and depression by an NHMRC Australian Medical Research Fellowship (2007–12) and now by an NHMRC Senior Principal Research Fellowship (2013-17). He has led projects for health professionals and the community supported by governmental, community agency and pharmaceutical industry partners (Wyeth, Eli Lily, Servier, Pfizer, AstraZeneca) for the identification and management of depression and anxiety. He has received honoraria for presentations of his own work at educational seminars supported by a number of nongovernment organisations and the pharmaceutical industry (including Pfizer, Servier and Astra Zeneca). He has served on advisory boards convened by the pharmaceutical industry in relation to specific antidepressants, including nefazodone, duloxetine, and desvenlafaxine. He leads an investigator-initiated study of the effects of agomelatine on circadian parameters (supported in part by Servier but also by other NHMRC funding) and has participated in a multicentre clinical trial of agomelatine effects on sleep architecture in depression and a Servier-supported study of major depression and sleep disturbance in primary care settings. In addition to national and international Government-based grant bodies, investigator-initiated mental health research at the BMRI he has been supported by various pharmaceutical manufacturers (including Servier and Pfizer) and not-for-profit entities (including the Heart Foundation, beyondblue and the BUPA Foundation). All other authors declare no conflicting interests.

Funding: The study was supported by an NHMRC Program Grant (ID: 566529).

Data sharing: The dataset for this study is not currently publically available; however, all statistical code can be reviewed by contacting the corresponding author bridianne.odea@sydney.edu.au

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Early Intervention in Psychiatry 2013; ••: ••–••
doi:10.1111/eip.12079

Original Article

Transitions Study of predictors of illness progression in young people with mental ill health: study methodology

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Received 27 November 2012; accepted 9 June 2013

Abstract

Aim: An estimated 75% of mental disorders begin before the age of 24 and approximately 25% of 13–24-year-olds are affected by mental disorders at any one time. To better understand and ideally prevent the onset of post-pubertal mental disorders, a clinical staging model has been proposed that provides a longitudinal perspective of illness development. This heuristic model takes account of the differential effects of both genetic and environmental risk factors, as well as markers relevant to the stage of illness, course or prognosis. The aim of the Transitions Study is to test empirically the assumptions that underpin the clinical staging model. Additionally, it will permit investigation of a range of psychological, social and genetic markers in terms of their capacity to define current clinical stage or predict transition from less severe or enduring to more severe and persistent stages of mental disorder.

Method: This paper describes the study methodology, which involves a longitudinal cohort design implemented within four *headspace* youth mental health services in Australia. Participants are young people aged 12–25 years who have sought help at *headspace* and consented to complete a comprehensive assessment of clinical state and psychosocial risk factors. A total of 802 young people (66% female) completed baseline assessments. Annual follow-up assessments have commenced.

Conclusions: The results of this study may have implications for the way mental disorders are diagnosed and treated, and progress our understanding of the pathophysiologies of complex mental disorders by identifying genetic or psychosocial markers of illness stage or progression.

Key words: anxiety, clinical staging, depression, youth mental health.

INTRODUCTION

Mental ill health is the dominant health issue facing young people in the developed world. The incidence and prevalence of mental ill health in adolescents and young adults is well documented[1] and is the highest of any age group.[2,3] The National Comorbidity Survey Replication indicated that 75% of people with a psychiatric disorder experienced onset by 24 years of age, with the onset of most adult forms of mental disorder falling within a narrow time band from the early teens to the mid-twenties and peaking in the early twenties.[4] This pattern of onset led Insel and Fenton[1] to propose that mental disorders be considered the 'chronic diseases of the young'.

The clinical profile of mental ill health in young people post-puberty is characterized by mixed symptom patterns, often comorbid with substance misuse.[2,5,6] Most likely, these phenotypes reflect the early manifestation of illness, in which undifferentiated or brief 'sub-syndromal' symptoms emerge

before any more distinct, prolonged or diagnosable disorder (e.g. see[7]). Young people with undifferentiated clinical syndromes or emerging mental disorders experience particular difficulties accessing treatment.[8] This occurs for a number of reasons, including the emphasis in current treatment paradigms on the primacy of formal *diagnosis* (both at the service and individual level), which marginalizes or excludes young people with sub-threshold or brief symptoms.[8,9] As young people experience mixed symptom patterns that do not neatly align with current diagnostic systems, often remit but recur, and which may or may not ultimately develop into discrete mental disorders, there is a need to develop an alternative approach to conceptualizing these problems. A clinical staging model of mental disorders may offer a way forward to develop a more appropriate clinicopathological framework for the emergence and progression of mental disorders.[10–12]

Clinical staging is an adjunct to other more formal diagnostic systems. On its own, it does not seek to replace all other systems. It differs from conventional (i.e. categorical) diagnostic practice in that it defines the extent of progression of a disease or illness at a particular point in time; that is, where a person lies along the continuum of the course of illness. The utility of clinical staging is most pronounced for any disease or illness that *tends* to progress, which *may* progress or where persistence or progression results in other major or secondary complications. The differentiation of early, brief or milder clinical phenomena from those that accompany illness progression, persistence and chronicity lies at the heart of the concept, which makes it especially useful in young people.[10,13] It is crucial to allow the inclusion of young people that experience transient mental ill health. Although from a formal diagnosis perspective, these may ultimately be considered 'false positives' or 'phenocopies' of the early stages of persistent or complex disorders, these young people still have important immediate health care needs and accompanying disability.[6,14]

The clinical staging model provides a longitudinal perspective relevant to the evolution of illness from an at-risk (i.e. no symptoms), through sub-threshold states through to differentiated illness, and takes account of risk factors and/or markers relevant to the illness, its course and prognosis. We have extended the original model, which focused on the most severe (psychotic or mood) disorders, to hypothesize that a broader range of mental disorders (potentially including bipolar disorder, anxiety disorders with major avoidance, eating disorders and substance dependence) develop from initial non-specific symptoms and syndromes (i.e. a 'pluripotential state'). This may also reflect a background of specific and non-specific risk factors, including genetic and early environment risks. From the initial non-specific clinical presentation, worsening of symptoms and acquisition of new symptoms occurs, together with progressive neurobiological changes and related neurobehavioural deficits, until distinguishable mental disorders appear. That is, the natural history of major mental disorders such as mood, anxiety and psychotic disorders is theorized to consist of *transitions* from being asymptomatic (stage 0), through a stage of undifferentiated general symptoms such as mild anxiety, depressive and/or somatic symptoms (stage 1a), to a worsening of existing symptoms (or the acquisition of new symptoms), whereby the person appears to have an attenuated form of a distinguishable mental disorder (stage 1b), until eventually (at least for some) a 'threshold diagnosis' is reached (stage 2; such as mania, severe depression or schizophreniform disorder). After such diagnosis, progression of illness may still occur, with development of chronic symptoms, a pattern of relapses and ongoing functional decline.

Within this model, we propose that transition from one stage of illness to the next is not inevitable. For example, a person with mild anxiety and depressive symptoms may or may not progress to develop a severe depressive or bipolar disorder, just as a person with a first episode of psychosis may or may not progress to a chronic, deteriorating illness. At any one time, there may be a number of possible trajectories. One of the implications of conceptualizing mental disorders this way is that it guides the search for risk factors for transition and progression, or conversely remission and recovery. These risk factors could be underlying risk indicators and/or trait markers, such as genetic markers, brain abnormalities, peripheral biomarkers or abnormal early environment and experiences (e.g. trauma, poor parental bonding). The benefit of identifying these markers is that they may be relevant to differentiating between disorders. However, a challenge in doing this is the ability to distinguish risk indicators from state markers, which will vary depending on a person's current mental state and where they lie on the continuum of progression of illness. For example, further research is needed to determine if social cognitive deficits seen in some young people with early psychosis are due to their symptomatology at the time (i.e. state (or a consequence of the illness) markers)

or are an underlying indicator of a disease (a trait marker).

The clinical staging model articulated above is heuristic and requires evaluation and elaboration. It is recognized that the proposed clinical stages and thresholds between any proposed stages may not be valid or accurate, and therefore require robust empirical examination. Furthermore, although there is compelling evidence for focusing on potential trait and state markers and modifiable risk factors for the development of mental illness (e.g. childhood trauma, family history of mental illness, neuroticism, social support, treatment non-response), their validity and relationship to different stages of illness is yet to be well established. We designed a study (the Transitions Study) to:

1 Establish a cohort of young people who have sought help for mental health problems and longitudinally investigate this cohort to test a clinical staging model of the development and progression of mental disorders; and
2 To test the validity of a range of markers (clinical, psychological, social and genetic), both in terms of their capacity to:
   i Define current clinical stage, and
   ii Predict transition between stages of mental ill health in young people. In particular, to determine which variables are vulnerability markers, which are modifiable risk factors, which are consequences of disease and which are epiphenomena.

Specifically, we hypothesized that:

1 There is a dimensional 'pluripotential' state of psychological distress that can evolve into a range of more specific clinical syndromes, including severe depression, mania, psychosis, anxiety with major avoidance and substance dependence.
2 The pluripotential state and the specific syndromes can be differentiated on a range of factors, including symptoms, disability and patterns of neuropsychological impairment.
3 There are general factors that predict risk for the pluripotential state of psychological distress, including neuroticism, adverse life events, childhood adversity, social disadvantage and lack of social support.
4 There are specific factors that differentially predict transition from the pluripotential state to each of the specific clinical syndromes, including attenuated symptoms of the specific syndrome and patterns of neuropsychological impairment.
5 There are general factors that predict remission from the pluripotential state (e.g. resolution of life events, receiving social support, treatments that reduce distress) and specific factors that predict remission from the clinical syndromes (including receiving syndrome-specific interventions).
6 Young people who remit from a specific syndrome will tend to have recurrences within the same syndrome. In contrast, young people who remit from the pluripotential state will continue to be at broad/general risk for a range of specific syndromes.

This paper describes the Transitions Study methodology.

METHOD

Sample

Potential participants were young people aged 12 to 25 years (inclusive) who sought help from one of four *headspace* clinical services in Melbourne and Sydney, Australia between January 2011 and August 2012. *headspace* was established by the Australian Federal Government in 2006 to promote and support early intervention for young people with mental health and substance use disorders. *headspace* services provide youth-focused mental and general health services (e.g. sexual health consultations), as well as alcohol and drug services and vocational assistance for young people aged 12–25.[9] As *headspace* focuses both on youth mental health and early intervention, young people may present for care with varying illness severity (e.g. subthreshold through to severe symptoms and mild to severely impaired functioning) across a range of mental health problems.

A preliminary evaluation of *headspace* indicates that these clinical services (of which 40 currently operate throughout Australia) have been particularly effective in engaging males, who are generally more reluctant to seek help, but who constituted 43% of clients at the time of the evaluation.[15] The majority of young people either self-refer, or are referred by family, friends, health professionals or school counsellors. Mental health problems, predominantly anxiety and depressive symptoms, are the most common reasons for referral, often in the context of psychosocial issues such as family or relationship/peer conflict. The mean number of treatment sessions at *headspace* services is seven, and a range of interventions may be provided, including psychoeducation, supportive counselling,

cognitive behavioural therapy and medication where clinically indicated.[15]

Procedure

The study protocol was approved by the Human Research Ethics Committees at the University of Melbourne and the University of Sydney. Recruitment of the cohort commenced in January 2011 and ceased in August 2012. Annual follow-up assessments have commenced, and will continue until the study funding concludes in December 2013. All young people aged 12–15 who were receiving a clinical service at one of the *headspace* recruitment sites during the study period, were English-speaking and able to provide informed consent were approached for participation. There were no exclusion criteria other than significant intellectual disability (e.g. IQ < 65) that would preclude the ability to provide informed consent and complete the study assessment. However, young people who were acutely suicidal, as determined by their assessing or treating *headspace* clinician, were not approached for study inclusion until their suicidality had resolved to the point of their no longer being at high risk. Young people were contacted by a research assistant (RA) via telephone or in person to discuss the aims and nature of the study and their interest in participating. Contact was made either after the client's intake assessment (with a *headspace* Access Team clinician) or after their first treatment session with a *headspace* practitioner. Participants aged 15 years and over provided written informed consent, whereas those aged 12–14 years (inclusive) assented with written informed consent provided by a parent or guardian.

Research assistants with a minimum 4-year graduate psychology degree implemented the study protocol. The RAs were trained in the use of each study measure (see below) and achieved an inter-rater reliability score of at least 0.8 on each of the interviewer-rated clinical measures before recruitment commenced. The RAs conducted structured interviews with each participant using the clinical measures described below before then providing an iPad or laptop for the completion of a range of self-report measures (see risk factors and self-report clinical measures below). Finally, participants separately consented to provide a saliva sample and the RAs conducted height, weight and waist circumference measurements at the conclusion of the assessment. The combined interview, self-report, saliva and weight procedures took approximately 1.5–2 h to complete and participants were compensated with a $20 gift voucher for their time.

Measures

Clinical measures

Interviewer-rated measures. Health services use. A 15-item measure was adapted from the Australian National Mental Health and Wellbeing Survey[3] and asked participants about any health services they had used for mental health problems during both the past 12 months and lifetime. Items examined the types of health care professionals consulted, the nature of any treatments received (e.g. medications, psychological therapies, complementary and alternative medicines, and self-help), and the nature and frequency of hospitalizations.

Quick Inventory of Depressive Symptomatology (QIDS) 16-item adolescent version. The QIDS[16] assesses the presence, during the previous seven days, of the major diagnostic symptoms of depression according to the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (sleep disturbance, sad mood, appetite/weight disturbance, poor concentration, self-criticism, suicidal ideation, sleep disturbance, diminished interest, lowered energy/fatigue). Symptoms are rated on a 4-point Likert scale and combined to provide total scores ranging from 0 to 27. Scores above 16 are considered to indicate severe depression.

Self-harm. Two questions that have previously been employed to assess deliberate self-harming behaviours and suicide attempts among adolescents[17] were employed. Participants were asked (yes/no) whether they had deliberately hurt themselves, or done something to try and kill themselves in the past year. Affirmative responses to either question were further probed regarding the method and severity of the self-harming behaviours or suicide attempt.

Young Mania Rating Scale[18]. This 11-item measure indicates the nature and severity of manic symptoms within the past 48 h. Each item is graded across five explicitly defined anchor points (ranging from 0–4 for seven items to 0–8 for four items). The rating of items is based both on subjective report by the participant and the interviewer's behavioural observations. Total scores range from 0 to 60.

Comprehensive Assessment of the At-Risk Mental State (CAARMS[19]). The CAARMS is a semistructured interview that assesses the presence and severity of psychotic symptoms over the past 12 months. The

Positive Symptom Scale was used in this study and consists of four subscales: (i) unusual thought content; (ii) non-bizarre ideas; (iii) perceptual abnormalities; and (iv) disorganized speech. Scores for each of the subscales are rated according to their intensity, frequency and duration, pattern of symptoms and level of distress.

WHO-ASSIST. The Alcohol, Smoking and Substance Involvement Screening Test (ASSIST;[20]) assesses problematic or 'risky' use of tobacco, alcohol, cannabis and other illicit drugs (e.g. cocaine, amphetamines, sedatives, hallucinogens, inhalants, opioids). The ASSIST consists of seven questions for each drug category, and an eighth question on injecting drug use. It identifies the substances used and the substance-related harm over the participant's lifetime and the past 3 months.

Clinical Global Impressions Scale (CGI[21]). This single-item measure is completed by the interviewer based on their overall clinical impression of the participant, derived from all available information taken throughout the assessment and the interviewer's impression of the participant's functioning, symptoms and behaviour. The CGI indicates the severity of illness, ranked from 1 'normal, not ill at all' to 7 'among the most extremely ill patients'. An additional item is used at follow-up to indicate global improvement from 1 'very much improved' to 7 'very much worse' since the previous assessment.

Social and Occupational Functioning Scale (SOFAS[22]). The SOFAS is an observer-rated scale that provides a global assessment of the participant's social and occupational functioning. Scores range between 0 (e.g. unable to function) and 100 (superior functioning), with descriptive anchor points provided for each decile. SOFAS scores in this study were calculated based on the lowest level of functioning in the past year.

Self-report measures. Kessler 10 (K-10). The K-10[23] was used as a broad measure of psychological distress. Ten questions enquire about negative emotional states experienced during the past 4 weeks. Participants indicated the extent to which they experienced each item using a 5-point Likert scale (total scores range between 10 and 50). Scores between 25 and 29 indicate the likelihood of having a moderately severe mental disorder, with scores between 30 and 50 indicative of severe mental disorder.[23]

SPHERE-12. The SPHERE-12[24] was derived from the 34-item Somatic and Psychological Health Report (SPHERE) questionnaire. The 12-item measure assesses psychological and somatic distress, and comprises six somatic (fatigue, somatic complaints) and six psychological (depression, anxiety) items. Participants indicated the frequency with which they experience each item 'over the past few weeks' on a 3-point Likert scale.

GAD-7. The 7-item Generalized Anxiety Disorder scale (GAD-7;[25]) measures core symptoms of generalized anxiety disorder (e.g. feeling nervous, unable to relax, worrying about different things, afraid something awful might happen). Participants rated the frequency with which they have experienced these anxiety symptoms in the past 2 weeks on a 4-point Likert scale.

Overall Anxiety Severity and Impairment Scale (OASIS). The OASIS[26] consists of five items that measure the frequency and severity of anxiety, level of avoidance behaviours and the extent to which anxiety interferes with work/school/home and social functioning. Participants indicated the extent to which they experienced each item over the past week on a 5-point Likert scale.

SCOFF. The 5-item SCOFF[27] screens for symptoms of eating disorders by addressing core features of anorexia nervosa and bulimia nervosa. The acronym is derived from the five items, which enquire about (i) feeling **s**ick; (ii) losing **c**ontrol; (iii) losing more than **o**ne stone in 3 months, (iv) believing yourself to be **f**at and (v) **f**ood dominating your life. Each affirmative answer receives a score of 1, and a total score of 2 or more indicates significant anorexia nervosa or bulimia nervosa symptoms.

Disability Assessment Schedule (WHO-DAS-12). The 12-item WHO-DAS[28] examines difficulties in performing daily life activities. Participants were asked to rate their difficulty with performing a series of daily life activities during the past 30 days (e.g. maintaining a friendship, daily hygiene) on a 5-point Likert scale. Global scores range from 0 to 100 with higher scores indicating more severe disability.

Quality of Life (WHOQOL-1). One item from the WHOQOL-100 has previously been used[29] to assess perceptions of overall quality of life in the past 4 weeks. Participants were asked to rate their overall quality of life as one of the following: very poor, poor, neither poor nor good, good, very good.

Saliva. Participants were asked to provide separate consent for the collection of a saliva sample, for the purposes of genetic analysis (e.g. analysing genetic variation in relation to study outcomes, including transitions between clinical stages). Saliva was collected at the conclusion of the interview to ensure that participants has not eaten, drunk, smoked or chewed gum in the preceding 30 min. A standard protocol was used to collect and store the samples in individual saliva pots. Three barcodes were then used to label (i) the tube; (ii) the participant record form; and (iii) and the shipping paperwork. Samples were delivered in batches of 12 to the genetics repository service retained for the study, and were securely stored at room temperature in the interim.

Background and potential risk factors (self-report)

Demographics, education, work and household economics. Twenty-four questions examined the participant's age, gender, languages other than English, time lived in Australia, marital status, accommodation, living arrangements, education, employment, financial problems, income, government benefits and parents' country of birth. Items were adapted from the Australian Bureau of Statistics 2006 census questions[30] and other published sources.[31,32]

Exercise questionnaire. Six items from the Active Australia Survey[33] examined the frequency with which participants had engaged in three forms of physical activity in the past week, and the time spent (in minutes and/or hours) in each of these activities. Evidence from systematic reviews and meta-analyses indicates the relationship between exercise and decreased levels of both depression[34] and anxiety.[35]

Personality. The 24-item Behavioural Inhibition/Behavioural Activation System (BIS/BAS;[36]) was used as a broad measure of personality traits, including neuroticism. Respondents indicated the extent to which they agreed or disagreed with each item using a 4-point Likert scale. The questionnaire has scales for behavioural inhibition and behavioural activation, with subscales for reward responsiveness, drive and fun-seeking. The scale measures reactivity to punishment and reward and correlates highly with neuroticism and extraversion. However, unlike neuroticism scales, the BIS scale is free of obvious symptom content. There is evidence that the BIS/BAS predicts outcome of depression.[37]

Ruminative style. A brief 10-item questionnaire was used,[38] which was based on a longer, validated scale.[39] Respondents indicated the extent to which they experienced each item using a 4-point Likert scale. Numerous studies have shown that ruminative style predicts chronicity of depression and anxiety (e.g.[39]), including among adolescents.[40]

Life events. A brief list of threatening experiences developed by Brugha and colleagues[41] was adapted, in which two items from the original 12-item list were combined ('Separation due to marital difficulties' and 'Broke off a steady relationship') due to the low probability of adolescent participants endorsing 'marital difficulties'. Participants were asked to indicate (yes/no) whether they had experienced each life event in the past 12 months, and if yes, the number of months since the event occurred. There is a substantial literature regarding the relationship between exposure to adverse life events and psychiatric morbidity (see[42]).

Social support. A 20-item scale developed by Schuster *et al.*[43] was used to assess the presence of both negative and positive social interactions. Participants were asked to indicate the extent to which they experienced each of the items using a 4-point Likert scale. The measure provides scores in the domains of positive and negative social support from friends, family and (if applicable) partner. Negative interactions have been reported as being the more salient predictor of depression.[43]

Parental style. A short version of the Parental Bonding Instrument (PBI) developed by Heider *et al.*[44] was used. The questionnaire includes nine items for each parent (18 items total), with subscale scores for the domains of care, overprotection and authoritarianism. Participants were asked to remember each parent in the first 16 years of their life (or earlier for 12–15-year-olds) and then rate the frequency with which they experienced each item on a 4-point Likert scale. The PBI has been found to predict risk for anxiety and depression.[45]

Childhood Trauma Questionnaire (CTQ). The 28-item CTQ[46] inquires about the experience during childhood and adolescence of three types of abuse (emotional, physical and sexual) and two forms of neglect (emotional and physical). A 3-item scale is also used to detect false-negative trauma reports (e.g. 'I had the perfect childhood'). Participants indicated the extent to which they experienced each item while they were 'growing up' according to a 5-point Likert scale. There is substantial evidence

that child abuse, particularly sexual abuse, is a risk factor for a range of mental disorders, including mood and psychotic disorders (see[47]).

Sexual orientation. A single item previously used by Jorm *et al.*[48] was used, in which participants were asked: 'Would you currently consider yourself to be predominantly: heterosexual (straight), homosexual (gay), bisexual (bi), don't know, don't want to say'. Non-heterosexual orientation has been found to be associated with a range of mental health problems[48] as well as increased suicidality,[49] mediated by discrimination and bullying/harassment experiences.

Age of menarche. There is evidence that early menarche increases the risk of depression.[50] The following single-item question, previously used by Jorm *et al.*[51] asked (female) participants 'How old were you when your periods or menstrual cycle started?'.

Discrimination experiences. Three items were adapted from a discrimination scale in the Quality of Life in Newly Diagnosed Epilepsy Instrument (NEWQOL) battery.[52] Participants were asked whether or not, because of their mental health problems, 'other people: (i) are uncomfortable with me; (ii) treated me as inferior and (iii) preferred to avoid me'.

Sleep. Six items from the Pittsburgh Sleep Quality Index[53] assessed the following over the past month: usual time of going to bed, time to fall asleep (in minutes), usual time of waking, number of hours of sleep and perception of sleep quality. Considerable evidence links sleep disturbance and circadian rhythm abnormalities with mood disorders, particularly mania.[54]

Forensic history. Rates of criminal offending and crime victimization are significantly higher in individuals with mental disorder compared to the general population.[55] Three questions were used to assess whether participants had ever been charged with a criminal offence, convicted of an offence, or been a victim of crime. Affirmative responses were further probed with questions regarding the nature of the offence (e.g. physical assault, theft, drug possession, property damage) and the outcome of any charges or convictions.

Family history of mental disorder. Items regarding family history of emotional/psychological problems and suicide in parents and siblings adapted by King *et al.*[56] were used. Participants were asked (i) 'Have any of your family members had a serious psychological or emotional problem? (this refers to conditions such as depression, severe anxiety, nervous breakdown and schizophrenia)' and (ii) 'Has anyone in your family taken their own life (i.e. committed suicide)?' and asked to indicate whether or not (to their knowledge) these questions applied to each parent, and any siblings. Participants with no knowledge of their biological relatives were not required to complete this measure.

Annual follow-up procedure

Participants will be re-contacted 12 months after their baseline interview (i.e. between January 2012 and August 2013) and invited to complete a follow-up assessment. A subset of participants who completed their baseline assessment in 2011 will also be able to be contacted for 24-month follow-up (participants recruited in 2012 are unable to be assessed at the 2-year time point as the study funding concludes at the end of 2013). At the follow-up time points, each interviewer-rated measure is re-administered according to the protocol described above, with the exception of the Health Services Use items, which are amended to enquire only about the past 12 months (rather than lifetime). The K-10, SPHERE-12, GAD-7, OASIS, SCOFF, WHO-DAS and WHO-QOL are also re-administered, along with an abbreviated suite of self-report measures that focus on 'dynamic' risk domains that may have changed since baseline assessment, namely, demographics, exercise, social support, life events, sexual orientation, age of menarche, discrimination, sleep and forensic history.

Between baseline and follow-up assessment, participants are contacted via a postcard (mailed or emailed) to provide (i) an update on the project; (ii) a reminder of the upcoming annual assessment; and (iii) inform participants how to notify research staff of any change in their contact details. To maximize the ability to re-contact participants (and retain the cohort), a variety of contact information is collected, including the participant's full name, home address, phone number(s) and email address, as well as the name and contact details of their general practitioner or other health professional, their mother's and father's full names and contact details (where appropriate given family circumstances) and the contact details of at least one friend.

Clinical staging of participants

Each participant is assigned a preliminary clinical stage following their baseline and follow-up

assessments. Staging decisions are based on the detailed descriptive criteria provided by Hickie *et al.* (see Appendix I[12]), which elaborates on McGorry *et al.*'s[10] original staging model. In essence, this clinical stage is based on the 'gestalt' of the participant's presentation, including current major symptoms (severity, frequency, type), previous 'worst ever' symptoms and treatments (including hospital admissions), current and past level of risks due to self harm, suicide attempts or other at-risk behaviours and current (as compared with premorbid) levels of functioning. The stage for each participant was formulated following discussion between the RA and their clinical supervisors.

At the end of baseline recruitment, 802 eligible participants were recruited (e.g. consented to participate and meet the inclusion criteria), of whom 66% (n = 529) were female.

Statistical analyses. The fundamental premise of the study (Hypothesis 1) will be evaluated using a range of latent variable methods including confirmatory factor analysis and exploratory structural equation modelling.[57] Algorithms representing staging models defined by expert consensus will also be applied to the data.

Having established the measurement structure of pluripotential status, conventional epidemiological approaches to assessing risk factors for elevation of this dimension (or dimensions) will be used. This will yield estimates of relative risk of having pluripotential status. These methods are equally adaptable to categorical structures, such as the proposed staging models and clinical syndromes. Conventional risk factor analysis will explore predictors of change. Contingent on observation of adequate numbers of particular types of transitions and remissions, we hope to develop a structural model incorporating multiple outcomes. This would enable simultaneous evaluation of the impact of general and specific factors in predicting disorder progression and remission.

DISCUSSION

This paper describes the Transitions Study, which seeks to empirically test and validate a clinical staging model for the spectrum of psychotic, mood/anxiety, eating and substance use disorders in young people. A range of psychological, social and genetic markers have been tested, in terms of their capacity to define current clinical stage and to predict transition from less disabling to more disabling stages of mental and substance use disorder. The study is innovative in its aims to define phases of vulnerability, earliest clinical manifestations, clinical phenotype at first presentation and later stages of recovery and illness progression in a large cohort of young people who are seeking help for mental health problems.

The implications and clinical significance of this research is the opportunity to develop a simplified and practical approach to diagnosis and treatment selection in the poorly differentiated early stages of mental disorder, which is likely to be much needed given the far greater prevalence of such subthreshold states in the community, for example, depressive disorders (see[58]). In addition, the ability to determine genetic or psychosocial markers of illness stage (including predictors of transition from less severe to more severe illness forms) would represent a major breakthrough in our understanding of the pathophysiologies of complex mental disorders, including psychosis, severe depression, mania, anxiety with marked avoidance, eating disorders and substance use disorder.

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STROBE 2007 (v4) Statement—Checklist of items that should be included in reports of *cross-sectional studies*

Section/Topic	Item #	Recommendation	Reported on page #
Title and abstract	1	(*a*) Indicate the study's design with a commonly used term in the title or the abstract	2
		(*b*) Provide in the abstract an informative and balanced summary of what was done and what was found	2
Introduction			
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	4-5
Objectives	3	State specific objectives, including any prespecified hypotheses	6
Methods			
Study design	4	Present key elements of study design early in the paper	6
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	6
Participants	6	(*a*) Give the eligibility criteria, and the sources and methods of selection of participants	6
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	7-9
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	7-9
Bias	9	Describe any efforts to address potential sources of bias	*6*
Study size	10	Explain how the study size was arrived at	6
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	9
Statistical methods	12	(*a*) Describe all statistical methods, including those used to control for confounding	9
		(*b*) Describe any methods used to examine subgroups and interactions	9
		(*c*) Explain how missing data were addressed	9
		(*d*) If applicable, describe analytical methods taking account of sampling strategy	9
		(*e*) Describe any sensitivity analyses	9
Results			

Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	10
		(b) Give reasons for non-participation at each stage	na
		(c) Consider use of a flow diagram	na
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	10
		(b) Indicate number of participants with missing data for each variable of interest	10
Outcome data	15*	Report numbers of outcome events or summary measures	10
Main results	16	(*a*) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included	10-11
		(*b*) Report category boundaries when continuous variables were categorized	10-11
		(*c*) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	na
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	na
Discussion			
Key results	18	Summarise key results with reference to study objectives	11
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	13
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	11-13
Generalisability	21	Discuss the generalisability (external validity) of the study results	13
Other information			
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	18

*Give information separately for cases and controls in case-control studies and, if applicable, for exposed and unexposed groups in cohort and cross-sectional studies.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at http://www.plosmedicine.org/, Annals of Internal Medicine at http://www.annals.org/, and Epidemiology at http://www.epidem.com/). Information on the STROBE Initiative is available at www.strobe-statement.org.

BMJ Open

A cross-sectional exploration of the clinical characteristics of disengaged (NEET) young people in primary mental health care

Journal:	*BMJ Open*
Manuscript ID:	bmjopen-2014-006378.R1
Article Type:	Research
Date Submitted by the Author:	25-Nov-2014
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Primary Subject Heading:	Mental health
Secondary Subject Heading:	Health services research
Keywords:	NEET, youth, unemployment, role functioning, clinical stage

Title: A cross-sectional exploration of the clinical characteristics of disengaged (NEET) young people in primary mental health care.

Running title: NEET status among help-seeking young adults

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ABSTRACT

Objective: Youth with mental health problems often have difficulties engaging in education and employment. In Australia, youth mental health services have been widely established with a key aim of improving role functioning; however, there is little knowledge of those who are not engaged in employment, education or training (NEET) and the factors which may influence this. This study aimed to examine NEET status and its correlates in a sample of such youth.

Design: Cross-sectional data from a longitudinal cohort study.

Setting: Between January 2011 and August 2012, young people presenting to one of four primary mental health centres in Sydney or Melbourne were invited to participate.

Participants: Young adults (N = 696) aged between 15 – 25 years (M: 19.0, SD: 2.8), 68% female, 58% (n = 404) attended *headspace* Sydney.

Measures: Individuals 'Not in any type of Education, Employment or Training' in the past month were categorised as NEET. Demographic, psychological and clinical factors alongside disability and functioning were assessed using clinical interview and self-report.

Results: A total of 19% (130/696) were NEET. NEETs were more likely to be male, older, have a history of criminal charges, risky cannabis use, higher level of depression, poorer social functioning, greater disability and economic hardship, and a more advanced stage of mental illness than those engaged in education, training or work. Demographics such as post-secondary education, immigrant background and indigenous background, were not significantly associated with NEET status in this sample.

Conclusions: One in five young people seeking help for mental health problems were not in any form of education, employment and training. The commonly observed risk factors did not appear to influence this association, instead, behavioural factors such as criminal offending and cannabis use appeared to require targeted intervention.

KEYWORDS

NEET, youth, unemployment, role functioning, clinical stage

ARTICLE SUMMARY

Strengths and limitations of this study

- This study is one of the first to examine the prevalence of NEET status in young Australians seeking help for mental health problems. It highlights that NEET rates in such youth (19%) are higher than that found in general population studies of Australian youth (11%).
- This study identified that NEET youth are more likely to be older males with a history of criminal offending as well as risky cannabis use. Not surprisingly, NEET youth reported greater levels of economic disadvantage and poorer social and occupational functioning. NEET youth were also more likely to have higher levels of depression and be in a more advanced stage of mental illness.
- Although this study is a cross-sectional cohort analysis, it exemplifies that 1 in 5 young people presenting to mental health services are likely to be NEET. Furthermore, previously identified demographic associations were not significantly associated with NEET status in this sample. Instead, behavioural factors such as criminal offending and cannabis use appear to require targeted interventions if the aim is to restore role functioning.
- This study was only able to identify 11% of the variance in NEET status. This strongly suggests that there are a range of other important factors that need to be investigated before NEET status is fully understood in this vulnerable group.

BACKGROUND

Participating in education and employment is considered key to the transition to successful adult wellbeing. Employment and education provides both manifest (e.g. income) and latent (e.g. time structure, social contact, sharing of common goals, status and activity, social and occupational support) benefits to an individual [1]. Individuals with low educational attainment and/or limited employment experience a greater likelihood of social exclusion [2], disability and isolation, in addition to the impacts of low income: poorer quality of life, more illness and disease [3], decreased access to healthcare, increased levels of psychological distress, and maladaptive lifestyle behaviors such as substance misuse [4-6] and criminal activity [7]. Chronic unemployment is associated with severe levels of disadvantage and carries a significant economic cost to both the individual and society including lost earnings and taxes, as well as the increased burden on welfare and healthcare systems [8].

Adolescence and early adulthood is a crucial period in which skill development and social roles are initiated. Young people who are 'Not in Education, Employment or Training' (NEET) [5] are important to clinicians, policy makers and researchers as this signifies an absolute disengagement from both the labour market and a major avenue of human development. Currently, the large majority of NEET statistics are compiled by the Organisation for Economic Co-operation and Development (OECD) who provide annual comparisons of NEET rates among general youth populations in different countries. Since the onset of the global financial crisis (mid 2007), NEET rates among young people have increased considerably [9]. In 2011, the NEET rate among Australian youth was 11% [10]: higher than the rate for the Netherlands and Denmark (approx. 5%) but lower than those countries heavily affected by the financial crisis, such as Greece and Spain (approx. 18%) and those outside the European Union e.g. Israel and Turkey (approx. 30%). While the direct causal path for NEET status has not yet been determined, longitudinal studies conducted in the United Kingdom have demonstrated that NEET status at the age of 16 years predicts NEET status at the age of 18 years [11] and is a strong predictor of chronic unemployment in adulthood [12 13]. However, the precise risk factors and trajectories of NEET status in young people remain unclear.

In population studies, certain traits are overrepresented among NEET youth. The key correlates identified to date tend to be demographic and social factors; specifically, socio-economic status, ethnic and immigration background,

parental factors (e.g., occupation, educational attainment, divorce, parental unemployment), living arrangements (e.g. not living with either parent, homelessness), negative school experiences (e.g., low educational attainment, bullying, persistent truancy, expulsion and suspension, conduct and behavioral problems, learning difficulties) and crime [14-16]. Additionally, the likelihood of being NEET increases with age and is reported as being more common among females [10 17], although some samples report higher rates among males [16]. These risk factors are derived from routinely collected information in social insurance and census databases to determine NEET status. In most cases, very little attention is paid to health or disability factors. Given that mental ill health is the primary cause of disability amongst people in OECD countries [18 19] addressing NEET status among young people with mental illness is a key concern [20].

Importantly, young people often exhibit substantial levels of disability prior to the complete manifestation of a mental disorder, reflecting either the putative prodrome of an illness [21 22] or the consequence of disengagement from employment and education [23]. A range of youth focused services, such as *headspace* in Australia, have been established to improve clinical outcomes; however, these services were also predicated upon the notion that investment in early treatment and selective prevention would produce long term socioeconomic savings [24]. The National Mental Health Commission (2013) recommended that improving social participation should also be a key outcome of such services, suggesting that clinical care must now focus on improvements beyond symptomatology. Currently, most knowledge about improving social functioning in this area is derived from studies of those with early psychosis and severe mental illness (e.g. IPS: Individual Placement and Support for early psychosis) [25]; however, the large majority of youth presenting to *headspace* experience chronic or recurrent mood, anxiety and substance abuse disorders [20]. In order to best target current and future primary health services, it is important to understand the risk profile of NEET among young people who are seeking help from these services. Such knowledge might help improve service delivery, providing opportunities for the services to intervene in the other life domains, such as employment and training, which are negatively affected by mental illness.

This study aimed to explore the prevalence of NEET status in a cross-section of young adults seeking help at a primary mental healthcare service. We wished to determine which non-clinical and clinical factors were associated with being NEET. Given that male and female youth often present with different symptom and behavioural profiles

[22], this study also aimed to determine whether the associations with NEET status were moderated by gender. By attempting to profile those who are NEET, treatment and prevention strategies can be modified accordingly.

METHOD

Sample

Between January 2011 and August 2012, all young people aged between 12 – 25 years who presented to one of four *headspace* clinics in Sydney and Melbourne (with varied demographic catchment areas) were approached for participation in a longitudinal cohort study evaluating the course of psychiatric disorders among young people, described in full elsewhere [26]. Established by the Australian Government in 2006, *headspace* centres provide youth-focused mental health and general health services, drug and alcohol services, and vocational assistance to young people aged 12–25 years. There is direct access with no need for a clinician referral and no specific catchment area. There are currently 55 centres located nationally, the four in this study being amongst the first established. The most common reasons for attendance at *headspace* are mental health problems, primarily anxiety and depressive symptoms, often in the context of psychosocial issues such as relationship conflict with family and peers [27]. As *headspace* focuses on both youth mental health and early intervention, young people may present for care with varying illness severity (e.g. from sub threshold symptoms to chronic disorders, mild to severely impaired social functioning) across a range of mental health problems [22]. Individuals with a clinician-determined intellectual disability, acute suicidality or those without fluent English were not invited to participate. A total of eight hundred and two participants were recruited. To ensure consistency with OECD descriptions of NEET status [28] and compulsory education age in Australia, participants aged below 15 years (n =106) were excluded from this study (Final N = 696).

Procedure

After the individual's initial clinical assessment, consenting participants were contacted by a research assistant (RA) via telephone or in person to discuss the nature and aims of the research. Participants provided written informed consent. Participants were assessed by RAs who held graduate degrees in psychology using a structured interview consisting of the clinical measures outlined below. RAs were trained in the use of the structured interview and achieved an inter-rater reliability score of at least 0.8 on each of the interviewer-rated clinical measures before

recruitment commenced. After the interview each participant was provided an iPad or laptop for the completion of the self-report measures. This process took approximately 1 – 2 hours to complete. Participants received a $20 gift voucher for reimbursement.

Measures

Not in Education, Employment or Training (NEET) status

Using questions from the Australian Bureau of Statistics (ABS) 2006 Census [29] participants reported if they were currently in any education, training or employment (yes/no) and how many hours per week they participated. Participants were also asked whether they had worked for payment or profit in the past month to which answers were given as: a) worked full time b) worked part-time c) did not have a job for which I received payment. To capture those who had completely disengaged from education and employment, individuals reporting that they were 'Not in any type of Education, Employment or Training in the past month' were categorised as NEET, regardless of their volunteering roles, caring roles or parenting roles.

Demographics

Participants' age, gender, immigration background, post-secondary education, indigenous background, economic hardship, criminal charges, and government assistance were assessed using self-report. To allow for comparison with other national and international NEET data, age was dichotomised: 15 – 19 years *vs*. 20 – 25 years. *Immigration background:* participants not born in Australia or those with one or both parents born overseas were classified as being of an 'immigrant background'. *Post-secondary education:* achieved by participants (none *vs*. trade, apprenticeship, certificate, diploma, university degree). *Indigenous background:* those who identified as being Aboriginal, Torres Strait Islander, or Maori. *Economic hardship:* ABS questions assessing a reported inability of an individual or their family to pay a household expense, or the deployment of dissaving behaviour such as borrowing money to do so in the previous three months. *Criminal charges:* participants reported the number and nature (e.g. assault, property damage, theft/burglary, drug use/manufacture/possession, other) of criminal charges they had ever faced by the police. *Government benefits:* participants were asked to report whether they had received any government benefits in the past three months (e.g. Youth Allowance, Disability Support Pension, Newstart,

Other). *Location of service:* The location of the *headspace* service attended by participants was recorded by administration and categorised as either 'Sydney, NSW' or 'Melbourne, Victoria.

Psychological and clinical risk factors

Substance misuse: participants' alcohol, cannabis and tobacco misuse were assessed in the clinician interview using the WHO Alcohol, Smoking and Substance Involvement Screening Test (WHO-ASSIST) [30] which provides a category of risk for a range of drugs including tobacco, alcohol and cannabis based on items 2,- 7. For cannabis and tobacco, substance involvement scores greater than 3 indicated 'at risk' participants and for alcohol, scores greater than 10. 'At risk' of misuse individuals are at risk of, or already are, experiencing health, social, financial, legal and relationship problems resulting from their substance use, and the possibility of dependence. *Childhood Onset Disorder:* participants' recall of a prior diagnosis of a disorder in childhood such as hyperactivity, autism, attention deficit disorder or conduct disorder. *Depressive symptoms:* assessed using the clinician rated Quick Inventory of Depressive Symptomatology (QIDS-C_{16}) [31] which examined the presence, during the previous seven days, of the major DSM-IV diagnostic symptoms of depression rated on a 4-point Likert scale, combined to provide total scores ranging 0 – 27. *Anxiety* was assessed by self-report using the Generalised Anxiety Disorder (GAD-7) questionnaire [32]. *Clinical Stage:* was operationalised as a clinician-rated indicator of the severity and chronicity of mental illness experienced by participants. In accordance with the criteria established by the clinical staging model [33], participants were classified as either 'Stage 1' (non-specific symptoms or attenuated syndrome) or 'Stage 2+' (first episode of discrete disorder or persistent, recurrent mental illness). Participants' level of social and neurocognitive functioning are also considered when determining clinical stage. Staging decisions were based upon the results of the clinical interview with any discrepancies resolved in consensus meetings with research assistants and clinical supervisors.

Functioning measures

Disability: using the 12 item self-report WHODAS12 questionnaire [34], participants self-rated their difficulty performing daily life activities during the past 30 days. Global scaled scores range from 0–48 with higher scores indicating a moderate to severe level of disability. *Social and Occupational Functioning:* assessed by the interviewer using the clinician-rated Social and Occupational Functioning Assessment Scale (SOFAS) which

allocated an overall functioning score ranging between 0–100, with higher score suggesting a superior level of functioning.

Analysis

This investigation used cross-sectional baseline data from a longitudinal cohort study. All statistical analyses were conducted in SPSS Version 22. Group differences between NEET and non-NEET participants were assessed using *t*-tests and simple logistic regressions for categorical variables. Levene's tests for equal variances were conducted for the continuous variables, for which none violated any assumptions. Due to the number of univariate analyses conducted, an alpha correction using the Bonferroni method was made: the adjusted alpha level for statistical significance was determined to be $p < .003$. To examine the independent associations of NEET status, a hierarchical logistic regression was conducted: NEET status was entered as the dichotomous dependent variable. All variables achieving significance at $p < .003$ in the univariate analysis were included in the first step of multivariate analysis except for self-reported disability and social and occupational functioning due to the circularity with NEET status. To control for the relationship between criminal charges and income, economic hardship was entered as a confounder. The interaction terms for gender were subsequently added in the second model. Continuous variables were centered before interaction terms were created and only centered variables are included in the multivariate analyses. Only models with non-significant Hosmer-Lemeshow goodness-of-fit tests were included.

Ethics

Ethics was granted by the Human Research Ethics Committees at the University of Melbourne and the University of Sydney.

RESULTS

Participants

In this sample of help-seeking young adults ($N = 696$, M_{age}19 years, SD: 2.8, age range: 15 – 25 years, 68% female), 58% ($n = 404$) attended *headspace* Sydney, 42% ($n = 291$) had one or both parents born overseas; 19% ($n = 129$) had a post-secondary education; 4% ($n = 28$) were Indigenous; 32% ($n = 226$) experienced economic hardship, and

17% (*n* = 117) reported one or more instances of perceived discrimination. A total of 70 participants (10%) had a history of criminal offending with 132 counts of crime reported: 36% (47) theft/burglary, 19% (25) were physical assault, 16% (21) property damage, 14% (19) were drug related, 15% (20) were 'other'. In the current sample, 19% (*n* = 133*)* were classified as at risk for alcohol, 50% (*n* = 346) for tobacco and 29% (*n* = 199) for cannabis. The mean symptom and functioning scores were: depression (QUIDS) 10.44 (SD: 5.34, range 0 – 26), anxiety (GAD) 10.10 (SD: 5.95, range 0 – 21), self-rated disability (WHODAS) 13.25 (SD: 9.39, range 0 – 47) and SOFAS 65.33 (SD: 11.61, range 30 – 95) with 13% (*n* = 91) reporting a child onset disorder and 13% (*n* = 93) classified as Clinical Stage 2+.

NEET status

A total of 19% (*n* = 130/679) of participants were classified as 'Not engaged in any Employment, Education or Training' (NEET). Among these, 68% (*n* = 88/130) had received some form of government assistance in the past three months: 26% (*n* = 34) received youth allowance, 25% (*n* = 32) received unemployed/job seekers allowance, 11% (*n* = 14) received the disability support pension, 8% (*n* = 7) received a parenting payment and one participant reported receiving 'other'. NEETs were more likely to be male and aged between 20 – 25 years (see Table 1). NEETs had higher symptom levels of depression, but not anxiety, and were more likely to be in a progressed stage of mental illness (Clinical Stage 2). NEETs reported higher levels of disability, lower levels of social and occupational functioning and higher rates of economic hardship (Table 1). NEETs were also more likely to have a history of criminal charges and risky cannabis use (but not alcohol or tobacco) than non-NEETs. Notably, NEET status was not associated with state location of centre, immigrant background, post-secondary education or indigenous background. In Model 1 of the multivariate analysis (Table 2), older age (20 – 25 years), gender (male), a history of criminal charges, cannabis risk and depressive symptoms were independently associated with NEET status. This model accounted for 10% of the variance in NEET status. Whilst Model 2 was significant overall, the addition of the gender interaction terms did not significantly improve the model fit. In particular, the association between depressive symptoms and NEET status was not moderated by gender. All of the associations found in Model 1 remained significant, confirming that NEET status was most strongly associated with older age, being male, criminal charges and depression.

DISCUSSION

In this sample of young adults with mental health problems, nearly one in five (19%) were not engaged in any education, employment or training. This rate is nearly twice that found among the general population of youth aged 15 – 24 years living in Australia (11%, OECD 2011). In the current study, those categorised as NEET had higher symptom levels of depression and a more advanced stage of mental illness: NEETs were more likely to be male, older, have a history of criminal charges and risky cannabis use. Not surprisingly, NEET participants had lower levels of social and occupational functioning, higher levels of disability and experienced greater economic hardship compared to non-NEETs. Interestingly, demographic factors commonly found to be associated with NEET status in routine population statistics [6] such as post-secondary education, immigration background, indigenous background were not significantly associated with NEET status in this sample. This suggests that although such factors may be important for young adults with reasonable mental health, these factors are less important in this restricted sample. Alternatively, mental ill-health and substance abuse may mediate or confound the impact of these demographic risks. Overall, the results find that young adults with mental health problems, particularly older males, are at high risk of being NEET and may experience a level of vocational and educational disability that is on par with some of the most disadvantaged OECD nations in the world [5].

In the current study, males were more likely to be NEET than females. This is somewhat inconsistent with OECD data which generally reports a higher prevalence of NEET status among women [10 17 28]. We suspect that this is related to the nature of the data used to ascertain NEET status on a population level by OECD countries. More often than not, NEET status includes those who partake in care giving roles such as full-time parenting. As females tend to adopt such roles in most countries, it is difficult to determine which gender is truly disengaged from a meaningful role. In countries which do account for this (e.g. Scandinavia), sex differences in NEET status are either not as profound, or are more common in men [17]. Furthermore, longitudinal cohorts from the United Kingdom [11] consistently report a higher likelihood of males being NEET. This highlights the current difficulties in comparing NEET rates and supports the need for a more cohesive approach to examining NEET status.

Of the symptom factors, depression was significantly associated with NEET status. The main association is not surprising as depressed individuals report greater restlessness, trouble concentrating and a failure to consider or plan for the future [35]. Those with depression often withdraw from social activities and relationships, decreasing the size of their social networks and severing relationships which may offer support and enhance occupational functioning. Conversely, disengagement is also likely to lead to worse mood: being NEET may exacerbate depressive symptoms, leading to greater social isolation and diminished role functioning. Although not significant, a greater proportion of those who were NEET also reported higher rates of perceived discrimination. Understanding the links between mental illness, in particular depression, stigma and role functioning is important for the development of both clinical treatments and social programs attempting to improve role functioning. However, the current findings may reflect a sample bias: mental health services such as *headspace* may be capturing those NEETs who are experiencing depressive symptoms rather than those NEET who are not.

Criminal offending and cannabis use were significantly associated with NEET status. The latter is not surprising as substance use often emerges as a risk factor for both poorer functioning and clinical symptoms in studies of youth [36-38]. As demonstrated by the current study, cannabis use may place young adults at greater risk of becoming NEET, although a trend also appears for tobacco use. As poor physical health is associated with these substances, youth focused health services must seriously account for the impact of substance use on treatment outcomes and role functioning. Innovative treatment approaches are needed as many young adults are reluctant to engage in interventions for substance use. Given the widely published link between youth unemployment and crime [39], the association between criminal offending and NEET status were also not unexpected. The precise direction of causality between these variables cannot be determined by the current study: whether criminal offending is a consequence of economic hardship (as a number of criminal offenses were for theft) [40], or representative of greater social adversity or other underlying personality traits, is unknown. Regardless, these results signify that such behavior limits the capacity for role functioning in young adults. These findings suggest that if the aim of services like *headspace* is to increase role functioning in young adults with mental health problems, simply focusing on ameliorating symptoms, predominantly anxiety and depression, may not be the best approach [24].

Limitations

This study is based on a cross-sectional sample of self-selected, help-seeking young adults with mental health problems. The findings may be limited by such selection bias although the overall level of NEET status and the gender differences in the sample are similar to those reported in the national *headspace* dataset [27]. The current study did not include a control group and as such, no comparisons can be made to youth without mental health concerns or those not seeking help. Whilst parenting or caring roles were not separated from NEET status in the current study, 14 participants (7 of which were NEET) received a parental payment from the government, suggesting that 2% of the total sample were parents. As females are more likely than males to adopt caring roles in the absence of education, employment or training, [11] future investigation may benefit from focusing on the nature of such responsibilities within similar samples of NEETs. Importantly, different associations for NEET status may be found among young adults who present to other services (e.g. justice and criminal systems) and among samples that are more culturally and ethnically diverse. As the final regression model only accounted for 11% of the variance in NEET status, a range of other factors need to be considered including the family unit, cognitive impairment [41] and occupational aspirations [42]. Future research would benefit from determining the range of other factors, both clinical and non-clinical, including the economic environment that may be related to NEET status in young adults with mental health concerns. Research with a longitudinal focus would help untangle the direction of causality and outline the trajectories of NEET status in youth.

Conclusions

This study confirms that among young adults with mental health problems, NEET status is highly prevalent [20]. The factors identified in this study suggest that when designing clinical or policy initiatives to improve role functioning among youth with mental health problems it is necessary to consider a range of clinical and non-clinical factors. Traditional clinical approaches which focus on symptoms may need to be augmented and tailored in help-seeking young adults. Multidisciplinary approaches to offending behavior and substance use are also required. Furthermore, it appears that males with mental health concerns are at considerable risk of being NEET and that *headspace* appears to be capturing these men at a later age, in a more progressed stage of mental illness and experiencing greater social dysfunction when compared to females [27]. Collaborative and integrated service centers such as *headspace* are more likely to be effective in achieving their policy objectives in the functional and economic

domains by further understanding the groups most at risk and allocating resources appropriately. However, the high proportion of youth presenting as NEET suggests that these "early intervention services" are, in many cases, not "early" enough.

Table 1. Univariate associations with NEET status among young adults seeking help for mental health problems (*n* = 679)

	NEET *n* = 130 (19%)	Non-NEET *n* = 549 (81%)		
	n (%)	*n* (%)	OR (95% CI)	*p*
Sydney	75 (58%)	314 (57%)	1.02 (0.69 – 1.50)	.92
20 – 25 years	77 (59%)	206 (30%)	2.42 (1.64 – 3.57)	**.000**
Male	62 (48%)	159 (29%)	2.24 (1.51 – 3.31)	**.000**
Immigrant background	58 (45%)	233 (42%)	1.09 (0.74 – 1.61)	.65
Indigenous background	6 (5%)	22 (4%)	1.16 (0.46 – 2.92)	.75
Criminal charges	26 (20%)	44 (8%)	2.85 (1.68 – 4.83)	**.000**
Post-secondary education	22 (17%)	107 (19%)	0.84 (0.51 – 1.39)	.50
Economic hardship	54 (42%)	172 (31%)	2.15 (1.37 – 3.39)	**.001**
Perceived discrimination	29 (22%)	88 (16%)	1.94 (1.11 – 3.38)	.02
Alcohol risk	30 (23%)	100 (18%)	1.37 (0.86 – 2.17)	.19
Tobacco risk	74 (57%)	262 (48%)	1.46 (0.99 – 2.16)	.05
Cannabis risk	50 (38%)	139 (25%)	1.94 (1.29 – 2.90)	**.001**
Child onset disorder	27 (21%)	62 (11%)	2.06 (1.24 – 3.40)	.01
Clinical stage 2+	35 (27%)	56 (10%)	3.20 (1.99 – 5.16)	**.000**
	M (SD)	M (SD)	MD (95% CI)	*p*
Anxiety score	11.35 (6.16)	9.81 (5.87)	1.54 (0.41 – 2.68)	.01
Depression score	12.62 (5.56)	9.89 (5.10)	2.72 (1.73 – 3.72)	**.000**
Self-rated disability	16.19 (9.94)	12.55 (9.12)	3.65 (1.86 – 5.43)	**.000**
SOFAS	56.14 (10.40)	67.67 (10.80)	-11.53 (-13.59 – -9.48)	**.000**

Note. **Bold =** $p < .003$. OR = Odds Ratio, CI = Confidence Interval, SOFAS: Social and Occupational Functioning Assessment Scale (range 0 - 100).

Table 2: Multivariate associations with NEET status among young adults seeking help for mental health problems (*n* = 526)

	Base model C-S $R^2 = 0.10^*$				+ Gender interaction terms C-S $R^2 = 0.11^*$			
	B (SE)	OR	95% CI	*p*	*B(SE)*	OR	95% CI	*p*
Male	0.76 (0.27)	2.13	1.26 – 3.60	**.005**	1.50 (0.46)	4.50	1.81 – 11.16	**.001**
Age 20 – 25 years	0.77 (0.26)	2.16	1.30 – 3.60	**.003**	1.04 (0.34)	2.82	1.44 – 5.51	**.002**
Economic hardship	0.47 (0.27)	1.60	0.95 – 2.69	.080	0.45 (0.27)	1.57	0.93 – 2.68	.095
Criminal charges	0.81 (0.35)	2.24	1.13 – 4.42	**.020**	1.36 (0.51)	3.84	1.43 – 10.34	**.008**
Cannabis risk	0.20 (0.27)	1.22	0.72 – 2.05	.082	0.57 (0.35)	1.78	0.90 – 3.49	.100
Depression score	0.10(0.02)	1.10	1.05 – 1.15	**.000**	0.07 (0.03)	1.07	1.01 – 1.14	**.025**
Age group*gender					-0.52 (0.52)	0.60	0.22 – 1.65	.318
Criminal charges*gender					-0.97 (0.70)	0.38	0.10 – 1.47	.161
Cannabis risk*gender					-0.92 (0.55)	0.39	0.13 – 1.17	.094
Depression*gender					0.07 (0.05)	1.07	0.97 – 1.18	.191

Note: * $p < .001$ **bold** = $p < .05$. Base Model: Nag $R^2 = 0.16$, -2LL: 428.76, Model χ^2 (6) = 52.67, $p < .001$, Step 2 (+ Gender Interaction Terms): Nag $R^2 = 0.18$, -2LL: 419.89, Model χ^2 (10) = 61.54, $p < .001$, $\Delta\chi^2$ (4) = 8.87, $p = .064$.

Contributorship Statement: The study was designed and conducted by PM, IH, NG, DH, RP, EK, AY, AG, ES. The analysis of data and interpretation was conducted by BOD, KLF, NG. The paper was prepared by BOD, NG, and KLF and critically revised by PM, IH, JS, DH, RP, EK, AY, ES, AG, JB. The other investigators on the Transitions Study were A. Jorm, E. Killackey, L. Phillips, S.W. Wood, A. Mackinnon, E. Scott, A. Yung, A. Kenyon, L. Mundy, A. Nichles, A, Scaffidi, D. Spiliotacopoulos, L. Taylor, J.P.Y Tong, S. Wiltink, N. Zmicerevska, and A. Guastella. This study was conducted at Brain and Mind Research Institute, University of Sydney and Orygen Youth Health Research Centre, Melbourne.

Competing Interests: Professor Hickie is a Board Member of Psychosis Australia Trust. From 2012, he has been a Commissioner in Australia's new National Mental Health Commission. He was until January 2012 a director of headspace: the national youth mental health foundation. Prof Hickie was previously chief executive officer (till 2003) and clinical adviser (till 2006) of beyondblue, an Australian National Depression Initiative. He is supported principally for clinical research in depression and health services and population health initiatives related to anxiety and depression by an NHMRC Australian Medical Research Fellowship (2007–12) and now by an NHMRC Senior Principal Research Fellowship (2013-17). He has led projects for health professionals and the community supported by governmental, community agency and pharmaceutical industry partners (Wyeth, Eli Lily, Servier, Pfizer, AstraZeneca) for the identification and management of depression and anxiety. He has received honoraria for presentations of his own work at educational seminars supported by a number of nongovernment organisations and the pharmaceutical industry (including Pfizer, Servier and Astra Zeneca). He has served on advisory boards convened by the pharmaceutical industry in relation to specific antidepressants, including nefazodone, duloxetine, and desvenlafaxine. He leads an investigator-initiated study of the effects of agomelatine on circadian parameters (supported in part by Servier but also by other NHMRC funding) and has participated in a multicentre clinical trial of agomelatine effects on sleep architecture in depression and a Servier-supported study of major depression and sleep disturbance in primary care settings. In addition to national and international Government-based grant bodies, investigator-initiated mental health research at the BMRI he has been supported by various pharmaceutical manufacturers (including Servier and Pfizer) and not-for-profit entities (including the Heart Foundation, beyondblue and the BUPA Foundation). All other authors declare no conflicting interests.

Funding: The study was supported by an NHMRC Program Grant (ID: 566529).

Data sharing: The dataset for this study is not currently publically available; however, all statistical code can be reviewed by contacting the corresponding author bridianne.odea@sydney.edu.au

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Title: A cross-sectional exploration of the clinical characteristics of disengaged (NEET) young people in primary mental health care.

Running title: NEET status among help-seeking young adults

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ABSTRACT

Objective: Youth with mental health problems often have difficulties engaging in education and employment. In Australia, youth mental health services have been widely established with a key aim of improving role functioning; however, there is little knowledge of those who are not engaged in employment, education or training (NEET) and the factors which may influence this. This study aimed to examine NEET status and its correlates in a sample of such youth.

Design: Cross-sectional data from a longitudinal cohort study.

Setting: Between January 2011 and August 2012, young people presenting to one of four primary mental health centres in Sydney or Melbourne were invited to participate.

Participants: Young adults (N = 696) aged between 15 – 25 years (M: 19.0, SD: 2.8), 68% female, 58% (n = 404) attended *headspace* Sydney.

Measures: Individuals 'Not in any type of Education, Employment or Training' in the past month were categorised as NEET. Demographic, psychological and clinical factors alongside disability and functioning were assessed using clinical interview and self-report.

Results: A total of 19% (130/696) were NEET. NEETs were more likely to be male, older, have a history of criminal charges, risky cannabis use, higher level of depression, poorer social functioning, greater disability and economic hardship, and a more advanced stage of mental illness than those engaged in education, training or work. Demographics such as post-secondary education, immigrant background and indigenous background, were not significantly associated with NEET status in this sample.

Conclusions: One in five young people seeking help for mental health problems were not in any form of education, employment and training. The commonly observed risk factors did not appear to influence this association, instead, behavioural factors such as criminal offending and cannabis use appeared to require targeted intervention.

KEYWORDS

NEET, youth, unemployment, role functioning, clinical stage

ARTICLE SUMMARY

Strengths and limitations of this study

- This study is one of the first to examine the prevalence of NEET status in young Australians seeking help for mental health problems. It highlights that NEET rates in such youth (19%) are higher than that found in general population studies of Australian youth (11%).
- This study identified that NEET youth are more likely to be older males with a history of criminal offending as well as risky cannabis use. Not surprisingly, NEET youth reported greater levels of economic disadvantage and poorer social and occupational functioning. NEET youth were also more likely to have higher levels of depression and be in a more advanced stage of mental illness.
- Although this study is a cross-sectional cohort analysis, it exemplifies that 1 in 5 young people presenting to mental health services are likely to be NEET. Furthermore, previously identified demographic associations were not significantly associated with NEET status in this sample. Instead, behavioural factors such as criminal offending and cannabis use appear to require targeted interventions if the aim is to restore role functioning.
- This study was only able to identify 11% of the variance in NEET status. This strongly suggests that there are a range of other important factors that need to be investigated before NEET status is fully understood in this vulnerable group.

BACKGROUND

Participating in education and employment is considered key to the transition to successful adult wellbeing. Employment and education provides both manifest (e.g. income) and latent (e.g. time structure, social contact, sharing of common goals, status and activity, social and occupational support) benefits to an individual [1]. Individuals with low educational attainment and/or limited employment experience a greater likelihood of social exclusion [2], disability and isolation, in addition to the impacts of low income: poorer quality of life, more illness and disease [3], decreased access to healthcare, increased levels of psychological distress, and maladaptive lifestyle behaviors such as substance misuse [4-6] and criminal activity [7]. Chronic unemployment is associated with severe levels of disadvantage and carries a significant economic cost to both the individual and society including lost earnings and taxes, as well as the increased burden on welfare and healthcare systems [8].

Adolescence and early adulthood is a crucial period in which skill development and social roles are initiated. Young people who are 'Not in Education, Employment or Training' (NEET) [5] are important to clinicians, policy makers and researchers as this signifies an absolute disengagement from both the labour market and a major avenue of human development. Currently, the large majority of NEET statistics are compiled by the Organisation for Economic Co-operation and Development (OECD) who provide annual comparisons of NEET rates among general youth populations in different countries. Since the onset of the global financial crisis (mid 2007), NEET rates among young people have increased considerably [9]. In 2011, the NEET rate among Australian youth was 11% [10]: higher than the rate for the Netherlands and Denmark (approx. 5%) but lower than those countries heavily affected by the financial crisis, such as Greece and Spain (approx. 18%) and those outside the European Union e.g. Israel and Turkey (approx. 30%). While the direct causal path for NEET status has not yet been determined, longitudinal studies conducted in the United Kingdom have demonstrated that NEET status at the age of 16 years predicts NEET status at the age of 18 years [11] and is a strong predictor of chronic unemployment in adulthood [12 13]. However, the precise risk factors and trajectories of NEET status in young people remain unclear.

In population studies, certain traits are overrepresented among NEET youth. The key correlates identified to date tend to be demographic and social factors; specifically, socio-economic status, ethnic and immigration background,

parental factors (e.g., occupation, educational attainment, divorce, parental unemployment), living arrangements (e.g. not living with either parent, homelessness), negative school experiences (e.g., low educational attainment, bullying, persistent truancy, expulsion and suspension, conduct and behavioral problems, learning difficulties) and crime [14-16]. Additionally, the likelihood of being NEET increases with age and is reported as being more common among females [10 17], although some samples report higher rates among males [16]. These risk factors are derived from routinely collected information in social insurance and census databases to determine NEET status. In most cases, very little attention is paid to health or disability factors. Given that mental ill health is the primary cause of disability amongst people in OECD countries [18 19] addressing NEET status among young people with mental illness is a key concern [20].

Importantly, young people often exhibit substantial levels of disability prior to the complete manifestation of a mental disorder, reflecting either the putative prodrome of an illness [21 22] or the consequence of disengagement from employment and education [23]. A range of youth focused services, such as *headspace* in Australia, have been established to improve clinical outcomes; however, these services were also predicated upon the notion that investment in early treatment and selective prevention would produce long term socioeconomic savings [24]. The National Mental Health Commission (2013) recommended that improving social participation should also be a key outcome of such services, suggesting that clinical care must now focus on improvements beyond symptomatology. Currently, most knowledge about improving social functioning in this area is derived from studies of those with early psychosis and severe mental illness (e.g. IPS: Individual Placement and Support for early psychosis) [25]; however, the large majority of youth presenting to *headspace* experience chronic or recurrent mood, anxiety and substance abuse disorders [20]. In order to best target current and future primary health services, it is important to understand the risk profile of NEET among young people who are seeking help from these services. Such knowledge might help improve service delivery, providing opportunities for the services to intervene in the other life domains, such as employment and training, which are negatively affected by mental illness.

This study aimed to explore the prevalence of NEET status in a cross-section of young adults seeking help at a primary mental healthcare service. We wished to determine which non-clinical and clinical factors were associated with being NEET. Given that male and female youth often present with different symptom and behavioural profiles

[22], this study also aimed to determine whether the associations with NEET status were moderated by gender. By attempting to profile those who are NEET, treatment and prevention strategies can be modified accordingly.

METHOD

Sample

Between January 2011 and August 2012, all young people aged between 12 – 25 years who presented to one of four *headspace* clinics in Sydney and Melbourne (with varied demographic catchment areas) were approached for participation in a longitudinal cohort study evaluating the course of psychiatric disorders among young people, described in full elsewhere [26]. Established by the Australian Government in 2006, *headspace* centres provide youth-focused mental health and general health services, drug and alcohol services, and vocational assistance to young people aged 12–25 years. There is direct access with no need for a clinician referral and no specific catchment area. There are currently 55 centres located nationally, the four in this study being amongst the first established. The most common reasons for attendance at *headspace* are mental health problems, primarily anxiety and depressive symptoms, often in the context of psychosocial issues such as relationship conflict with family and peers [27]. As *headspace* focuses on both youth mental health and early intervention, young people may present for care with varying illness severity (e.g. from sub threshold symptoms to chronic disorders, mild to severely impaired social functioning) across a range of mental health problems [22]. Individuals with a clinician-determined intellectual disability, acute suicidality or those without fluent English were not invited to participate. A total of eight hundred and two participants were recruited. To ensure consistency with OECD descriptions of NEET status [28] and compulsory education age in Australia, participants aged below 15 years (n =106) were excluded from this study (Final N = 696).

Procedure

After the individual's initial clinical assessment, consenting participants were contacted by a research assistant (RA) via telephone or in person to discuss the nature and aims of the research. Participants provided written informed consent. Participants were assessed by RAs who held graduate degrees in psychology using a structured interview consisting of the clinical measures outlined below. RAs were trained in the use of the structured interview and achieved an inter-rater reliability score of at least 0.8 on each of the interviewer-rated clinical measures before

recruitment commenced. After the interview each participant was provided an iPad or laptop for the completion of the self-report measures. This process took approximately 1 – 2 hours to complete. Participants received a $20 gift voucher for reimbursement.

Measures

Not in Education, Employment or Training (NEET) status

Using questions from the Australian Bureau of Statistics (ABS) 2006 Census [29] participants reported if they were currently in any education, training or employment (yes/no) and how many hours per week they participated. Participants were also asked whether they had worked for payment or profit in the past month to which answers were given as: a) worked full time b) worked part-time c) did not have a job for which I received payment. To capture those who had completely disengaged from education and employment, individuals reporting that they were 'Not in any type of Education, Employment or Training in the past month' were categorised as NEET, regardless of their volunteering roles, caring roles or parenting roles.

Demographics

Participants' age, gender, immigration background, post-secondary education, indigenous background, economic hardship, criminal charges, and government assistance were assessed using self-report. To allow for comparison with other national and international NEET data, age was dichotomised: 15 – 19 years *vs*. 20 – 25 years. *Immigration background:* participants not born in Australia or those with one or both parents born overseas were classified as being of an 'immigrant background'. *Post-secondary education:* achieved by participants (none *vs*. trade, apprenticeship, certificate, diploma, university degree). *Indigenous background:* those who identified as being Aboriginal, Torres Strait Islander, or Maori. *Economic hardship:* ABS questions assessing a reported inability of an individual or their family to pay a household expense, or the deployment of dissaving behaviour such as borrowing money to do so in the previous three months. *Criminal charges:* participants reported the number and nature (e.g. assault, property damage, theft/burglary, drug use/manufacture/possession, other) of criminal charges they had ever faced by the police. *Government benefits:* participants were asked to report whether they had received any government benefits in the past three months (e.g. Youth Allowance, Disability Support Pension, Newstart,

Other). *Location of service:* The location of the *headspace* service attended by participants was recorded by administration and categorised as either 'Sydney, NSW' or 'Melbourne, Victoria.

Psychological and clinical risk factors

Substance misuse: participants' alcohol, cannabis and tobacco misuse were assessed in the clinician interview using the WHO Alcohol, Smoking and Substance Involvement Screening Test (WHO-ASSIST) [30] which provides a category of risk for a range of drugs including tobacco, alcohol and cannabis based on items 2,- 7. For cannabis and tobacco, substance involvement scores greater than 3 indicated 'at risk' participants and for alcohol, scores greater than 10. 'At risk' of misuse individuals are at risk of, or already are, experiencing health, social, financial, legal and relationship problems resulting from their substance use, and the possibility of dependence. *Childhood Onset Disorder:* participants' recall of a prior diagnosis of a disorder in childhood such as hyperactivity, autism, attention deficit disorder or conduct disorder. *Depressive symptoms:* assessed using the clinician rated Quick Inventory of Depressive Symptomatology (QIDS-C_{16}) [31] which examined the presence, during the previous seven days, of the major DSM-IV diagnostic symptoms of depression rated on a 4-point Likert scale, combined to provide total scores ranging 0 – 27. *Anxiety* was assessed by self-report using the Generalised Anxiety Disorder (GAD-7) questionnaire [32]. *Clinical Stage:* was operationalised as a clinician-rated indicator of the severity and chronicity of mental illness experienced by participants. In accordance with the criteria established by the clinical staging model [33], participants were classified as either 'Stage 1' (non-specific symptoms or attenuated syndrome) or 'Stage 2+' (first episode of discrete disorder or persistent, recurrent mental illness). Participants' level of social and neurocognitive functioning are also considered when determining clinical stage. Staging decisions were based upon the results of the clinical interview with any discrepancies resolved in consensus meetings with research assistants and clinical supervisors.

Functioning measures

Disability: using the 12 item self-report WHODAS12 questionnaire [34], participants self-rated their difficulty performing daily life activities during the past 30 days. Global scaled scores range from 0–48 with higher scores indicating a moderate to severe level of disability. *Social and Occupational Functioning:* assessed by the interviewer using the clinician-rated Social and Occupational Functioning Assessment Scale (SOFAS) which

allocated an overall functioning score ranging between 0–100, with higher score suggesting a superior level of functioning.

Analysis

This investigation used cross-sectional baseline data from a longitudinal cohort study. All statistical analyses were conducted in SPSS Version 22. Group differences between NEET and non-NEET participants were assessed using *t*-tests and simple logistic regressions for categorical variables. Levene's tests for equal variances were conducted for the continuous variables, for which none violated any assumptions. Due to the number of univariate analyses conducted, an alpha correction using the Bonferroni method was made: the adjusted alpha level for statistical significance was determined to be $p < .003$. To examine the independent associations of NEET status, a hierarchical logistic regression was conducted: NEET status was entered as the dichotomous dependent variable. All variables achieving significance at $p < .003$ in the univariate analysis were included in the first step of multivariate analysis except for self-reported disability and social and occupational functioning due to the circularity with NEET status. To control for the relationship between criminal charges and income, economic hardship was entered as a confounder. The interaction terms for gender were subsequently added in the second model. Continuous variables were centered before interaction terms were created and only centered variables are included in the multivariate analyses. Only models with non-significant Hosmer-Lemeshow goodness-of-fit tests were included.

Ethics

Ethics was granted by the Human Research Ethics Committees at the University of Melbourne and the University of Sydney.

RESULTS

Participants

In this sample of help-seeking young adults ($N = 696$, M_{age}19 years, SD: 2.8, age range: 15 – 25 years, 68% female), 58% ($n = 404$) attended *headspace* Sydney, 42% ($n = 291$) had one or both parents born overseas; 19% ($n = 129$) had a post-secondary education; 4% ($n = 28$) were Indigenous; 32% ($n = 226$) experienced economic hardship, and

17% (*n* = 117) reported one or more instances of perceived discrimination. A total of 70 participants (10%) had a history of criminal offending with 132 counts of crime reported: 36% (47) theft/burglary, 19% (25) were physical assault, 16% (21) property damage, 14% (19) were drug related, 15% (20) were 'other'. In the current sample, 19% (*n* = 133*)* were classified as at risk for alcohol, 50% (*n* = 346) for tobacco and 29% (*n* = 199) for cannabis. The mean symptom and functioning scores were: depression (QUIDS) 10.44 (SD: 5.34, range 0 – 26), anxiety (GAD) 10.10 (SD: 5.95, range 0 – 21), self-rated disability (WHODAS) 13.25 (SD: 9.39, range 0 – 47) and SOFAS 65.33 (SD: 11.61, range 30 – 95) with 13% (*n* = 91) reporting a child onset disorder and 13% (*n* = 93) classified as Clinical Stage 2+.

NEET status

A total of 19% (*n* = 130/679) of participants were classified as 'Not engaged in any Employment, Education or Training' (NEET). Among these, 68% (*n* = 88/130) had received some form of government assistance in the past three months: 26% (*n* = 34) received youth allowance, 25% (*n* = 32) received unemployed/job seekers allowance, 11% (*n* = 14) received the disability support pension, 8% (*n* = 7) received a parenting payment and one participant reported receiving 'other'. NEETs were more likely to be male and aged between 20 – 25 years (see Table 1). NEETs had higher symptom levels of depression, but not anxiety, and were more likely to be in a progressed stage of mental illness (Clinical Stage 2). NEETs reported higher levels of disability, lower levels of social and occupational functioning and higher rates of economic hardship (Table 1). NEETs were also more likely to have a history of criminal charges and risky cannabis use (but not alcohol or tobacco) than non-NEETs. Notably, NEET status was not associated with state location of centre, immigrant background, post-secondary education or indigenous background. In Model 1 of the multivariate analysis (Table 2), older age (20 – 25 years), gender (male), a history of criminal charges, cannabis risk and depressive symptoms were independently associated with NEET status. This model accounted for 10% of the variance in NEET status. Whilst Model 2 was significant overall, the addition of the gender interaction terms did not significantly improve the model fit. In particular, the association between depressive symptoms and NEET status was not moderated by gender. All of the associations found in Model 1 remained significant, confirming that NEET status was most strongly associated with older age, being male, criminal charges and depression.

DISCUSSION

In this sample of young adults with mental health problems, nearly one in five (19%) were not engaged in any education, employment or training. This rate is nearly twice that found among the general population of youth aged 15 – 24 years living in Australia (11%, OECD 2011). In the current study, those categorised as NEET had higher symptom levels of depression and a more advanced stage of mental illness: NEETs were more likely to be male, older, have a history of criminal charges and risky cannabis use. Not surprisingly, NEET participants had lower levels of social and occupational functioning, higher levels of disability and experienced greater economic hardship compared to non-NEETs. Interestingly, demographic factors commonly found to be associated with NEET status in routine population statistics [6] such as post-secondary education, immigration background, indigenous background were not significantly associated with NEET status in this sample. This suggests that although such factors may be important for young adults with reasonable mental health, these factors are less important in this restricted sample. Alternatively, mental ill-health and substance abuse may mediate or confound the impact of these demographic risks. Overall, the results find that young adults with mental health problems, particularly older males, are at high risk of being NEET and may experience a level of vocational and educational disability that is on par with some of the most disadvantaged OECD nations in the world [5].

In the current study, males were more likely to be NEET than females. This is somewhat inconsistent with OECD data which generally reports a higher prevalence of NEET status among women [10 17 28]. We suspect that this is related to the nature of the data used to ascertain NEET status on a population level by OECD countries. More often than not, NEET status includes those who partake in care giving roles such as full-time parenting. As females tend to adopt such roles in most countries, it is difficult to determine which gender is truly disengaged from a meaningful role. In countries which do account for this (e.g. Scandinavia), sex differences in NEET status are either not as profound, or are more common in men [17]. Furthermore, longitudinal cohorts from the United Kingdom [11] consistently report a higher likelihood of males being NEET. This highlights the current difficulties in comparing NEET rates and supports the need for a more cohesive approach to examining NEET status.

Of the symptom factors, depression was significantly associated with NEET status. The main association is not surprising as depressed individuals report greater restlessness, trouble concentrating and a failure to consider or plan for the future [35]. Those with depression often withdraw from social activities and relationships, decreasing the size of their social networks and severing relationships which may offer support and enhance occupational functioning. Conversely, disengagement is also likely to lead to worse mood: being NEET may exacerbate depressive symptoms, leading to greater social isolation and diminished role functioning. Although not significant, a greater proportion of those who were NEET also reported higher rates of perceived discrimination. Understanding the links between mental illness, in particular depression, stigma and role functioning is important for the development of both clinical treatments and social programs attempting to improve role functioning. However, the current findings may reflect a sample bias: mental health services such as *headspace* may be capturing those NEETs who are experiencing depressive symptoms rather than those NEET who are not.

Criminal offending and cannabis use were significantly associated with NEET status. The latter is not surprising as substance use often emerges as a risk factor for both poorer functioning and clinical symptoms in studies of youth [36-38]. As demonstrated by the current study, cannabis use may place young adults at greater risk of becoming NEET, although a trend also appears for tobacco use. As poor physical health is associated with these substances, youth focused health services must seriously account for the impact of substance use on treatment outcomes and role functioning. Innovative treatment approaches are needed as many young adults are reluctant to engage in interventions for substance use. Given the widely published link between youth unemployment and crime [39], the association between criminal offending and NEET status were also not unexpected. The precise direction of causality between these variables cannot be determined by the current study: whether criminal offending is a consequence of economic hardship (as a number of criminal offenses were for theft) [40], or representative of greater social adversity or other underlying personality traits, is unknown. Regardless, these results signify that such behavior limits the capacity for role functioning in young adults. These findings suggest that if the aim of services like *headspace* is to increase role functioning in young adults with mental health problems, simply focusing on ameliorating symptoms, predominantly anxiety and depression, may not be the best approach [24].

Limitations

This study is based on a cross-sectional sample of self-selected, help-seeking young adults with mental health problems. The findings may be limited by such selection bias although the overall level of NEET status and the gender differences in the sample are similar to those reported in the national *headspace* dataset [27]. The current study did not include a control group and as such, no comparisons can be made to youth without mental health concerns or those not seeking help. Whilst parenting or caring roles were not separated from NEET status in the current study, 14 participants (7 of which were NEET) received a parental payment from the government, suggesting that 2% of the total sample were parents. As females are more likely than males to adopt caring roles in the absence of education, employment or training, [11] future investigation may benefit from focusing on the nature of such responsibilities within similar samples of NEETs. Importantly, different associations for NEET status may be found among young adults who present to other services (e.g. justice and criminal systems) and among samples that are more culturally and ethnically diverse. As the final regression model only accounted for 11% of the variance in NEET status, a range of other factors need to be considered including the family unit, cognitive impairment [41] and occupational aspirations [42]. Future research would benefit from determining the range of other factors, both clinical and non-clinical, including the economic environment that may be related to NEET status in young adults with mental health concerns. Research with a longitudinal focus would help untangle the direction of causality and outline the trajectories of NEET status in youth.

Conclusions

This study confirms that among young adults with mental health problems, NEET status is highly prevalent [20]. The factors identified in this study suggest that when designing clinical or policy initiatives to improve role functioning among youth with mental health problems it is necessary to consider a range of clinical and non-clinical factors. Traditional clinical approaches which focus on symptoms may need to be augmented and tailored in help-seeking young adults. Multidisciplinary approaches to offending behavior and substance use are also required. Furthermore, it appears that males with mental health concerns are at considerable risk of being NEET and that *headspace* appears to be capturing these men at a later age, in a more progressed stage of mental illness and experiencing greater social dysfunction when compared to females [27]. Collaborative and integrated service centers such as *headspace* are more likely to be effective in achieving their policy objectives in the functional and economic

domains by further understanding the groups most at risk and allocating resources appropriately. However, the high proportion of youth presenting as NEET suggests that these "early intervention services" are, in many cases, not "early" enough.

Table 1. Univariate associations with NEET status among young adults seeking help for mental health problems (*n* = 679)

	NEET *n* = 130 (19%)	Non-NEET *n* = 549 (81%)		
	n (%)	*n* (%)	OR (95% CI)	*p*
Sydney	75 (58%)	314 (57%)	1.02 (0.69 – 1.50)	.92
20 – 25 years	77 (59%)	206 (30%)	2.42 (1.64 – 3.57)	**.000**
Male	62 (48%)	159 (29%)	2.24 (1.51 – 3.31)	**.000**
Immigrant background	58 (45%)	233 (42%)	1.09 (0.74 – 1.61)	.65
Indigenous background	6 (5%)	22 (4%)	1.16 (0.46 – 2.92)	.75
Criminal charges	26 (20%)	44 (8%)	2.85 (1.68 – 4.83)	**.000**
Post-secondary education	22 (17%)	107 (19%)	0.84 (0.51 – 1.39)	.50
Economic hardship	54 (42%)	172 (31%)	2.15 (1.37 – 3.39)	**.001**
Perceived discrimination	29 (22%)	88 (16%)	1.94 (1.11 – 3.38)	.02
Alcohol risk	30 (23%)	100 (18%)	1.37 (0.86 – 2.17)	.19
Tobacco risk	74 (57%)	262 (48%)	1.46 (0.99 – 2.16)	.05
Cannabis risk	50 (38%)	139 (25%)	1.94 (1.29 – 2.90)	**.001**
Child onset disorder	27 (21%)	62 (11%)	2.06 (1.24 – 3.40)	.01
Clinical stage 2+	35 (27%)	56 (10%)	3.20 (1.99 – 5.16)	**.000**
	M (SD)	M (SD)	MD (95% CI)	*p*
Anxiety score	11.35 (6.16)	9.81 (5.87)	1.54 (0.41 – 2.68)	.01
Depression score	12.62 (5.56)	9.89 (5.10)	2.72 (1.73 – 3.72)	**.000**
Self-rated disability	16.19 (9.94)	12.55 (9.12)	3.65 (1.86 – 5.43)	**.000**
SOFAS	56.14 (10.40)	67.67 (10.80)	-11.53 (-13.59 – -9.48)	**.000**

Note. **Bold =** $p < .003$. OR = Odds Ratio, CI = Confidence Interval, SOFAS: Social and Occupational Functioning Assessment Scale (range 0 - 100).

Table 2: Multivariate associations with NEET status among young adults seeking help for mental health problems (*n* = 526)

	Base model C-S $R^2 = 0.10^*$				+ Gender interaction terms C-S $R^2 = 0.11^*$			
	B (SE)	OR	95% CI	*p*	*B(SE)*	OR	95% CI	*p*
Male	0.76 (0.27)	2.13	1.26 – 3.60	**.005**	1.50 (0.46)	4.50	1.81 – 11.16	**.001**
Age 20 – 25 years	0.77 (0.26)	2.16	1.30 – 3.60	**.003**	1.04 (0.34)	2.82	1.44 – 5.51	**.002**
Economic hardship	0.47 (0.27)	1.60	0.95 – 2.69	.080	0.45 (0.27)	1.57	0.93 – 2.68	.095
Criminal charges	0.81 (0.35)	2.24	1.13 – 4.42	**.020**	1.36 (0.51)	3.84	1.43 – 10.34	**.008**
Cannabis risk	0.20 (0.27)	1.22	0.72 – 2.05	.082	0.57 (0.35)	1.78	0.90 – 3.49	.100
Depression score	0.10(0.02)	1.10	1.05 – 1.15	**.000**	0.07 (0.03)	1.07	1.01 – 1.14	**.025**
Age group*gender					-0.52 (0.52)	0.60	0.22 – 1.65	.318
Criminal charges*gender					-0.97 (0.70)	0.38	0.10 – 1.47	.161
Cannabis risk*gender					-0.92 (0.55)	0.39	0.13 – 1.17	.094
Depression*gender					0.07 (0.05)	1.07	0.97 – 1.18	.191

Note: * $p < .001$ **bold** = $p < .05$. Base Model: Nag $R^2 = 0.16$, -2LL: 428.76, Model χ^2 (6) = 52.67, $p < .001$, Step 2 (+ Gender Interaction Terms): Nag $R^2 = 0.18$, -2LL: 419.89, Model χ^2 (10) = 61.54, $p < .001$, $\Delta\chi^2$ (4) = 8.87, $p = .064$.

Contributorship Statement: The study was designed and conducted by PM, IH, NG, DH, RP, EK, AY, AG, ES. The analysis of data and interpretation was conducted by BOD, KLF, NG. The paper was prepared by BOD, NG, and KLF and critically revised by PM, IH, JS, DH, RP, EK, AY, ES, AG, JB. The other investigators on the Transitions Study were A. Jorm, E. Killackey, L. Phillips, S.W. Wood, A. Mackinnon, E. Scott, A. Yung, A. Kenyon, L. Mundy, A. Nichles, A, Scaffidi, D. Spiliotacopoulos, L. Taylor, J.P.Y Tong, S. Wiltink, N. Zmicerevska, and A. Guastella. This study was conducted at Brain and Mind Research Institute, University of Sydney and Orygen Youth Health Research Centre, Melbourne.

Competing Interests: Professor Hickie is a Board Member of Psychosis Australia Trust. From 2012, he has been a Commissioner in Australia's new National Mental Health Commission. He was until January 2012 a director of headspace: the national youth mental health foundation. Prof Hickie was previously chief executive officer (till 2003) and clinical adviser (till 2006) of beyondblue, an Australian National Depression Initiative. He is supported principally for clinical research in depression and health services and population health initiatives related to anxiety and depression by an NHMRC Australian Medical Research Fellowship (2007–12) and now by an NHMRC Senior Principal Research Fellowship (2013-17). He has led projects for health professionals and the community supported by governmental, community agency and pharmaceutical industry partners (Wyeth, Eli Lily, Servier, Pfizer, AstraZeneca) for the identification and management of depression and anxiety. He has received honoraria for presentations of his own work at educational seminars supported by a number of nongovernment organisations and the pharmaceutical industry (including Pfizer, Servier and Astra Zeneca). He has served on advisory boards convened by the pharmaceutical industry in relation to specific antidepressants, including nefazodone, duloxetine, and desvenlafaxine. He leads an investigator-initiated study of the effects of agomelatine on circadian parameters (supported in part by Servier but also by other NHMRC funding) and has participated in a multicentre clinical trial of agomelatine effects on sleep architecture in depression and a Servier-supported study of major depression and sleep disturbance in primary care settings. In addition to national and international Government-based grant bodies, investigator-initiated mental health research at the BMRI he has been supported by various pharmaceutical manufacturers (including Servier and Pfizer) and not-for-profit entities (including the Heart Foundation, beyondblue and the BUPA Foundation). All other authors declare no conflicting interests.

Funding: The study was supported by an NHMRC Program Grant (ID: 566529).

Data sharing: The dataset for this study is not currently publically available; however, all statistical code can be reviewed by contacting the corresponding author bridianne.odea@sydney.edu.au

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STROBE 2007 (v4) Statement—Checklist of items that should be included in reports of *cross-sectional studies*

Section/Topic	Item #	Recommendation	Reported on page #
Title and abstract	1	(*a*) Indicate the study's design with a commonly used term in the title or the abstract	2
		(*b*) Provide in the abstract an informative and balanced summary of what was done and what was found	2
Introduction			
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	4-5
Objectives	3	State specific objectives, including any prespecified hypotheses	6
Methods			
Study design	4	Present key elements of study design early in the paper	6
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	6
Participants	6	(*a*) Give the eligibility criteria, and the sources and methods of selection of participants	6
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	7-9
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	7-9
Bias	9	Describe any efforts to address potential sources of bias	*6*
Study size	10	Explain how the study size was arrived at	6
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	9
Statistical methods	12	(*a*) Describe all statistical methods, including those used to control for confounding	9
		(*b*) Describe any methods used to examine subgroups and interactions	9
		(*c*) Explain how missing data were addressed	9
		(*d*) If applicable, describe analytical methods taking account of sampling strategy	9
		(*e*) Describe any sensitivity analyses	9
Results			

Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	10
		(b) Give reasons for non-participation at each stage	na
		(c) Consider use of a flow diagram	na
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	10
		(b) Indicate number of participants with missing data for each variable of interest	10
Outcome data	15*	Report numbers of outcome events or summary measures	10
Main results	16	(*a*) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included	10-11
		(*b*) Report category boundaries when continuous variables were categorized	10-11
		(*c*) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	na
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	na
Discussion			
Key results	18	Summarise key results with reference to study objectives	11
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	13
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	11-13
Generalisability	21	Discuss the generalisability (external validity) of the study results	13
Other information			
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	18

*Give information separately for cases and controls in case-control studies and, if applicable, for exposed and unexposed groups in cohort and cross-sectional studies.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at http://www.plosmedicine.org/, Annals of Internal Medicine at http://www.annals.org/, and Epidemiology at http://www.epidem.com/). Information on the STROBE Initiative is available at www.strobe-statement.org.