

# Ethnicity and baseline symptomatology in patients with an At Risk Mental State for psychosis

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**Background.** Ethnicity has been associated with different incidence rates and different symptom profiles in young patients with psychotic-like disorders. No studies so far have examined the effect of ethnicity on symptoms in people with an At Risk Mental State (ARMS).

**Method.** In this cross-sectional study, we analysed the relationship between ethnicity and baseline data on the severity of psychopathology scores in 201 help-seeking patients who met the ARMS criteria and agreed to participate in the Dutch Early Detection and Intervention (EDIE-NL) trial. Eighty-seven of these patients had a non-Dutch ethnicity. We explored the possible mediating role of ethnic identity.

**Results.** Higher rates of negative symptoms, and of anhedonia in particular, were found in the ethnic minority group. This result could be attributed mainly to the Moroccan-Dutch and Turkish-Dutch subgroups, who also presented with more depression symptoms when the groups were examined separately. The ethnic minority group displayed a lower level of ethnic group identity compared to the immigrants of the International Comparative Study of Ethnocultural Youth (ICSEY). Ethnic identity was inversely related to symptoms in the Moroccan-Dutch patient group.

**Conclusions.** The prevalence of more severe negative symptoms and depression symptoms in ethnic minority groups deserves more attention, as the experience of attenuated positive symptoms when accompanied by negative symptoms or distress has proven to be predictive for transition to a first psychotic episode.

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## Introduction

Psychotic illness is more prevalent in migrant and minority ethnic groups (Veling *et al.* 2007; Kirkbride *et al.* 2008; Morgan *et al.* 2010). The association between being a member of an ethnic minority group and incidence of psychotic disorders is typically linked to a greater exposure to adverse social experiences among minorities, such as racial discrimination or social isolation during their life course (Selten & Cantor-Graae, 2005; Veling *et al.* 2007; Morgan & Hutchinson, 2010).

Although higher incidences of psychotic disorders in ethnic minority groups are reported consistently,

the literature about ethnic variation in clinical characteristics is less unequivocal. Several studies suggest that ethnic differences are not limited to differences in incidence rates, but that variations could also be observed in the symptom profile. Higher rates of hallucinations, paranoid delusions and affective symptoms have been found in psychotic patients of certain ethnic minority groups compared to the native patient group (Strakowski *et al.* 1996; Bhugra *et al.* 2000; Barrio *et al.* 2003; Arnold *et al.* 2004; Veling *et al.* 2007). Two studies from the UK, however, have reported more similarities than differences in terms of symptom profile (Harvey *et al.* 1990; Hutchinson & Sharpley, 1999). In fact, no major ethnic differences were found in any of the schizophrenia core features.

In The Netherlands, one study of a first-psychosis cohort has examined the differences between ethnic minorities and native Dutch patients in symptom profile in a group of patients with a first mental health

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contact for a psychotic disorder (Veling *et al.* 2007). The Moroccan-Dutch patient group was found to have significantly higher total psychopathology, positive and negative symptom scores compared to the Dutch patient population. In particular, patients originating from Morocco presented more often with persecutory delusions, bizarre behaviour and visual hallucinations. In addition, Moroccan-Dutch and Turkish-Dutch patient groups both had higher levels of depression. In other ethnic minority groups, no significant differences were found.

To the best of our knowledge, the relationship between ethnicity and symptoms in adolescents and young adults with an At Risk Mental State (ARMS; Yung *et al.* 2005) for developing psychosis has not yet been investigated. Because variation in psychotic phenomenology might reflect different aetiological pathways to psychosis in migrant and minority ethnic groups (Morgan *et al.* 2010), differences in ARMS symptomatology in young people might indicate different treatment targets for psychosis prevention in future treatment models.

In the present cross-sectional study, we aimed to investigate whether ethnic differences found in patients with a psychotic disorder (Veling *et al.* 2007) are also present in patients with an ARMS for developing a first psychosis. We hypothesized that (1) no significant results would be found when examining symptomatic differences between Dutch patients and the whole ethnic minority group; (2) the Moroccan-Dutch group would display (a) more severe total psychopathology, (b) more negative symptoms and (c) more paranoid ideas than the native Dutch patient group; and (3) the Moroccan-Dutch and Turkish-Dutch groups would report more depression symptoms.

This study also examined possible factors that could contribute to symptomatic differences in a more exploratory way. In a large matched case-control study of first-episode schizophrenia among non-Western ethnic minorities in The Netherlands (Veling *et al.* 2010), a higher group identity has been found to protect against the onset of psychosis (for an elaboration on the concept of ethnic identity, see Berry *et al.* 2006; Veling *et al.* 2010). In the present study, we therefore sought to investigate whether ethnic group identity could also affect the manifestation of symptoms in subjects with an ARMS.

## Method

### *Classification of ethnicity*

In accordance with the study by Veling *et al.* (2010) we used the classification of ethnicity as defined by the Dutch Bureau of Statistics: if a citizen, or (one of)

his/her parents was born abroad, he or she is assigned to this foreign ethnicity group. If the parents were born in different foreign countries, the country where the mother was born determines the assignment to a particular group. We first divided our patient cohort into a 'Dutch' group and a group of all adolescents with another ethnicity: the 'Ethnic Minority' group. For exploratory purposes, we then divided our study population into six categories: native-Dutch, Moroccan-Dutch, Turkish-Dutch, Surinamese-Dutch, other Western, and other Non-Western minority groups.

### *Recruitment*

Between February 2008 and March 2010, baseline data were collected from 201 help-seeking patients who met the ARMS criteria (Yung *et al.* 1996, 2003) and agreed to participate in the Dutch Early Detection and Intervention (EDIE-NL) trial (Rietdijk *et al.* 2010). The EDIE-NL is a longitudinal multicentre randomized controlled trial comparing treatment as usual (TAU) with an add-on cognitive behavioural therapy (CBT), aiming at the prevention of a first psychosis. A comprehensive description of the EDIE-NL treatment model can be found in Rietdijk *et al.* (2010).

Young people were eligible for the study if they were aged between 14 and 35 years and met at least one of the following criteria for an ARMS for the development of a first psychotic episode, as defined by the Personal Assessment and Crisis Evaluation Clinic (PACE) criteria (Yung *et al.* 1998, 2003): (1) a schizotypal personality disorder and/or a first-degree relative with psychosis (the 'Vulnerability group'); (2) attenuated positive symptoms, such as ideas of reference, odd beliefs/magical thinking or unusual perceptual experiences; and (3) a brief psychotic episode lasting less than 1 week that resolves without antipsychotic medication (Brief Limited Intermittent Psychotic Symptoms, BLIPS). In addition, in all three inclusion groups, there had to be impairment in social functioning as assessed with the Social and Occupational Functional Assessment Scale (SOFAS; Goldman *et al.* 1992); that is, a SOFAS score of <50 in the past 12 months or longer and/or a drop in SOFAS score of 30% for at least 1 month in the past year.

Exclusion criteria were: (1) current or previous usage of antipsychotic medication defined as a total cumulative dosage above 15 mg haloperidol equivalents; (2) severe learning impairment (IQ <70); (3) psychiatric symptoms due to somatic aetiology; (4) insufficient competence in the Dutch language; and (5) a history of psychosis.

The study design was approved by the Dutch Union of Medical Ethics Trial Committees for mental health

organizations and the Medical Ethical Committees of all participating centres. The trial is registered at Current Controlled trials as trial number ISRCTN21353122. Written consent from participants and parents or guardians (if the participant was below the age of 16 years) was obtained after the procedure had been fully explained.

### **Instruments**

#### *ARMS symptomatology*

The Comprehensive Assessment of At Risk Mental States (CAARMS; Yung *et al.* 2005), including the SOFAS, was used to determine the presence, severity, frequency and type of ARMS symptoms. This instrument consists of a semi-structured interview designed to assess the ARMS criteria and has excellent proven validity and reliability (Yung *et al.* 2005). The CAARMS consists of seven subscales that include: four Positive Symptom items, two Cognitive and three Emotional Disturbances items, three Negative Symptoms items, four Behavioural Change items, four Motor/Physical Changes items and eight General Psychopathology items. Symptomatic criteria for ARMS are based exclusively on positive symptom items.

The EDIE-NL investigators received 2 days of training by Professor A. Yung, who developed the CAARMS criteria. Reliability checks of the Dutch version of the CAARMS were performed approximately every 3 months during the study. The preliminary pairwise inter-rater concordance of the intensity subscales of the CAARMS was 0.81, which was considered acceptable by the training team.

The analyses of the present study were based upon the sum score of the positive and negative items of the CAARMS. In addition, the total sum score was used, representing a global psychopathology rating.

The SOFAS (Goldman *et al.* 1992) was used to determine the level of social and occupational functioning. This scale, ranging from 0 to 100, is a modified version of the Global Assessment of Functioning (GAF) scale, separating the measures of social and occupational functioning from the measures of symptoms and psychological functioning.

#### *Co-morbidity*

Co-morbid diagnoses were examined by means of the Schedule for Clinical Assessment in Neuropsychiatry (SCAN; Wing *et al.* 1990). In addition, depression was self-reported on the Beck Depression Inventory II (BDI-II; Beck *et al.* 1996) and assessed by means of the Calgary Depression Scale (CDS), a nine-item structured interview scale designed to assess the severity

of depression in people with psychotic disorders (Addington *et al.* 1992).

#### *Ethnic and national identity*

Ethnic identity and national identity were assessed with the ordinal International Comparative Study of Ethnocultural Youth (ICSEY) scale. This is a 10-item version of the Multigroup Ethnic Identity Measure (Phinney, 1992) with response options ranging from 'strongly disagree' (1) to 'strongly agree' (5), assessing ethnic and national affirmation, sense of belonging and feelings about being a member of a group (e.g. 'Being part of ethnic culture is embarrassing to me'). National identity is the identity as a member of the larger society (in this study: Dutch identity). We compared our mean scores per item with the mean scores of a group of young immigrants (aged 13–18 years, mean age 15.4 years) in the Dutch population of the ICSEY, a study among more than 10 000 adolescents from 13 countries, including Surinamese, Turkish and Antillean immigrants in The Netherlands (Berry *et al.* 2006).

#### *Statistical analysis*

Statistical analysis was performed with SPSS version 18.0 (SPSS Inc., USA). Comparisons of baseline characteristics between the ethnic minority group and the Dutch group were made with Pearson's  $\chi^2$  tests and independent sample *t* tests. We used Cohen's *d* tests to examine differences in the levels of ethnic and national identity between our ethnic minority population and the immigrants of the ICSEY. Partial correlation was used to explore the relationship between ethnic and national identity and the different symptom clusters.

To assess baseline differences in symptomatology between the ethnic minority and the native Dutch population while controlling for possible confounders, a one-way between-group analysis of covariance was conducted. The independent variable was the ethnic background and the dependent variables consisted of ARMS symptomatology scores. Age, gender, employment status, educational level, cannabis use over the past 12 months, and the use of benzodiazepines and antidepressants were used as covariates in the analyses. Preliminary checks were conducted to ensure that there was no violation of the assumptions of normality. Potential confounders were initially tested one by one in univariate analyses for their effect on the outcome variable.

We conducted univariate analyses in the five different ethnic subgroups to examine the differences in symptomatology compared to the Dutch group.

**Table 1.** Characteristics of the study sample<sup>a</sup>

	<i>n</i>	Ethnic minority group <sup>b</sup> ( <i>n</i> =87)	Dutch group ( <i>n</i> =114)	Statistics
<b>Age (years)</b>	201	<b>24.5±5.5</b>	<b>21.4±5.2</b>	<b><i>t</i> = -4.0, <i>p</i> &lt; 0.0001</b>
Male	201	39 (44.8)	60 (52.6)	$\chi^2 = 1.2, p = 0.27$
First-degree relative with psychosis	201	20 (23.0)	15 (13.2)	$\chi^2 = 3.3, p = 0.07$
Paid full- or part-time job/education	201	60 (69.0)	85 (74.6)	$\chi^2 = 0.78, p = 0.38$
Cannabis use (past 12 months) <sup>c</sup>	201	27 (31.0)	43 (37.7)	$\chi^2 = 0.97, p = 0.32$
Medication use				
Antidepressants	201	25 (28.7)	31 (27.2)	$\chi^2 = 0.06, p = 0.81$
Benzodiazepines	201	14 (16.1)	12 (10.5)	$\chi^2 = 1.4, p = 0.24$
Level of education	201			$\chi^2 = 2.4, p = 0.12$
No education/primary school		0	0	
Secondary school		31 (35.6)	53 (46.5)	
Higher education		56 (64.4)	61 (53.5)	
<b>Site</b>	201			<b><math>\chi^2 = 21.2, p = 0.001</math></b>
The Hague (Parnassia/VU)		52 (55.9)	41 (44.1)	
Amsterdam (AMC)		19 (47.5)	21 (52.5)	
Friesland (GGZ)		4 (13.3)	26 (86.7)	
Leiden		7 (35.0)	18 (65.0)	
Amsterdam (PsyQ)		5 (45.5)	6 (55.5)	
Utrecht		0	2 (100)	
DSM-IV diagnosis	197			
Mood disorder		45 (53.6)	52 (46.0)	$\chi^2 = 1.1, p = 0.29$
<b>Anxiety disorder</b>		<b>53 (63.1)</b>	<b>52 (46.0)</b>	<b><math>\chi^2 = 5.6, p = 0.02</math></b>
Sleeping disorder		21 (25.0)	19 (16.8)	$\chi^2 = 2.0, p = 0.16$
Obsessive-compulsive disorder		3 (3.6)	5 (4.4)	$\chi^2 = 0.09, p = 0.76$
<b>Eating disorder</b>		<b>4 (4.8)</b>	<b>0</b>	<b><math>\chi^2 = 5.5, p = 0.02</math></b>
Bipolar disorder		2 (2.3)	1 (0.8)	$\chi^2 = 0.72, p = 0.40$
Other <sup>d</sup>		4 (4.8)	8 (7.1)	$\chi^2 = 0.45, p = 0.50$
Ethnic identity <sup>e</sup>	87	3.81 (1.0)		
National identity <sup>e</sup>	87	3.90 (1.1)		

Values given as mean ± standard deviation or *n* (%).

<sup>a</sup> Significant at the 0.05 level.

<sup>b</sup> Ethnic minority group: Moroccan (*n*=22), Turkish (*n*=13), Surinamese (*n*=16), other Western (*n*=14), other Non-Western (*n*=22).

<sup>c</sup> Cannabis use was defined as having used cannabis more than five times during a lifetime and at least once in the past 12 months (CIDI; WHO, 1993).

<sup>d</sup> Includes multiple substance abuse, pain disorder and conversion disorder.

<sup>e</sup> Ethnic identity and national identity were assessed with the ordinal International Comparative Study of Ethnocultural Youth (ICSEY) Scale of Ethnic and National Identity (Phinney, 1992).

Missing data ( $\leq 5\%$ ) were imputed using the Expectancy Maximization procedure of SPSS for Windows. *Post-hoc* analyses were conducted with Tukey HSD tests. A *p* value of  $\leq 0.05$  was considered statistically significant.

## Results

### Subject characteristics

Table 1 lists the characteristics of our study sample. Over the 2 years of inclusion, 201 subjects met the

inclusion criteria and agreed to participate in the EDIE-NL trial (99 males, overall mean age 22.7 years, s.d.=5.5). Eighty-seven participants had a foreign ethnicity (43%); and of these, 30 (34.5%) were first-generation and 57 (65.5%) second-generation migrants. A total of 192 (90%) patients displayed Attenuated symptoms, of whom 28 also met the 'Vulnerability' criterion and one reported BLIPS. Six (3.0%) patients only met the 'Vulnerability' criterion and another three (1.5%) only belonged to the BLIPS group. The ethnic minority group did not differ significantly from the Dutch patient group in terms of

**Table 2.** Differences in ARMS symptomatology between young people with a Dutch and an ethnic minority background

	Ethnic minority <sup>a</sup> ( <i>n</i> = 87)	Dutch ( <i>n</i> = 114)	Unadjusted <i>t</i> , <i>p</i>	Adjusted <sup>b</sup> <i>F</i> , <i>p</i>
CAARMS total psychopathology	56.5 (13.9)	49.4 (16.6)	<b><i>t</i> = 3.25, <i>p</i> = 0.001</b>	<i>F</i> (1, 191) = 2.42, <i>p</i> = 0.12
Positive symptoms	10.2 (2.7)	10.4 (2.8)	<i>t</i> = -0.55, <i>p</i> = 0.58	<i>F</i> (1, 192) = 1.65, <i>p</i> = 0.20
<b>Negative symptoms</b>	<b>8.1 (3.1)</b>	<b>6.4 (3.6)</b>	<b><i>t</i> = 3.76, <i>p</i> &lt; 0.0001</b>	<b><i>F</i>(1, 191) = 6.36, <i>p</i> = 0.01</b>
Alogia	1.4 (1.2)	1.1 (1.2)	<i>t</i> = 1.34, <i>p</i> = 0.18	<i>F</i> (1, 191) = 0.75, <i>p</i> = 0.39
Avolition	3.4 (1.3)	2.7 (1.6)	<b><i>t</i> = 3.06, <i>p</i> = 0.003</b>	<i>F</i> (1, 191) = 3.28, <i>p</i> = 0.07
<b>Anhedonia</b>	<b>3.4 (1.5)</b>	<b>2.5 (1.8)</b>	<b><i>t</i> = 3.80, <i>p</i> &lt; 0.0001</b>	<b><i>F</i>(1, 191) = 7.41, <i>p</i> = 0.007</b>
SOFAS	45.5 (5.2)	46.5 (4.8)	<i>t</i> = -1.45, <i>p</i> = 0.15	<i>F</i> (1, 192) = 3.56, <i>p</i> = 0.06
BDI-II sum score	45.7 (13.1)	40.4 (11.3)	<b><i>t</i> = 3.08, <i>p</i> = 0.002</b>	<i>F</i> (1, 190) = 2.80, <i>p</i> = 0.10
CDS sum score	7.1 (4.9)	5.4 (4.5)	<b><i>t</i> = 2.43, <i>p</i> = 0.02</b>	<i>F</i> (1, 186) = 1.35, <i>p</i> = 0.25

ARMS, At Risk Mental State; CAARMS, Comprehensive Assessment of At Risk Mental States; SOFAS, Social and Occupational Functional Assessment Scale; BDI-II, Beck Depression Inventory II; CDS, Calgary Depression Scale.

Ranges: CAARMS Total psychopathology (0–168); CAARMS Positive symptoms (0–24); CAARMS Negative symptoms (0–18); CAARMS Alogia (0–6); CAARMS Avolition (0–6); CAARMS Anhedonia (0–6); SOFAS (0–100); BDI-II sum score (21–84); CDS sum score (0–27).

Values given as mean (standard deviation).

<sup>a</sup> Ethnic minority = Moroccan (*n* = 22), Turkish (*n* = 13), Surinamese (*n* = 16), other Western (*n* = 14), other Non-Western (*n* = 22).

<sup>b</sup> Adjusted for potential confounders: age, gender, medicine use, cannabis use, employment status and level of education. Significant variables are shown in bold.

the inclusion group they were assigned to, gender, cannabis use during the 12 months prior to baseline, employment status, positive symptoms and SOFAS score. The percentage of ethnic minority patients in each participating centre corresponded to the ethnic variation in the local population.

Compared to the ethnic minority group (mean age 24.5 years, *s.d.* = 5.5), the Dutch group was significantly younger at baseline (mean age 21.4 years, *s.d.* = 5.2). In addition, we found the ethnic minority group to be more often diagnosed with an anxiety disorder ( $\chi^2 = 5.6$ , *p* = 0.02) and an eating disorder ( $\chi^2 = 5.5$ , *p* = 0.02).

### Baseline symptomatology

Univariate analyses showed highly significant associations between being a member of an ethnic minority group and total psychopathology scores (*p* = 0.001) and negative symptoms (*p* < 0.0001; Table 2). The difference in negative symptoms was mainly due to higher rates of anhedonia (*p* = 0.003) within the ethnic minority group compared to the Dutch group. In addition, the ethnic minority group reported more depression (*p* = 0.002) and more social anxiety symptoms (*p* = 0.01). The higher depression rates were not only self-reported but also confirmed by clinical assessment (CDS; *p* = 0.02). In the model, controlled for age, gender, employment status, educational level,

cannabis use over the past 12 months, and the use of benzodiazepines and antidepressants, the significant associations remained for the negative symptoms sum score (*p* = 0.01) and subscale anhedonia (*p* = 0.007) only. Controlling for BDI-II sum score [negative symptoms sum score *F*(1, 186) = 5.83, *p* = 0.02; anhedonia *F*(1, 186) = 5.83, *p* = 0.02], these differences were still significant.

### Exploratory analyses

#### Role of possible confounding factors

By examining the effect on the outcome variables of the potential covariates in the model (i.e. age, gender, employment status, educational level, cannabis use over the past 12 months, and the use of benzodiazepines and antidepressants), we found the older age of the other ethnicity group to have the largest impact on baseline symptomatology; all other factors entered in the model did not significantly change any of the symptom scores. After controlling for age, only the ethnic differences in negative symptoms remained significant [*F*(1, 192) = 6.39, *p* = 0.01]. The differences in total psychopathology (*F* = 2.60, *p* = 0.11), BDI-II (*F* = 2.70, *p* = 0.10) and CDS (*F* = 1.65, *p* = 0.20) lost their significance. No main effect of gender or interaction effects between gender and ethnicity were found.

**Table 3.** Severity of psychopathology in patients ( $n=201$ ) from different ethnic groups making first contact for ARMS symptoms

	Dutch ( $n=114$ )	Moroccan ( $n=22$ )	Turkish ( $n=13$ )	Surinamese ( $n=16$ )	Other Western ( $n=14$ )	Other Non- Western ( $n=22$ )	Adjusted <sup>a</sup> $F$ , $df$ , $p$
Total psychopathology	49.4 (16.6)	58.4 (14.7)	61.5 (15.2)	55.5 (12.5)	46.6 (11.8)	58.5 (12.5)	$F(5, 185)=0.91, p=0.48$
Positive symptoms	10.4 (2.8)	9.4 (2.5)	11.2 (2.9)	10.0 (2.6)	9.8 (3.3)	10.6 (2.4)	$F(5, 186)=0.89, p=0.49$
Negative symptoms	6.4 (3.6)	<b>9.1 (3.1)</b>	8.7 (2.4)	7.7 (3.5)	5.9 (2.9)	<b>8.5 (2.6)</b>	<b><math>F(5, 185)=2.24, p=0.05</math></b>
Alogia	1.1 (1.2)	1.3 (1.4)	1.4 (1.3)	1.8 (1.3)	0.6 (0.9)	1.6 (1.1)	$F(5, 185)=1.91, p=0.09$
Avolition	2.7 (1.6)	3.8 (1.1)	3.5 (1.1)	3.0 (1.4)	2.6 (1.4)	3.6 (1.3)	$F(5, 185)=1.36, p=0.24$
Anhedonia	2.5 (1.8)	<b>4.1 (1.3)</b>	3.9 (1.4)	2.9 (1.5)	2.7 (1.7)	3.3 (1.6)	<b><math>F(5, 185)=2.48, p=0.03</math></b>
SOFAS	46.5 (4.8)	45.3 (4.9)	47.4 (3.5)	45.6 (4.8)	44.3 (5.3)	45.1 (6.4)	$F(5, 185)=0.98, p=0.43$
BDI-II	40.4 (11.3)	<b>48.9 (11.0)</b>	<b>53.2 (12.5)</b>	38.7 (13.6)	40.1 (13.5)	46.6 (12.0)	<b><math>F(5, 184)=2.47, p=0.03</math></b>
CDS	5.4 (4.5)	8.6 (4.7)	8.1 (4.8)	6.5 (5.3)	5.6 (5.6)	6.3 (4.4)	$F(5, 180)=0.66, p=0.66$

ARMS, At Risk Mental State; SOFAS, Social and Occupational Functional Assessment Scale; BDI-II, Beck Depression Inventory II; CDS, Calgary Depression Scale;  $df$ , degrees of freedom.

Values given as mean (standard deviation).

Significant outcomes are shown in bold.

Outcomes significant with *post-hoc* analyses are shown in italics.

<sup>a</sup> Unadjusted means are shown. Statistical analyses were corrected for age, gender, cannabis use, use of medication, employment status and education level.

#### Symptomatology in different ethnic minority groups

We examined the symptomatic differences after dividing our ethnic minority group into five smaller subgroups (Table 3). We observed overall statistically significant differences in the negative symptoms total score [ $F(5, 185)=2.24, p=0.05$ ], the negative symptom cluster anhedonia [ $F(5, 185)=2.48, p=0.03$ ] and self-reported symptoms of depression [ $F(5, 184)=2.47, p=0.03$ ].

*Post-hoc* comparisons using the Tukey HSD test indicated that the differences in negative symptom scores can be attributed mainly to the higher scores in the Moroccan-Dutch as compared to the Dutch population (Negative symptoms; total score, mean difference = 2.78,  $s.e.=0.72, p=0.002$ ; Anhedonia: mean difference = 1.58,  $s.e.=0.37, p=0.001$ ; and Avolition: mean difference = 1.04,  $s.e.=0.30, p=0.009$ ). The significance levels did not change after controlling for depression, as assessed with the BDI-II total score. The total score of the negative symptom cluster was also increased in the other Non-Western minority group (mean difference = 2.14,  $s.e.=0.72, p=0.04$ ). The overall significant difference in self-reported depression scores was caused by the higher scores of both the Moroccan-Dutch and the Turkish-Dutch populations (BDI-II: mean difference = 8.50,  $s.e.=2.33, p=0.005$  and mean difference = 12.74,  $s.e.=2.93, p<0.0001$  respectively). Although no other overall differences were found, *post-hoc* analyses concerning all five ethnic groups independently showed higher

levels of total psychopathology scores within the Turkish-Dutch population (mean difference = 12.03,  $s.e.=3.98, p=0.03$ ). In addition, the Moroccan-Dutch patient group showed higher scores on the CDS (mean difference = 3.17,  $s.e.=0.99, p=0.02$ ).

#### Ethnic and national identity

The mean ( $s.d.$ ) scores for ethnic and national identity were compared with those of the multi-ethnic cohort of 349 young people from The Netherlands (ICSEY; Berry *et al.* 2006), who showed an ethnic identity score of 4.54 (0.06) and a national identity score of 3.19 (0.04). In comparison to the youth of the ICSEY, our ethnic minority group reported scores indicating a lower ethnic identity and a higher national identity (Cohen's  $d$  -1.0 and 0.9 respectively; see Table 1).

The level of ethnic identity was not associated with any of the symptom clusters when looking at the ethnic minority groups taken together. Exploratory analyses of the largest subgroups (i.e. the Moroccan-Dutch and the other Non-Western minority group) suggested associations between a higher ethnic identity in the Moroccan-Dutch group and less severe total psychopathology scores ( $r=-0.69, df=13, p=0.005$ ), a lower score on the negative symptoms sum score ( $r=-0.63, df=13, p=0.01$ ), and a lower score on anhedonia ( $r=-0.64, df=13, p=0.01$ ) and alogia ( $r=-0.53, df=13, p=0.04$ ). No correlations were found in the other Non-Western minority group.

## Discussion

### Main findings

To our knowledge, this is the first study to examine ethnic differences in baseline symptomatology in a large cohort of patients with an ARMS for developing psychosis. In accordance with a Dutch first-psychosis study by Veling *et al.* (2007), we hypothesized that no significant differences in symptomatology would be found between the native Dutch and the whole ethnic minority group. This hypothesis was partially supported. Although no baseline differences were found in total psychopathology scores, positive symptoms and depression symptoms, we did find higher negative symptom scores in the ethnic minority group after controlling for possible confounders. First- and second-generation immigrants from Morocco largely accounted for the difference in negative symptoms between the ethnic minority group and the native Dutch group, particularly because of their higher rates of avolition and anhedonia. The Moroccan-Dutch and Turkish-Dutch ARMS subjects were found to report more depression symptoms than the native Dutch patients.

Although higher levels of negative symptoms and depression were found in non-Western groups within The Netherlands, we were not able to replicate the findings regarding higher levels of symptomatology and persecutory ideas. An explanation might be the heterogeneity of our sample. Not only are the paranoid ideations of our whole sample by definition less severe than those in a first-psychosis group, a large part of the ARMS group will very probably eventually recover from their symptoms (Simon & Umbricht, 2010; Velthorst *et al.* 2011) or will go on to develop another disorder.

### Ethnic identity

One of the mechanisms that is considered to be a possible contributor to symptomatic differences is the concept of ethnic identity. Therefore, in our study we compared the level of ethnic group identity with a large group of immigrants in The Netherlands and found that our group displaying a weaker ethnic group identity, which is in congruence with the idea that weak group identity can cause distress and symptoms that possibly arise from (vulnerability for) socially adverse experiences. Higher levels of distress might reduce someone's interest in participating in daily activities and cause them to withdraw from social contact. Albeit very preliminary, the association between lower negative symptom levels and higher levels of group identity within the Moroccan-Dutch

group supports this idea, and is in accordance with the theory previously suggested by Veling *et al.* (2010).

However, the findings are still equivocal with respect to the direction of the possible effect of ethnic group identity and psychotic symptomatology. Of note, both a weak (Veling *et al.* 2010) and an increased identification with one's own ethnic group (Reininghaus *et al.* 2010) have been suggested to increase the negative effect of ethnicity on psychosis. A possible explanation for this contradiction may be a varying relationship between strong ethnic identity and access to support networks (Reininghaus *et al.* 2010). Although a strong ethnic identity may be associated with easy access to social support networks in one group/country (e.g. The Netherlands), strong ethnic identity may instead represent compound risk in other groups or countries.

The mechanism behind the complex association between ethnic identity, distress and symptoms warrants further research, as the association found could have two possible explanations: although both Reininghaus *et al.* (2010) and Veling *et al.* (2010) emphasize the influence that ethnic identity may have on distress, it is not inconceivable that distress or experiences of defeat could alternatively lead to weak group identity.

### Cultural background

Despite the above-mentioned ethnic identity hypothesis, it is plausible that the manifestation of symptoms may also, at least partly, be influenced by someone's cultural background (Veling *et al.* 2007; Zandi *et al.* 2010). Although our results show that suffering from depression symptoms seems to be a common phenomenon within the Moroccan population, it has been argued that giving in to such feelings is a taboo in this culture (Zandi *et al.* 2010), and this might even be more applicable in case of psychotic-like experiences. Feelings of shame may further reinforce (social) indifference, leading to high scores on the subscale 'anhedonia' on the CAARMS for example.

Furthermore, shame and stigma in families might interfere with seeking help early (Rathod *et al.* 2010), preventing individuals from seeking help before distress and complaints become much worse. This hypothesis would account for the older age and higher psychopathology scores among the ethnic minority group.

### Methodological considerations and limitations

A limitation of this study is that it is not known whether the migrants in this sample of ARMS patients do represent those who develop a psychotic disorder.

In this connection, the sex ratio in our ARMS sample (39% male) was very different from that in the Veling *et al.* (2007) study (72% male). However, our aim was to detect patients susceptible for psychosis in any spectrum. Females are prone to psychosis to a similar extent as males, but more for psychosis as part of a mood disorder rather than a schizophrenia spectrum disorder. Future transition data should reveal whether a higher percentage of males as opposed to females will eventually convert to a psychosis in the schizophrenia spectrum.

The primary aim of the present study was to examine whether symptomatic differences could be found in ethnic minority subjects with a high risk of developing a psychotic disorder compared to Dutch subjects. Growing up as a member of an ethnic minority group may cause feelings of social defeat and/or altered ethnic identity that in turn may play a role in the development of certain symptoms. It is for this reason, in addition to the small sample sizes of the separate ethnic groups, that we first investigated the total ethnic minority group. However, some groups may be more vulnerable to certain experiences and therefore we also reported on the results of the different ethnicities separately. The results concerning specific minority groups should be interpreted with caution given the small sample size of certain minority groups.

We recognize that the fact that reviewers were not blind for ethnicity may have accounted for some of the reported differences within our study cohort. At the same time, we do not believe that this has affected our results substantially. To avoid cross-cultural bias, ethnic and cultural background was taken into account when measuring symptoms (Zandi *et al.* 2010). We asked about the self-experienced change instead of merely asking about the current complaints. In addition, within most centres we also consulted parents about any unusual changes they had observed in their child over the past year and asked whether they thought the complaints might be culture specific. Finally, the culture bias seems to involve hallucinations and dissociative symptoms in particular (Blom *et al.* 2010; Zandi *et al.* 2010), symptoms in which we did not find any differences.

It may be possible that a different manner of presenting complaints could have biased our results. Both social anxiety and depression symptoms were self-reported in our study. Emphasizing, as opposed to minimizing, complaints may just be a different way of asking for help. This latter argument is less likely to hold for the Moroccan-Dutch subgroup, where depression symptoms were not only self-reported but also proved to be significantly more severe compared

to the native Dutch group when assessed by means of a clinical assessment.

The exclusion of some young people with insufficient competence of the Dutch language may also have biased the data of our ethnic minority sample.

Finally, the ICSEY to which we compared our baseline ethnic identity measures did not include a Moroccan group, which was in fact the largest ethnic group of our ARMS cohort. The ICSEY cohort was also somewhat younger. To date, no known study has been conducted on ethnic identity among Moroccan young immigrants, and this merits attention in the future.

## Conclusions

Irrespective of the underlying mechanisms, the prevalence of more negative symptoms and depression symptoms in certain ethnic minority groups deserves attention, because attenuated positive symptoms when accompanied by negative symptoms or distress have proven to be predictive for a first psychotic episode (e.g. Yung *et al.* 2006; Cannon *et al.* 2008; Velthorst *et al.* 2009). Feelings of shame and stigma relating to ethnic identity may be important targets in future ultra-high-risk (UHR) studies. In addition, although the correlation between reduced negative symptoms and increased group identity in the Moroccan-Dutch group is tentative, it is in line with earlier findings in The Netherlands (Veling *et al.* 2010) and requires verification in larger samples.

After completing the follow-up of our trial we should be able to evaluate whether the young members of the ethnic minority group with the weakest ethnic group identity and the highest baseline negative symptom scores will eventually be the ones who go on to develop a first psychotic episode.

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## Declaration of interest

None.

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