

# Mental health difficulties and suicidal behaviours among young migrants: multicentre study of European adolescents

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## Background

Migration has been reported to be associated with higher prevalence of mental disorders and suicidal behaviour.

## Aims

To examine the prevalence of emotional and behavioural difficulties, suicidal ideation and suicide attempts among migrant adolescents and their non-migrant peers.

## Method

A school-based survey was completed by 11 057 European adolescents as part of the Saving and Empowering Young Lives in Europe (SEYLE) study.

## Results

A previous suicide attempt was reported by 386 (3.6%) adolescents. Compared with non-migrants, first-generation migrants had an elevated prevalence of suicide attempts

(odds ratio (OR) 2.08; 95% CI 1.32–3.26;  $P=0.001$  for European migrants and OR 1.86; 95% CI 1.06–3.27;  $P=0.031$  for non-European migrants) and significantly higher levels of peer difficulties. Highest levels of conduct and hyperactivity problems were found among migrants of non-European origin.

## Conclusions

Appropriate mental health services and school-based supports are required to meet the complex needs of migrant adolescents.

## Declaration of interest

None.

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Migration has become an increasingly important phenomenon in European societies, with 50.8 million people, or 10% of the total European Union (EU) population, born outside of their country of residence.<sup>1</sup> Although it is clear that the health of adolescents is strongly affected by social factors at personal, family, community and national levels,<sup>2</sup> findings relating to the impact of migration on mental health have been mixed and often inconclusive.<sup>3</sup> The authors of a large-scale Danish national cohort study reported associations between migration and certain psychiatric disorders, including schizophrenia, but not other disorders.<sup>4</sup> A review of the literature on migrants in Norway found an increased risk of mental illness among migrants, primarily linked to a higher risk of deprivation, experiences of discrimination and traumatic pre-migration experiences.<sup>5</sup> A UK study of young adolescents reported findings indicating greater psychological distress, including emotional symptoms and peer problems, among migrants and refugees than non-migrant adolescents.<sup>6</sup> A systematic review of the literature found evidence that a migrant background in Europe was associated with elevated risk of emotional problems but not behavioural problems.<sup>7</sup> Higher rates of suicidal behaviours have been observed in various migrant groups internationally, but the relationship between migration status and suicidal behaviours in youth appears to vary by ethnicity, country of origin and country of settlement.<sup>8,9</sup> Migrants from countries with high rates of suicide, for example, areas of Northern and Eastern Europe and South Asia, experience higher rates of completed suicide than non-migrants.<sup>9</sup> A German study found that migration background is associated with non-suicidal self-injury (NSSI) and suicide attempt in adolescents,<sup>10</sup>

and an elevated risk of suicide attempts specifically among migrants of non-European origin has also been reported.<sup>11</sup>

Suggested explanations of poorer mental health among migrant adolescents include the negative effects of ethnic minority status, the impact of the migration process and poorer socioeconomic conditions.<sup>7</sup> It is also important to note that cultural differences in prevalence rates of mental disorders exist generally worldwide, irrespective of migration experiences.<sup>12</sup>

Given the need for further cross-national research on the mental health of migrant adolescents in Europe, our objectives were:

- to examine the prevalence of emotional and behavioural difficulties, suicidal thoughts and suicide attempts among non-migrants and migrants
- to explore the effects of migrant generation (first or second generation) and region of origin (European or non-European) on mental health.

## Method

Data were drawn from the Saving and Empowering Young Lives in Europe (SEYLE) study,<sup>13</sup> a randomised controlled trial (RCT) registered with the German Clinical Trials Registry (number DRKS00000214). Participants were recruited from 168 schools in 10 EU countries (Austria, Estonia, France, Germany, Hungary, Ireland, Italy, Romania, Slovenia and Spain) in 2009/2010. The

trial evaluated school-based interventions for the prevention of suicidal behavior.<sup>14</sup> Ethical approval was obtained at each study site from the appropriate local ethics committees. Participants were included in the study only if both pupils and caregivers had given informed written consent. Full details of trial methodology, consent procedures, response rates and representativeness of the sample have been reported elsewhere.<sup>15</sup> For this cross-sectional assessment, baseline data from the SEYLE data-set were used and only adolescents for whom migrant status was recorded were included, resulting in a total sample of 11 057 participants (99.5% of the total SEYLE sample). Of these, 59% were girls and 41% were boys. The mean age of the sample was 14.8 years (s.d. = 0.8).

### Data collection

Students were administered a self-report questionnaire which included well-established instruments and several items developed for the SEYLE study.<sup>13</sup>

### Migration background

Several items in the SEYLE questionnaire assessed migration background. Participants were asked whether they were born in their country of residence, with possible responses 'Yes', 'No' and 'I don't know' ('I don't know' was coded as missing for the purposes of our analyses,  $n=5$ ). If participants responded that they were not born in their country of residence, follow-up items asked them the age at which they moved to their country of residence and whether they perceived the relocation of their family as positive or negative. Participants born abroad were also asked to name their country of birth, which was subsequently re-coded into eight geographical regions: Western Europe, Eastern Europe, Middle East (including Turkey), Africa, North America, Central and South America, Asia and Australia/New Zealand. As non-European origin has been found to be associated with mental health problems in migrant adolescents,<sup>7</sup> migrants were also categorised as having European origin or non-European origin. Non-European origin included migrants from Central or South America, Africa, the Middle East and Asia. Due to ethnic and cultural similarities, migrants from North America and Australia/New Zealand were categorised as having European origin, as well as migrants from Western and Eastern Europe.

Additional items assessed the migrant status of both parents separately, assessing whether each parent was born in the country of residence and, if not, the country of birth of each parent. Participants who were born in their country of residence but who had at least one foreign-born parent were categorised as second-generation migrants. Second-generation migrants were categorised as European or non-European based on the region of origin of their mother. Where this was missing, the region of origin of their father was used.

### Emotional and behavioural difficulties

The Strengths and Difficulties Questionnaire (SDQ) was used to assess emotional and behavioural difficulties. The SDQ is a brief measure of psychopathology which can be self-completed by children aged 11–16.<sup>16</sup> It has been validated in community samples and migrant groups in both high-income and low- and middle-income countries, and has been found to have good internal consistency, content, structural and concurrent validity in a range of ethnic groups.<sup>17</sup> The SDQ consists of 25 statements about the participant's behaviour in the past 6 months, consisting of five subscales with five items each: emotional problems, conduct problems, hyperactivity/inattention, peer problems and pro-social behaviour.<sup>18</sup> Responses are 'Not true', 'Somewhat true'

or 'Certainly true', with scores on each subscale ranging from 0 to 10, with higher scores indicating greater difficulties on the four symptom subscales (emotional, conduct, hyperactivity/inattention, peer problems) and greater strengths on the pro-social scale. A total difficulties score is calculated by summing the four symptom subscales. The total difficulties score ranging from 0 to 40, with higher scores indicating greater difficulties. The internal reliability of the SDQ has been assessed in the SEYLE sample and found to be acceptable (Cronbach alpha 0.74).<sup>15</sup>

### Suicidal ideation and suicide attempt

History of suicide attempt and recent serious suicidal ideation were assessed using items from the Paykel Suicide Scale.<sup>19</sup> Suicidal ideation was assessed using the following question: 'Have you seriously considered taking your own life in the past two weeks?' Responses of 'Rarely', 'Sometimes', 'Often', 'Very often' or 'Always' were coded as positive for serious ideation, and 'Never' was coded as negative. Suicide attempt was assessed using the following question: 'Have you ever tried to take your own life?'

### Socioeconomic status

Socioeconomic status (SES) has been reported to be associated with migrant background among adolescents in Europe<sup>3</sup> and is also associated with mental health problems in children.<sup>20</sup> Although SES was not measured using a validated instrument in this study, we have used responses to the following question as a proxy: 'Do your parents have trouble making ends meet?' with responses categorised as 'Yes' or 'No'.

### National migrant integration policies

National policies towards migrants were assessed using the Migrant Integration Policy Index (MIPEX), a tool which measures policies to integrate migrants in 38 countries including all EU member states.<sup>21</sup> A score out of 100% is allocated to each country, where 100% represents the most positive integration-promoting policies in areas such as market mobility, family reunion, access to education, political participation, access to citizenship, long-term residence and anti-discrimination laws. We report MIPEX scores for each country with a participating study centre. Scores were later categorised into a binary variable of low (less than 50%) integration promotion policies and high (50% or higher) integration promotion policies. This cut-off of 50% is used by MIPEX to differentiate broadly unfavourable from broadly favourable scores worldwide.

### Household composition

Household composition was also assessed, as living in a single parent household may be a confounding factor for associations between migration and mental health. Participants were asked with whom they live most of the week, with responses categorised as living with both parents and any other household composition.

### Statistical analyses

Non-migrants and four migrant groups (first-generation European, second-generation European, first-generation non-European, second-generation non-European) were compared in terms of mean scores on the SDQ subscales and total difficulties scale using ANOVA, with Tukey's *post hoc* group comparisons. These subgroups were also compared in terms of suicidal ideation and history of suicide attempt using chi-squared tests. Associations between SES and SDQ scores were examined using

*t*-tests and associations between SES and suicidal ideation and suicide attempt were examined using chi-squared tests.

Migrant groups were compared with non-migrants in terms of scores on SDQ scales using multilevel mixed effects linear regression, with fixed effects for age, gender, household composition, SES, MIPEX score of country and with random effects to account for clustering within schools and countries. To examine associations between migrant background and suicidal ideation and suicide attempt, multilevel mixed effects logistic regression was carried out, with adjustment for potential confounding factors (age, gender, household composition, SES and MIPEX score of country) and for clustering within schools and countries.

Where age was missing, it was replaced with the mean value of participants in the same study site/country ( $n=54$ ). Cases with missing data on the remaining variables were excluded from the relevant analysis. As there was no evidence of gender interaction effects, we did not carry out analyses separately for boys and girls. Missing data ranged from 2.6% to 4.8% on the analysed variables. Due to low levels of missing data on the covariates included in adjusted regression models, less than 4% of cases included in univariate analyses were missing from adjusted models. Analyses were carried out using SPSS version 20 (IBM) and Stata version 12 (StataCorp).

## Results

In this 10-country sample, 663 participants (6.0%) were born outside their country of residence and were therefore first-generation migrants (Table 1). There was a large variation between participating sites in the size of the migrant population. Romania and Estonia had the lowest proportions of participants born abroad (0.4 and 2.0% respectively), whereas the highest proportions of first-generation migrants were in Ireland (17.8%), Spain (14.1%) and Germany (7.4%). The mean age of arrival in the country of residence for first-generation migrants was 6.8 years. In the total sample, approximately two-thirds (66.5%) of first-generation migrants reported that the migration of their family was positive overall. The proportion reporting migration as positive was as low as a third in Estonia and as high as 80.8% in Italy. In the total sample, 12.5% of non-migrants reported that their parents had trouble making ends meet, compared with 15.5% of first-generation migrants and 14.3% of second-generation migrants ( $P=0.031$ ). There were significant differences between the proportion of migrants and non-migrants experiencing economic hardship in Austria, Germany and Ireland, with highest proportions reporting trouble making ends meet among first-generation migrants in each of these centres. In the German sample, 25% of first-generation migrants reported economic difficulties, compared with 17.2% of second-generation migrants and 11.8% of non-migrants ( $P<0.0005$ ). In Ireland, 18.6% of first-generation migrants reported economic difficulties, compared with 16.4% of second-generation migrants and 6.8% of non-migrants ( $P<0.0005$ ).

Of first-generation migrants, 236 (35.6%) were born in Western Europe and 165 (24.9%) in Eastern Europe, 141 (21.3%) in Central or South America, 46 (6.9%) in Asia, whereas smaller numbers were born in Africa, the Middle East, North America and Australia/New Zealand (Table 2). Of second-generation migrants, approximately one-third were of Western European origin and a further one-third were of Eastern European origin (32.9 and 32% respectively). There were large differences between centres in terms of region of origin of the migrant population. The majority of migrants of both generations from Central or South America were in Spain (144 out of 204 in the total sample), whereas the majority of migrants from the Middle East were in the German sample (137 out of 193). Ireland had the highest proportion of its migrants from Western Europe (58.4% of first-generation and 85.9% of second-generation migrants).

**Table 1** Sociodemographic characteristics of first- and second-generation migrants by country of residence

Country	Age, years: mean (s.d.) (range)	First-generation migrants: <i>n</i> (% of sample)	Second-generation migrants: <i>n</i> (% of sample)	Mean (s.d.) arrival age (years) of first-generation migrants	% of first-generation migrants reporting migration positive	% reporting trouble making ends meet: non-migrant	% reporting trouble making ends meet: first-generation migrant	% reporting trouble making ends meet: second-generation migrant	<i>P</i> group comparison: % with trouble making ends meet
Total ( <i>n</i> =11057)	14.8 (0.84) (12–18)	663 (6.0)	1298 (11.7)	6.8 (4.2)	66.5	12.5	15.5	14.3	0.031
Austria ( <i>n</i> =941)	15.1 (0.77) (14–16)	46 (4.9)	168 (17.9)	6.8 (3.8)	72.1	4.5	15.2	13.9	<0.0005
Estonia ( <i>n</i> =1034)	14.2 (0.51) (12–17)	21 (2.0)	79 (7.6)	4.2 (3.5)	33.3	16.5	23.8	22.8	0.26
France ( <i>n</i> =1004)	15.2 (0.76) (13–18)	33 (3.3)	106 (10.6)	5.9 (3.6)	56.5	12.1	6.2	8.6	0.36
Germany ( <i>n</i> =1442)	14.7 (0.81) (12–17)	107 (7.4)	359 (25.0)	6.0 (3.6)	63.5	11.8	25.0	17.2	<0.0005
Hungary ( <i>n</i> =1009)	15.1 (0.79) (13–18)	28 (2.8)	74 (7.3)	4.0 (3.3)	55.0	16.7	12.0	12.3	0.52
Ireland ( <i>n</i> =1104)	13.7 (0.68) (13–16)	197 (17.8)	156 (14.1)	6.3 (4.1)	69.2	6.8	18.6	16.4	<0.0005
Italy ( <i>n</i> =1190)	15.3 (0.66) (14–18)	38 (3.2)	106 (8.9)	7.8 (4.8)	80.8	6.7	8.8	11.0	0.26
Romania ( <i>n</i> =1141)	15.0 (0.37) (14–17)	5 (0.4)	6 (0.5)	7.6 (6.5)	66.7	27.2	20.0	0.0	0.44
Slovenia ( <i>n</i> =1164)	15.2 (0.72) (14–18)	43 (3.7)	178 (15.3)	6.5 (4.5)	65.8	10.8	11.9	12.1	0.88
Spain ( <i>n</i> =1028)	14.5 (0.70) (13–17)	145 (14.1)	68 (6.6)	8.7 (3.9)	67.5	5.5	8.7	9.1	0.20

**Table 2** Country of origin of first- and second-generation migrants in 10 European Union countries

Country	Migrant generation	Western Europe, n (%)	Eastern Europe, n (%)	Central or South America, n (%)	Asia, n (%)	North America, n (%)	Middle East, n (%)	Africa, n (%)	Australia/New Zealand, n (%)	Not stated, n (%)
Total	First	236 (35.6)	165 (24.9)	141 (21.3)	46 (6.9)	24 (3.6)	22 (3.3)	21 (3.2)	3 (0.5)	5 (0.8)
	Second	427 (32.9)	416 (32.0)	63 (4.9)	55 (4.2)	37 (2.9)	171 (12.2)	66 (5.1)	7 (0.5)	56 (4.3)
Austria	First	34 (73.9)	5 (10.9)	1 (2.2)	0 (0)	1 (2.2)	4 (8.7)	1 (2.2)	0 (0)	0 (0)
	Second	64 (38.1)	56 (33.3)	6 (3.6)	0 (0)	3 (1.8)	25 (14.9)	5 (3.0)	0 (0)	7 (4.2)
Estonia	First	13 (61.9)	4 (19.0)	0 (0)	0 (0)	1 (4.8)	2 (9.5)	0 (0)	0 (0)	1 (4.8)
	Second	7 (8.9)	57 (72.2)	1 (1.3)	5 (6.3)	0 (0)	4 (5.1)	1 (1.3)	0 (0)	4 (5.1)
France	First	20 (60.6)	3 (9.1)	3 (9.1)	3 (9.1)	0 (0)	0 (0)	4 (12.1)	0 (0)	0 (0)
	Second	46 (43.4)	3 (2.8)	4 (3.8)	4 (3.8)	2 (1.9)	9 (8.5)	34 (32.2)	0 (0)	4 (3.8)
Germany	First	8 (7.5)	39 (36.4)	6 (5.6)	33 (30.8)	6 (5.6)	12 (11.2)	2 (1.9)	0 (0)	1 (0.9)
	Second	48 (13.4)	108 (30.1)	6 (1.7)	34 (9.5)	12 (3.3)	125 (34.8)	14 (3.9)	0 (0)	12 (3.3)
Hungary	First	14 (50.0)	8 (28.6)	1 (3.6)	2 (7.1)	2 (7.1)	1 (3.6)	0 (0)	0 (0)	0 (0)
	Second	9 (12.2)	48 (64.9)	1 (1.3)	6 (8.1)	2 (2.7)	2 (2.7)	2 (2.7)	0 (0)	4 (5.4)
Ireland	First	115 (58.4)	43 (21.8)	5 (2.5)	4 (2.0)	14 (7.1)	1 (0.5)	10 (5.1)	3 (1.5)	2 (1.0)
	Second	134 (85.9)	0 (0)	0 (0)	1 (0.6)	7 (4.5)	2 (1.3)	2 (1.3)	0 (0)	10 (6.4)
Italy	First	11 (28.9)	19 (50.0)	5 (13.2)	1 (2.6)	0 (0)	0 (0)	2 (5.3)	0 (0)	0 (0)
	Second	61 (57.6)	3 (2.8)	21 (19.8)	0 (0)	9 (8.5)	0 (0)	3 (2.8)	5 (4.7)	4 (3.8)
Romania	First	1 (20.0)	4 (80.0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
	Second	2 (33.3)	0 (0)	0 (0)	0 (0)	0 (0)	3 (50)	0 (0)	0 (0)	1 (16.7)
Slovenia	First	10 (23.3)	31 (72.1)	0 (0)	0 (0)	0 (0)	2 (4.7)	0 (0)	0 (0)	0 (0)
	Second	20 (11.2)	142 (79.8)	0 (0)	0 (0)	1 (0.6)	0 (0)	3 (1.7)	2 (1.1)	10 (5.6)
Spain	First	10 (6.9)	9 (6.2)	120 (82.8)	3 (2.1)	0 (0)	0 (0)	2 (1.4)	0 (0)	1 (0.07)
	Second	36 (54.6)	1 (1.5)	24 (36.4)	1 (1.5)	1 (1.5)	1 (1.5)	2 (3.0)	0 (0)	0 (0)

Non-migrants had the lowest mean SDQ total difficulties scores (10.39; 95% CI 10.28–10.49), as well as lowest scores on each of the four SDQ symptom scales: emotional, conduct, hyperactivity and peer problems (Table 3). First-generation non-European migrants had the highest total difficulties scores (12.69; 95% CI 12.05–13.33) and also had highest levels of difficulties on three of the four symptom SDQ scales, with second-generation non-European migrants having highest scores on the conduct scale.

The only significant differences between the subgroups in terms of SDQ scores were for peer problems, with first-generation European and first-generation non-European migrants both having higher scores than non-migrants (Tukey *post hoc* comparisons,  $P=0.047$  and  $P=0.035$  respectively). There were no other significant between-group differences on any of the subscales or the total difficulties scale.

Of the total sample, 386 (3.6%) reported having attempted suicide at some time in their lives and 404 (3.7%) reported serious suicidal ideation in the previous 2 weeks. There were significant differences between migrant groups in terms of prevalence of suicide attempt ( $P<0.0005$ ). A history of suicide attempt was reported by 3.1% of both non-migrants and of second-generation European migrants, 6.9% of first-generation European migrants and 9.0 and 7.1% of first- and second-generation non-European migrants respectively. Migrants and non-migrants also differed significantly in terms of history of serious suicidal ideation ( $P<0.0005$ ). Highest prevalence of suicidal ideation was among second-generation non-European migrants (9.6%), and lowest prevalence was among non-migrants (3.2%).

Self-reported difficulty making ends meet was associated with higher total scores on the SDQ and also higher scores on

all of the SDQ difficulties subscales ( $P<0.0005$  on emotional, peer problems, hyperactivity/inattention and conduct scales). There were no significant differences between those reporting difficulties making ends meet and those without this experience in terms of scores on the SDQ pro-social scale.

Based on adjusted multilevel mixed effects regression models, two of the migrant groups had significantly higher scores on the SDQ total difficulties scale than the non-migrant reference group: first-generation non-European migrants (coefficient 1.34; CI 0.67–2.01;  $P<0.0005$ ) and second-generation non-European migrants (coefficient 0.88; CI 0.35–1.40;  $P<0.0005$ ), while neither group of European migrants differed significantly from the reference group (Table 4).

There were no significant differences between the groups in terms of the emotional difficulties subscale, whereas both first- and second-generation non-European migrant groups had higher scores than the reference group on the hyperactivity/inattention subscale (coefficient 0.33; 95% CI 0.03–0.62;  $P=0.03$  and coefficient 0.28; 95% CI 0.05–0.51;  $P=0.02$  respectively) and the conduct subscale (coefficient 0.22; 95% CI 0.002–0.43;  $P=0.04$  and coefficient 0.33; 95% CI 0.16–0.49;  $P<0.0005$  respectively).

In terms of peer problems, both first-generation migrant groups had significantly higher scores than the non-migrant group, with a coefficient of 0.22 (95% CI 0.07–0.38;  $P=0.01$ ) for first-generation European migrants and a coefficient of 0.70 (95% CI 0.48–0.91;  $P<0.0005$ ) for first-generation non-European migrants, compared with non-migrants.

Second-generation non-European migrants were more than twice as likely to report recent suicidal ideation (odds ratio (OR) 2.16; 95% CI 1.44–3.25;  $P<0.0005$ ) than non-migrants (Table 5). First-generation European migrants were the only other group to have a significantly different prevalence of suicidal ideation than

**Table 3** Emotional and behavioural difficulties, suicidal ideation and suicide attempt by migration background<sup>a</sup>

	Non-migrants (n=9018)	First-generation migrants (European origin) (n=428)	Second-generation migrants (European origin) (n=887)	First-generation migrants (non- European origin) (n=230)	Second-generation migrants (non- European origin) (n=355)	P: overall group differences
SDQ Total Difficulties Score, mean (95% CI)	10.39 (10.28–10.49)	10.76 (10.30–11.28)	10.63 (10.30–10.98)	12.69 (12.05–13.33)	11.90 (11.37–12.46)	<0.0005
SDQ Emotional Score, mean (95% CI)	2.8 (2.75–2.85)	2.83 (2.60–3.06)	2.90 (2.77–3.04)	3.31 (3.02–3.62)	3.15 (2.91–3.38)	<0.0005
SDQ Hyperactivity/ inattention Score, mean (95% CI)	3.58 (3.54–3.62)	3.73 (3.51–3.94)	3.58 (3.45–3.73)	4.34 (4.03–4.62)	3.97 (3.73–4.24)	<0.0005
SDQ Conduct Score, mean (95% CI)	2.3 (2.27–2.33)	2.39 (2.23–2.55)	2.38 (2.28–2.49)	2.52 (2.33–2.72)	2.74 (2.54–2.93)	<0.0005
SDQ Peer Problems Score, mean (95% CI)	1.71 (1.67–1.74)	1.80 (1.66–1.98)	1.77 (1.67–1.87)	2.53 (2.30–2.75)	2.04 (1.88–2.21)	<0.0005
SDQ Pro-social Score, mean (95% CI)	7.46 (7.42–7.50)	7.48 (7.29–7.76)	7.63 (7.51–7.74)	7.38 (7.13–7.63)	7.69 (7.49–7.90)	0.013
Serious suicidal ideation, n (%)	289 (3.2)	24 (5.7)	30 (3.4)	15 (6.7)	34 (9.6)	<0.0005
Suicide attempt (lifetime history) n (%)	276 (3.1)	29 (6.9)	27 (3.1)	20 (9.0)	25 (7.1)	<0.0005

SDQ, Strengths and Difficulties Questionnaire.  
a. Confidence intervals based on bootstrapping (1000 samples).  
Tukey's *post hoc* comparisons: the only significant differences between the subgroups in terms of SDQ scores were for peer problems, with first-generation European and first-generation non-European migrants differing from non-migrants (Tukey's *post hoc* comparisons,  $P=0.047$  and  $P=0.035$  respectively).  
No significant differences between migrant groups.

non-migrants (OR = 1.72; 95% CI 1.09–2.70;  $P=0.02$ ). First-generation European migrants were twice as likely to report a history of suicide attempt as their non-migrant peers (OR = 2.08; 95% CI 1.32–3.26;  $P=0.001$ ), whereas first-generation non-European migrants also had higher prevalence than non-migrants (OR = 1.86; 95% CI 1.06–3.27;  $P=0.031$ ).

## Discussion

In our 10-country adolescent sample, 6% of participants were first-generation migrants and a further 11.7% were second-generation migrants. Over half of the migrants had moved from another European country, with smaller numbers coming from Central or South America, Asia, Africa and other regions. After adjustment for a range of confounding factors, first-generation migrants were found to have significantly higher prevalence of suicide attempts than their non-migrant peers, with first-generation European migrants having double the prevalence of suicide attempt of non-migrants. First-generation migrants of both European and non-European origin also had significantly higher levels of peer problems. We found elevated levels of total difficulties, hyperactivity/inattention and conduct problems in non-European migrants, both first and second generation. Highest prevalence of suicidal ideation was among second-generation non-European migrants. We found no significant differences between migrants and non-migrants in terms of emotional symptoms.

Our findings of elevated risk of mental health difficulties among migrants, in particular in the first generation, are similar to findings of a recent large Danish cohort study.<sup>4</sup> However, we found that migrants and non-migrants had similar levels of emotional difficulties, which is at odds with the findings of a systematic review of European studies which reported elevated rates of emotional difficulties among migrants.<sup>7</sup>

We did not find evidence supporting the so-called immigrant paradox, the counterintuitive finding that immigrants often tend to

show better adaptation outcomes than their non-migrant peers, in spite of poorer SES, whereas second-generation migrants regress to the level of non-migrants in terms of adaptation.<sup>22</sup> Our findings differ from another recent European study which did report evidence of more positive mental health among migrants.<sup>23</sup> In this study, Mood and colleagues examined internalising and externalising difficulties among young people of migrant background (first or second generation) in the UK, Germany, The Netherlands and Sweden and found that, despite potential problems with acculturation and social stress, migrant adolescents reported fewer internalising and externalising problems than the majority population. The authors note differing prevalence of mental health difficulties among migrants in each of the European destination countries studied, which points to the importance of country-specific integration policies and the prevailing attitudes towards migrants.

First-generation migrants of both European and non-European origin were found to have elevated risk of suicide attempts in our study, compared with the non-migrant reference group. This finding provides some support for the risk perspective on migration, which focuses on the stresses of the migration process to explain higher rates of depressive and other mental disorders among migrants.<sup>24</sup> It is worth noting that in our overall sample and in many of the individual centres, first-generation migrants were the most likely to report economic hardship. These differences were statistically significant in the centres with the largest migrant populations (Germany and Ireland) and support the view that socioeconomic hardship contributes to adversity among migrant groups. We also found strong associations between economic hardship and mental health difficulties, although our findings of associations between migration and mental health measures and suicidality remained after adjustment for SES. Our findings that second-generation non-European migrants experienced elevated levels of behavioural difficulties as well as higher rates of suicidal ideation support the suggestion that post-migration factors may be more important risk mediators than the migration experience.<sup>25</sup>

**Table 4** Strengths and Difficulties Questionnaire (SDQ) scores by migration background

	SDQ Total Difficulties Score		SDQ Emotional Score		SDQ Hyperactivity/Inattention Score		SDQ Conduct Score		SDQ Peer Problems Score		SDQ Pro-social Score	
	Coefficient (95% CI)	P	Coefficient (95% CI)	P	Coefficient (95% CI)	P	Coefficient (95% CI)	P	Coefficient (95% CI)	P	Coefficient (95% CI)	P
Estimated mean value of reference group (non-migrants)	8.34 (7.75–8.94)	<0.0005	1.49 (1.25–1.73)	<0.0005	3.18 (2.92–3.43)	<0.0005	2.13 (1.91–2.35)	<0.0005	1.54 (1.26–1.82)	<0.0005	6.89 (6.54–7.24)	<0.0005
First-generation migrants (European origin)	0.41 (–0.09–0.90)	0.11	0.08 (–0.14–0.29)	0.48	0.01 (–0.20–0.23)	0.91	0.09 (–0.07–0.25)	0.27	0.22 (0.07–0.38)	0.01	–0.02 (–0.19–0.16)	0.87
Second-generation migrants (European origin)	0.08 (–0.27–0.42)	0.67	0.02 (–0.13–0.17)	0.79	–0.06 (–0.21–0.09)	0.45	0.08 (–0.32–0.19)	0.17	0.02 (–0.08–0.13)	0.66	0.12 (0.001–0.25)	0.04
First-generation migrants (non-European origin)	1.34 (0.67–2.01)	<0.0005	0.08 (–0.21–0.37)	0.59	0.33 (0.03–0.62)	0.03	0.22 (0.002–0.43)	0.04	0.70 (0.48–0.91)	<0.0005	–0.41 (–0.65–0.16)	0.001
Second-generation migrants (non-European origin)	0.88 (0.35–1.40)	<0.0005	0.13 (–0.10–0.35)	0.27	0.28 (0.05–0.51)	0.02	0.33 (0.16–0.49)	<0.0005	0.13 (–0.04–0.29)	0.13	0.14 (–0.05–0.33)	0.15

Note: Multilevel mixed effects linear regression coefficients and their 95% confidence intervals adjusted for the fixed effects of age, gender, socioeconomic status, household composition and MIPEX integration score, and for clustering of pupils within schools and within countries.

**Table 5** Suicidal ideation and suicide attempt by migration background<sup>a</sup>

	Serious suicidal ideation		Suicide attempt	
	Odds ratio (95% CI)	<i>P</i>	Odds ratio (95% CI)	<i>P</i>
First-generation migrants (European origin)	1.72 (1.09–2.70)	0.02	2.08 (1.32–3.26)	0.001
Second-generation migrants (European origin)	0.95 (0.64–1.41)	0.805	0.88 (0.58–1.35)	0.554
First-generation migrants (non-European origin)	1.28 (0.70–2.36)	0.424	1.86 (1.06–3.27)	0.031
Second-generation migrants (non-European origin)	2.16 (1.44–3.25)	<0.0005	1.56 (0.99–2.47)	0.058

a. Reference group: non-migrants.  
 Note: Multilevel mixed effects logistic regression coefficients and their 95% confidence intervals adjusted for the fixed effects of age, gender, socioeconomic status, household composition and MIPEX integration score, and for clustering of pupils within schools and within countries.

When examining conduct and hyperactivity problems, we found that non-European migrants, regardless of migrant generation, had higher symptom levels than non-migrants. This may be due to difficulties with acculturation among non-European migrants, trauma experienced prior to or during migration, experiences of discrimination or alienation or socioeconomic reasons. Experiences of racial discrimination were not assessed in this study, but such experiences may be one of the pathways through which migration is associated with poor mental health and suicidality among non-European migrants, as perceived discrimination has been reported to be associated with health outcomes in first-generation migrants in some countries.<sup>26</sup>

Despite comparable levels of emotional and behavioural symptoms, first-generation European migrants had a significantly higher prevalence of both suicidal ideation and suicide attempts than their non-migrant peers. Although a previous European multicentre study found that non-European origin was associated with suicide attempt,<sup>27</sup> after controlling for SES and other factors, both European and non-European migrant groups were at elevated risk of suicide attempts in our study. A previous German study reported that both first- and second-generation migrants had higher rates of suicide attempt than non-migrants,<sup>10</sup> whereas Webb and colleagues reported higher incidence of suicide attempt among first- and second-generation migrants than non-migrant Danes,<sup>4</sup> with the highest incidence among first-generation migrants.

We have not distinguished between adolescents who migrated during childhood and the small number of participants who migrated in early adolescence. As high risk has been reported to be associated with migration during adolescence,<sup>28</sup> there may be a subgroup with poorer mental health who migrated more recently. Given the large number of countries of origin of migrant participants, we were unable to examine whether cultural differences in prevalence of mental disorders and suicidal behaviours may explain some of the variations in prevalence between migrant and non-migrant groups in our sample. It has been suggested that migrants bring with them an 'imported risk' of suicide from their country of origin, at least for the initial period in the receiving country.<sup>9</sup>

### Strengths and limitations

The data we report were gathered before the recent increase in the numbers of young refugees arriving in Europe, particularly from the Middle East, and therefore the migrant population in our sample may not reflect the current population in terms of the region of origin, reasons for migration or pre-migration

trauma. Another limitation may be the use of a self-report instrument to assess both migrant background and mental health. Although data on migration were rigorously recorded, the study was not designed to assess integration among migrant adolescents. Some SEYLE questionnaire items have not been validated, for example, the item used to assess SES. Furthermore, there may be a risk of bias associated with the use of a school-based survey methodology, particularly due to the exclusion of non-attending students who may be a group with high levels of difficulties. Consent procedures may also have led to non-participation by some adolescents. Analyses examining suicidal ideation and attempt among non-European migrants may have been limited by the relatively small size of the non-European migrant subgroups and by the range of culturally diverse countries of origin included in these subgroups.

However, the strengths of this study include the large and representative sample of adolescents from 10 European countries and the use of multilevel mixed effects regression models which account for the clustered nature of the data.<sup>29</sup> We have used a multiple-origin, multiple-generation approach to our examination of associations between migration and mental health; further analyses could also include a multiple-destination element to compare effects of migration across different destination countries.

As the proportion of children and adolescents with a migrant background continues to rise in Europe, professional groups have emphasised the urgent need for both additional research on migrant mental health and a greater focus on the provision of appropriate services.<sup>30</sup> Evidence-based universal school-based mental health promotion programmes that have been shown to be effective in preventing suicidal thoughts and behaviours should be implemented in all schools.<sup>13</sup> Suicide prevention programmes may need to be adapted for or specifically target first-generation migrant adolescents, whose elevated risk of suicide attempt persists across different regions of origin and after controlling for SES and other factors. Migrant adolescents may experience barriers to accessing mental healthcare, including language barriers, differing beliefs about mental illness, stigma and social deprivation.<sup>31</sup> These barriers can potentially be overcome through strategies such as training of mental health services staff on cross-cultural issues, integration of mental healthcare with primary care, educational initiatives focused on families and social groups and technology-based interventions.<sup>31,32</sup> Such initiatives within schools and health services may contribute to reducing the high rates of mental ill health and suicidality among young migrants in Europe.

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