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Mental health risk factors for native and non-native children in Lithuania

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ABSTRACT

Background

According to the last Soviet census in 1989, 9.4 percent of Lithuania's population was ethnic Russian which is one of the main non Lithuanian origins of people living in Lithuania. We propose to explore the effect of belonging to a minority on children mental health by comparing children of native and non native Lithuanian parents.

Methods

Data for this study were obtained from the School Child Mental Health Europe survey, a cross-sectional survey of school children aged 6-11 years. A total of 958 Lithuanian children with eligible criteria participated, among them 11.59% from a non native Lithuanian family. We use the Dominique Interactive administered to children and the Strength and Difficulties Questionnaires for parents and teachers to assess mental health problems in children. The information from three informants was combined to define children mental health care needs. Logistic regression models were used to determine to which extent the predictor variables associated with mental disorders in children.

Results

25.5% of non native versus 16.6% of native Lithuanian children reported having internalized disorders when they are the informants ($p=0.022$). There is no difference between two groups for any disorders according to parent or teacher report or for combined measurement. Children of non native Lithuanian parents have higher risk of having internalized disorders than native children with unadjusted odd-ratio (OR) of 1.74 (1.09-2.76) and adjusted OR of 1.87 (1.14-2.76). In addition, other risk factors for internalized disorders in children are being a girl, low caring behavior and current smoking status of mother after taking into account other variables in the multivariate analysis.

Conclusion

Being from a minority origin is a risk factor for children in Lithuania. Since these concerns internalized disorders only and is not detected by parents or teachers, this may be a topic of further in depth studies.

RÉSUMÉ

Contexte: D'après le recensement Soviétique de 1989, 9,4% des habitants de Lituanie appartenaient à l'ethnie Russe, qui est l'une des origines étrangères la plus représentée parmi les habitants. On envisage ici d'étudier les effets de l'appartenance à une minorité sur la santé mentale des enfants en Lituanie, en comparant les enfants de parents Litvaniens à ceux de parents étrangers.

Méthodes: Les données de cette étude sont issues d'un sondage de The School Child Mental Health Europe (SCMHE) réalisé auprès d'élèves âgés de 6 à 11 ans. Au total 958 enfants Litvaniens répondant aux critères d'éligibilités ont participé, parmi lesquels 11,59% sont originaires d'une famille non-Litvanienne. Afin d'évaluer les problèmes mentaux chez les enfants, on les soumet au Domique Interactive (DI) et leur parents et professeurs au Strength and Difficulties Questionnaires. Les informations issues de ces trois sources sont combinées pour déterminer les soins et méthodes de prévention à apporter aux enfants atteints de problèmes psychologiques. Un modèle de régression logistique est utilisé pour savoir dans quelle mesure les variables déterminantes sont à associer à des troubles mentaux.

Résultats: 25,5% des enfants d'origine étrangère, contre 16,6% des Litvaniens, ont reporté avoir des troubles internalisés selon eux ($p = 0,022$). Il n'y a pas de différence de troubles entre les deux groupes d'après les résultats obtenus chez les parents et professeurs. Les enfants de parents non Litvaniens ont un risque plus grand de troubles internalisés que les enfants de Litvaniens, avec un ratio OR avant et après rajustement de 1,74 (1,09 – 2,76) et 1,87 (1,14 – 2,76) respectivement. De plus, en considérant d'autres variables dans cette analyse multidimensionnelle, on peut citer d'autres facteurs de risque générant des troubles internalisés chez enfants : le fait d'être une fille, le manque d'attention des parents, ou encore une mère fumeuse.

Conclusion: Être d'une origine minoritaire est un facteur de risques psychologiques internalisés pour les enfants de Lituanie. D'autant que cela n'est pas perçu par les parents ou professeurs. Ce point pourrait être étudié pour approfondir le sujet.

ABBREVIATIONS

AUDIT	Alcohol Use Disorders Identification Test
DI	Domique Questionnaires
DSM-IV TR	Diagnostic and Statistical Manual of Mental Disorders IV
ICC	Intraclass correlation coefficient
IQOLA	International Quality Of Life Assessment
OR	Odd Ratio
SCMHE	School Child Mental Health Europe survey
SD	Standard Deviation
SDQ	Strength and Difficulty Questionnaire
USSR	Union of Soviet Socialist Republics
WHO	World Health Organization

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1. BACKGROUND

1.1 Mental health of immigrant children

Mental health of immigrant children has received the increased interest of researchers. However, there are conflicting results of different studies regarding whether immigrant children are at greater risk for mental health disorders or not compared with children of hosting country. Many studies suggested that migrant children are at increased risk of mental health problems (broadly defined as both internalizing and externalizing disorders and psychiatric disorders) [1]. They suffer from some mental health disorders such as anxiety disorders, depression, and posttraumatic stress disorders. Such disorders can impair functioning for these children, such as academic functioning [2,3]. To explain for higher risk of mental health in immigrant children, several reasons have been used: the process of migration, the ethnic minority position of migrants, their specific cultural background and the selection of migrants [4].

In contrast, there are arguments that immigrant children are better off in terms of psychological functioning than children of receiving country [5,6]. The family's well-being and ability to support its members and to adapt to the new conditions of life is one of the protective factors for immigrant children [5,7]. In addition, the 'healthy migrant' effect that the strict health requirements migrants undergo before arriving at the host country results in a 'selection' of the fittest, and in migrants having better physical and mental health than the host population [8].

The level of mental health problems also depends on the specific selection of migrants by the receiving countries. For example, European countries such as France, Germany, Sweden and the Netherlands are considered countries that selecting mainly unskilled labor migrants while in Australia, Canada and New Zealand highly skilled migrants are mainly selected. It explained why Australian and Canadian studies did not find increased levels of self- and parent-reported problem behavior in migrant youth [4].

However, most of the literatures mainly refer to the children of refugees or economic migrants. To our knowledge, mental health of children whose parents were sent to another country for political reasons has not been studied.

1.2 Russians in Lithuania – an example

A good example for the scenario is Lithuania, a country situated on the eastern shore of the Baltic Sea, which was a part of the former Soviet Union for 50 years until 1990 when Lithuania regained its independence. Old Believer refugees from the Russian Empire were the first Russians came to Lithuania as early as 18th century. Another wave of Russians came when Lithuania itself was integrated into Russian Empire and the czar attempted a policy of Russification. Entire Russian villages supplanted Lithuanian ones in this period of the 19th century while the Russian government workers and soldiers settled in the cities. Under the Soviet occupation, a major state-sponsored resettlement campaign was carried out in the three Baltic Soviet countries including Lithuania, Latvia and Estonia. The Russians were mostly factory workers who settled in major urban areas, as well as military personnel stationed in the region in significant numbers due to the border location of the Baltic States within the Soviet Union. Every new factory had many Russian workers and (especially) executives. According to the last Soviet census in 1989 about 9.4% of the Lithuanian population was ethnic Russians [9]. Russians who reside in Lithuania live mainly in urban areas. After 1990 independence the Lithuanian government (unlike those of Latvia and Estonia) offered citizenship to every person who lived in Lithuania by the time of the dissolution of USSR – regardless of ethnicity, languages spoken or family history.

Based on the historical context, our hypothesis is that the majority of non-native children in Lithuania may come from a family which at least one of parents has ethnic Russian. However, this specific situation: being a child of parents coming from the former Soviet Union that Lithuania is used to be under its control may not have been studied as a risk factor for mental health for children.

1.3 Other risk factors for mental health in children

Along with the origin status of the child which is our main interested risk factor, other potential risk factors regarding child characteristics and mother characteristics for mental health problems in children in Lithuania also have been studied. In terms of child characteristics, age and gender indeed are important factors known to be associated with risk for psychiatric disorders during childhood and adolescence [10,11]. Numerous studies have suggested that boys are more likely to present behavioral and externalizing disorders while girls have emotional problems [12-20].

Since most of respondents are mothers, we decided to use only the information from mothers. In terms of mother characteristics, four subgroups were classified including socioeconomic characteristics of mother, the maternal attitudes and behaviors towards the child, the mental health of the mother and the maternal current consumption of tobacco and alcohol problems.

Several studies have suggested that socioeconomic disadvantage is a risk factor for child mental health problems [21,22]. A number of literature have shown that divorce or lone parenthood has been linked with externalizing behaviors, such as disobedience, aggression, low self-control, other conduct problems [23,24,25]. Therefore, we decided to include age of mother, marital status of mother, and education and occupation level of mother in the socioeconomic characteristics of mother.

In terms of maternal attitudes and behaviors, Johnson (2001) in his study suggested that negative parenting attitudes may have an impact on children's mental health [26]. Moreover, harsh parenting was seen more in immigrant parents. Children with mental health disorders were more likely to be frequently punished than those with no mental disorders. For example, Meltzer (2003) used the parents' questionnaire and found that children with mental health were more frequently shouted at (42%), sent to their room (18%) and grounded (17%) than children without mental health problems [15]. In order to measure the parenting attitudes, five components were used in our study such as laxness, verbosity, over-reactivity, caring and autonomy.

Regarding mental health of mother, some studies has found that psychiatric disorders in children are strongly associated with parents mental health [27,28,29]. Three dimensions were taken into accounts including psychological distress, role emotional and vitality.

It has also established that children of parents with alcohol problems are at greater risk for emotional and behavioral problems [30,31,32]. Maternal smoking during pregnancy is a predictor of internalizing as well as externalizing psychopathology in offspring [33,34]. The last subgroup of mother characteristics will refer to mother's consumption of tobacco and alcohol problems.

1.4 Objectives of the study

The aims of this study are (1) to explore the effect of being non-native children on their mental health by comparing children of native and non-native Lithuanian parents controlling for other potential risk factors and (2) to investigate other risk factors that are independently associated with children's mental health in Lithuania.

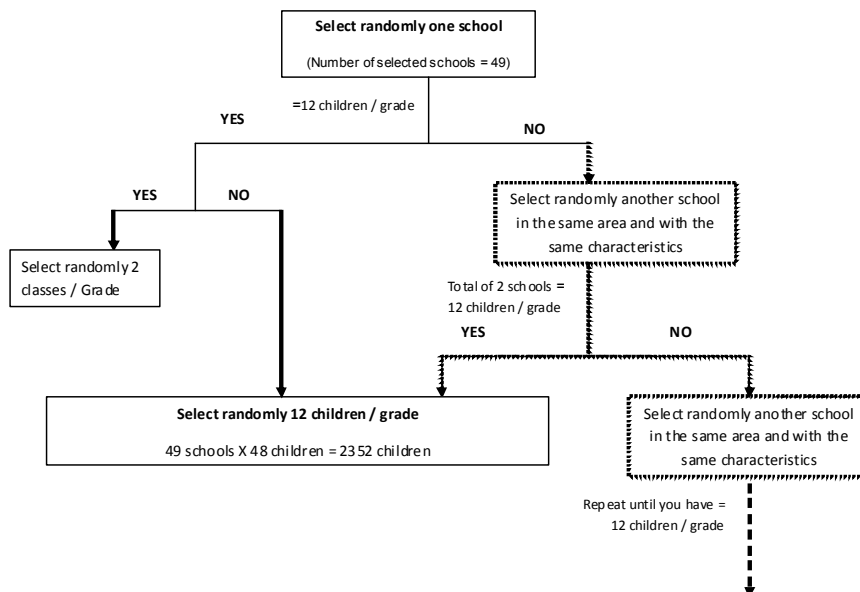
2. METHODS

2.1 Data resources

Data for this study were obtained from the School Child Mental Health Europe survey 2010 (SCMHE), a cross-sectional survey of school children aged 6-11 years in seven European countries: Germany, the Netherlands, Italy, Lithuania, Romania, Bulgaria and Turkey. The aim of the SCMHE project was to build up a set of indicators in order to collect children's mental health and its major risk factors in an efficient and comparable way in the European countries.

Primary schools were randomly selected in each participating country, classes were randomly selected in each school and 5 to 6 children were randomly selected in each class. In general, 48 children were randomly selected in each school, from 10 for primary schools with 5 grades to 12 for primary schools with 4 grades. A total of 45 to 49 schools were needed to obtain about 2500 possible interviews.

Figure 1. Sampling procedure for school with 4 grades (Source: SCMHE)



2.2 Study population

Data for children’s mental health in Lithuania were extracted from the large database of SCMHE project. Non-native Lithuanian children were defined as children whose at least one of the parents does not have ethnic Lithuanian. A total of 958 Lithuanian children with eligible criteria were included, among them 11.59% from a non-native Lithuanian family.

2.3 Measurements of children’s mental disorders

To assess the mental health of children, we collected information from three informants: children, parent and teacher.

Children’s questionnaire:

The Dominic Interactive (DI) was selected since it is available to children aged 6 to 11 years old to assess their mental health problems. DI is a comprehensive and pictorial self-report questionnaire and can help to screen four internalizing disorders (simple phobia, separation anxiety disorder, over anxious disorder, major depressive disorder) and three externalizing disorders (oppositional defiant disorder, conduct disorder, attention deficit/hyperactivity disorder) based on DSM-IV-TR [35,36]. The internal consistency (Cronbach alpha coefficients) was studied in various samples ranging from 0.62 to 0.92, and the Test-retest reliability yielded ICCs ranging from 0.59 to 0.80 according to the scale under scrutiny. Criterion validity was also assessed by asking children to explain their yes/no answers. For every drawing, the children’s explanations were recorded and later blindly analyzed by three independent clinical judges as to their correspondence with the DSM-IV

criteria. Kappa values were high (0.64-0.88) between Dominic-based diagnoses and the DSM-IV diagnoses based on judges' clinical judgments, as well as between the judges (0.76-0.95).

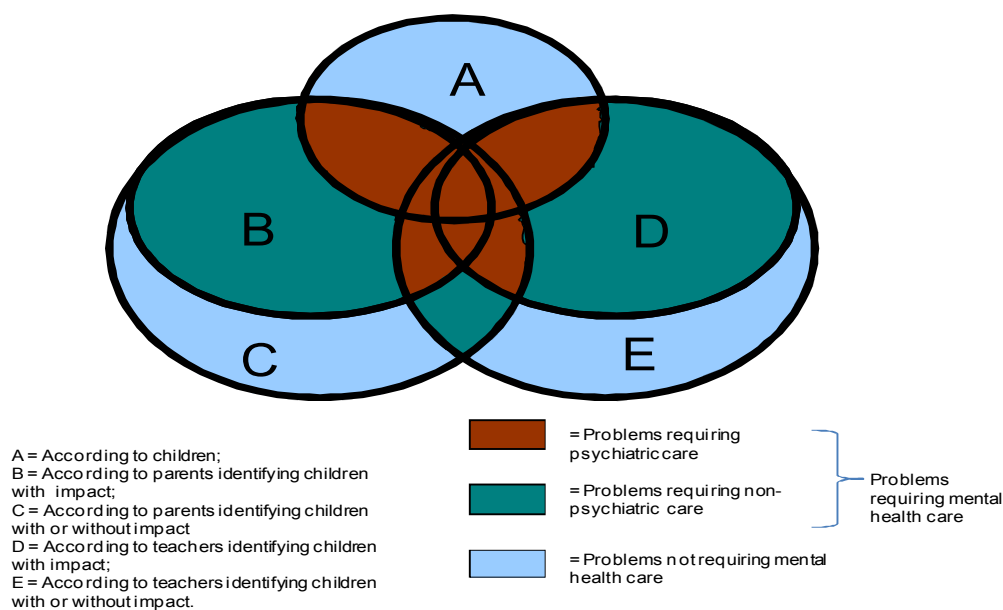
Parent's and Teacher's questionnaire

Mental health problems in children according to parents and teachers were assessed by using the Strength and Difficulties Questionnaire (SDQ) [37]. The SDQ consists of 25 items behavioral screening questionnaire for children aged from 4 to 16 years old. These 25 items were divided into 5 subscales: emotional symptoms, conduct problems, hyperactivity/inattention problems, peer relationship problems and prosocial behavior. A total difficulty score is the sum of the first four disorders listed above. SDQ provides three dimension probability categories: "absent", "possible" and "presence" using cut-off points reported by R. Goodman et al. (2000)[37].

Combined measurement

We also combined the information from three informants to define mental health needs in children with two levels. The first level is children with no mental health problems or mental health problems not requiring mental health care, and the second is those with mental health problems requiring mental health care.

Figure 2. Graphical depiction of mental health problems of children according to child, parental, and teacher questionnaire if impairment was identified (Source: SCMHE)



2.4 Measurements of independent variables

Information about child characteristics and socioeconomic characteristics of parents was collected through the questionnaires concerning the socio-demographic characteristics.

The parenting attitudes were measured by the Parenting Scale [38], a 30-item self-report scale covering 3 dysfunctional discipline styles: laxness, over-reactivity and verbosity. Parents indicate their tendencies to use specific discipline strategies using 7-point Likert scales, where 7 indicates a high probability of making the discipline mistake and 1 indicates a high probability of using an effective, alternative discipline strategy. The total score is the average of all items responses. For calculating scores regarding the 3 different dysfunctioning discipline styles, the average score of the responses on the items on that factor was calculated. According to Arnold et al. (1993), laxness was defined as the failure to respond consistently to misbehavior. Over-reactivity is considered as responding in an emotionally overcharged, harsh manner. Verbosity is frequent use of verbal means of addressing misbehavior, such as nagging and lecturing. Two dimensions were added to the parenting attitudes: autonomy and care, from the Parent Behaviors and Attitudes Questionnaire [39]. We used the European reference to classify laxness, over-reactivity and verbosity into 3 levels: Normal, Weak and Strong.

Regarding the parents' mental health questionnaire, the EU recommendations and the Eurobarometer on mental health were followed [40]. 3 SF-36-subscales were used [41]. This instrument evaluates not only negative mental health and the psychological distress but also positive mental health (Vitality). It has been also widely studied and validated in many languages (International Quality Of Life Assessment [IQOLA]) [42]. The SF-36 has good construct validity, high internal consistency and high test–retest reliability [43,44]. For the psychological distress, the score was built from the average calculated from the 5 items with 5- point Likert scale. A score of 56 or less indicated a case of mental ill-health. Positive mental health was covered by one of the 3 SF-36 subscales, Vitality. It was calculated from the average obtained from the 4 items (4-point Likert scale); a score above 70 meant a good level of vitality.

To evaluate the parental alcohol problems, the 10-item Alcohol Use Disorders Identification Test (AUDIT) [45], developed by the World Health Organization (WHO) was the most appropriate tool. For the smoking consumption, questions from different sources were adapted to SCMHE project.

2.5 Variables

2.5.1 Dependent variables/Outcome variables

Table 1. Description of dependent variables

Informants	Variables	Types
Children	Externalized disorders	Binary variables 0: No 1: Yes
	Internalized disorders	
Parent	Externalized disorders	
	Internalized disorders	
Teacher	Externalized disorders	
	Internalized disorders	
Combined information from 3 informants	Mental health needs 0: No mental problems or mental health problems without needs 1: Mental health problems with needs	Binary variable

2.5.2 Independent variables

Table 2. Description of independent variables

	Variables	Types
Child characteristics	Age (0: < 8years old;1: ≥ 8 years old)	Binary variable
	Gender (0: Boy; 1: Girl)	Binary variable
	Being the only child (0: No; 1: Yes)	Binary variable
	Origin status (0: Native ;1: Non-native)	Binary variable
Mother characteristics		
Socioeconomic characteristics	Age 1: ≤ 35 years old 2: > 35 and ≤ 40 years old 3: > 40 years old	Categorical variable
	Marital status 0: Lives with the father 1: Lives apart from the father	Binary variable
	Education level 1: Continued after high school 2: High school completed 3: High school not completed	Categorical variable
	Occupation (0: Employed; 1: Unemployed)	Binary variable
Maternal attitudes	Laxness (0: Normal/Weak; 1: Strong)	Binary variables
	Verbosity (0: Normal/Weak; 1: Strong)	
	Over-reactivity (0: Normal/Weak; 1: Strong)	
	Caring (0: Normal/Strong;1: Weak)	
	Autonomy (0: Normal/Strong; 1: Weak)	
Mental health of mother	Psychological distress (0: No; 1: Yes)	Binary variables
	Role emotional (0: No; 1: Yes)	
	Vitality (0: No; 1: Yes)	
Mother's consumptions of tobacco and alcohol problems	Current smoking status (0: No; 1: Yes)	Binary variables
	Alcohol problems (0: No; 1: Yes)	

2.6 Data analysis

Statistical analysis was performed using software STATA 11.2 and the significance was defined as a p-value <0.05 . We first began with the descriptive analysis as the basic step of the analysis procedure. In the univariate analysis, we used Chi Square test to find out any correlation between the origin status of the child and the mental health disorders from each informant as well as the combined measurement. At this step, binary logistic regression was conducted to calculate the crude odd-ratios of these relationships.

A multivariate logistic regression model was built to calculate the adjusted odd-ratios taking into account all variables.

2.7 Parental informed consent

Parents received the information letter with the consent letter to give back to the school with their response; if the parents did not send back the letter of consent with the clear refusal, the questionnaire was proposed to the three informants. Teachers were allowed to refuse to participate too; but when the school agreed with the survey, teachers were particularly involved too.

3. RESULTS

3.1 Descriptive analysis

Among a total of 958 Lithuanian children, 111 children (11.6%) are from the family in which at least one of the parents are not ethnic Lithuanian.

Age of the children ranges from 6 to 12 years old, with mean and standard deviation of 8.86 ± 1.19 years old. Children older than 8 years old are slightly more than those under 8 years old. In non-native children group, girls are slightly more than boys whereas in native group, sex is equally distributed. Children with only child status account for 10.64% in native group and 16.22% in non-native group.

Table 3. Child characteristics of 2 groups of native and non-native Lithuanian children

Child characteristics	Native children <i>N</i> = 847 (88.4%)	Non-native children <i>N</i> = 111 (11.6%)	P-value
<i>Age of the child (continuous variable)</i>	<i>N</i> = 837	<i>N</i> = 109	<i>p</i> = 0.618
	Mean \pm SD	Mean \pm SD	
	8.87 \pm 1.18	8.76 \pm 1.20	
<i>Age of the child</i>	<i>N</i> = 837	<i>N</i> = 109	<i>p</i> = 0.618
<8 yrs	340 (40.62)	47 (43.12)	
\geq 8 yrs	497 (59.38)	62 (56.88)	
<i>Gender of the child</i>	<i>N</i> = 845	<i>N</i> = 111	<i>p</i> = 0.309
Boy	424 (50.18)	50 (45.05)	
Girl	421 (49.82)	61 (54.95)	
<i>Single child</i>	<i>N</i> = 846	<i>N</i> = 111	<i>p</i> = 0.081
No	756 (89.36)	93 (83.78)	
Yes	90 (10.64)	18 (16.22)	

Regarding both child characteristics and mother characteristics, there is no significant difference of the proportion of children between two groups.

Table 4. Mother characteristics of 2 groups of native and non-native Lithuanian children

Mother characteristics	Native children N = 847 (88.4%)	Non-native children N = 111 (11.6%)	P-value
Age of mother	N = 836	N = 108	p = 0.662
=< 35 yrs	430 (51.44)	60 (55.56)	
(35,40] yrs	232 (27.75)	29 (26.85)	
>40yrs	174 (20.81)	19 (17.59)	
Marital situation of mother	N = 811	N = 101	p = 0.056
Lives with the father	673 (82.98)	76 (75.25)	
Lives apart from the father	138 (17.02)	25 (24.75)	
Education levels of mother	N = 737	N = 96	p = 0.695
Continued after high school	444 (60.24)	56 (58.33)	
High school completed	220 (29.85)	29 (30.21)	
High school not completed	73 (9.91)	11 (11.46)	
Occupation of mother	N = 767	N = 98	p = 0.377
Employed	460 (59.97)	62 (63.27)	
Unemployed	307 (40.03)	36 (36.73)	
Laxness	N = 726	N = 89	p = 0.932
Normal/Weak	601 (82.78)	74 (83.15)	
Strong	125 (17.22)	15 (16.85)	
Verbosity	N = 734	N = 92	p = 0.402
Normal/Weak	623 (84.88)	75 (81.52)	
Strong	111 (15.12)	17 (18.48)	
Overreactivity	N = 718	N = 87	p = 0.133
Normal/Weak	533 (74.23)	71 (81.61)	
Strong	185 (25.77)	16 (18.39)	
Caring	N = 728	N = 90	p = 0.101
Normal/Strong	550 (75.55)	75 (83.33)	
Weak	178 (24.45)	15 (16.67)	
Autonomy	N = 720	N = 94	p = 0.938
Normal/Strong	657 (91.25)	86 (91.49)	
Weak	63 (8.75)	8 (8.51)	
Psychological distress of mother	N = 751	N = 100	p = 0.576
No	582 (77.5)	75 (75)	
Yes	169 (22.5)	25 (25)	
Role emotional	N = 752	N = 99	p = 0.871
No	295 (39.23)	38 (38.38)	
Yes	457 (60.77)	61 (61.62)	
Vitality	N = 756	N = 100	p = 0.230
No	514 (67.99)	62 (62)	
Yes	242 (32.01)	38 (38)	
Mother's current smoking status	N = 771	N = 99	p = 0.442
Not current smoker	558 (72.37)	68 (68.69)	
Current smoker	213 (27.63)	31 (31.31)	
Mother's alcohol consumptions	N = 847	N = 111	p = 0.589
No alcohol consumptions	776 (91.62)	100 (90.09)	
Alcohol consumptions	71 (8.38)	11 (9.91)	

In terms of mental health disorders, in general more problems were seen in non-native children than native children according to all the informants. 25.5% of non-native children and 16.6% of native children reported to have internalized disorders when children are informants ($p = 0.022$). However, when parent or teacher is the informant, we found no significant differences between the proportion of non-native and native children for any disorders. Yet there is significant difference between two groups when using the combined measurement.

Table 5. Prevalence of mental health disorders in non-native and native children according to 3 informants and combined measurement

Informants	Native children N = 847 (88.4%)	Non-native children N = 111 (11.6%)	p-value
Children - DI questionnaires			
Total sample	N = 831	N = 110	
Internalized disorders			
Cases	138 (16.61%)	28 (25.45%)	p = 0.022
Externalized disorders			
Cases	50 (6.02%)	11 (10.0%)	p = 0.111
Parent			
Total sample	N = 835	N = 111	
Internalized disorders			
Cases	226 (27.07%)	35 (31.53%)	p = 0.323
Externalized disorders			
Cases	194 (23.23%)	20 (18.02%)	p = 0.217
Teacher			
Total sample	N = 834	N = 105	
Internalized disorders			
Cases	190 (22.78%)	24 (22.86%)	p = 0.986
Externalized disorders			
Cases	76 (9.11%)	11 (10.48%)	p = 0.650
Combined measurements			
Total sample	N = 822	N = 108	
Mental health problems requiring care	129 (15.69%)	16 (14.81%)	p = 0.813

Internalized disorders were more reported than externalized disorders due to three informants. Parents reported more cases of psychological disorders (both internalized and externalized disorders) than children or teacher, while children reported the least cases of their problems among informants.

3.2 Univariate analysis

Binary logistic regression was conducted with the origin status of the child as independent variable and mental health disorders as dependent variables according to each of 3 informants and combined measurement. The unadjusted odd ratios were calculated with 95%CI as shown in the table below.

Table 6. Binary logistic regression between the origin status of the child and mental health disorders according to 3 informants (children, parent and teacher) and combined measurement

Dependent variables	Independent variable: the origin of the child (Non-native vs. Native)
Children Questionnaires- the DI	
Internalized Disorders	1.7 (1.1 - 2.7)
Specific Phobia (SPh)	0.64 (0.23 - 1.82)
Separation Anxiety (SAD)	1.79 (1.03 - 3.11)
Generalized Anxiety (GAD)	1.2 (0.5 - 2.9)
Depression	0.8 (0.28 - 2.25)
Externalize Disorders	1.74 (0.87 - 3.44)
Opposition problems (OD)	1.84 (0.68 - 4.97)
Hyperactivity/Attention Deficit (ADHD)	1.27 (0.43 - 3.73)
Conduct disorders (CD)	1.12 (0.39 - 3.27)
Any Ex/Internalized Disorders	1.94 (1.3 - 3.0)
Parent Questionnaire (SDQ)	
Emotional Problems	0.73 (0.44 - 1.21)
Hyperactivity/Inattention Deficit	0.94 (0.55 - 1.60)
Conduct problems	1.5 (0.95 - 2.42)
Externalized Problems	1.24 (0.8 - 1.9)
Any Ex/Internalized Disorders	1.1 (0.73 - 1.64)
Teacher Questionnaire	
Emotional Problems	1.17 (0.6 - 2.3)
Hyperactivity/Inattention Deficit	1.13 (0.67 - 1.89)
Conduct problems	1.03 (0.6 - 1.8)
Externalized Problems	1.0 (0.62 - 1.63)
Any Ex/Internalized Disorders	1.15 (0.74 - 1.79)
Combined measure:	
Mental health needs	1.0 (0.55 - 1.80)

Results from the univariate analysis have shown that according to children, non-native children are at higher risk of internalized disorders compared with native children in Lithuania with OR (95%CI) = 1.7 (1.1 – 2.7). Specifically, non-native children experienced more separation anxiety than native ones OR (95% CI) = 1.79 (1.03 – 3.11).

As Lithuania is one of the European countries that has high rate of suicides, it is interesting to look at question 75 and 81 in the questionnaire for children (DI) referring to suicidal ideas. Question 75 is “think about death or killing one’s self”, and question 81 is “think about death or dying”. Although no association was found between the answer of the child to question 81 and the origin status of the child, results from the univariate analysis with question 75 showed that non-native children are more likely to think about death than native ones with crude OR = 1.6 (1.04 – 2.47).

Since we only found the significant association between the internalized disorders when children are informants and the origin status of the child, we decided to do the univariate analysis by choosing internalized disorders according to the Dominic Interactive questionnaires as the outcome variable and the child and mother characteristics as independent variables. First, we began with the whole population, and then the analysis was done with two groups of native and non-native children separately.

Regarding child characteristics, along with the origin status of the child, gender were found to be significant associated with internalized disorders in the whole children population as well as in each group. Girls are at higher risk for internalized disorders than boys in the total population with unadjusted OR = 1.92 (1.36 – 2.71). After the stratification of the origin of the child, girls are at higher risk for internalized disorders compared with boys in both native group and non-native group with ORs of 3.69 (1.48 – 9.19) and 1.75 (1.20 – 2.54) respectively.

Table 7. Univariate analysis between child characteristics and internalized disorders according to DI

Child characteristics	Total population Unadjusted OR	Native children Unadjusted OR	Non-native children Unadjusted OR
<i>Age (>= 8 years old/<8years old)</i>	0.74 (0.53 - 1.04)	0.78 (0.53 - 1.13)	0.61 (0.26 - 1.43)
<i>Gender (Girl/Boy)</i>	1.92 (1.36 - 2.71)	1.75 (1.20 - 2.54)	3.69 (1.48 - 9.19)
<i>Being the only child in the family (Yes/No)</i>	0.82 (0.46 - 1.44)	0.87 (0.46 - 1.62)	0.53 (0.14 - 1.99)
<i>Origin status of the child (Non- native/Native child)</i>	1.74 (1.09 - 2.76)		

Table 8. Univariate analysis between mother characteristics and internalized disorders according to DI

Mother characteristics	Total population <i>Unadjusted ORs</i>	Native children <i>Unadjusted ORs</i>	Non-native children <i>Unadjusted ORs</i>
Socioeconomic characteristics			
<i>Age</i> Ref: =< 35 years old			
> 35 and =<40 years old	1.21 (0.82 - 1.79)	1.12 (0.73 - 1.73)	1.87 (0.70 - 4.98)
> 40 years old	1.25 (0.81 - 1.92)	1.32 (0.84 - 2.09)	0.91 (0.25 - 3.27)
<i>Marital status</i>			
	1.47 (0.95 - 2.27)	1.5 (0.93 - 2.40)	1.15 (0.41 - 3.26)
<i>Education level</i> Ref: Continued after the school			
High school completed	1.21 (0.83 - 1.77)	1.26 (0.84 - 1.91)	0.95 (0.35 - 2.56)
High school not completed	1.41 (0.79 - 2.52)	1.38 (0.72 - 2.67)	1.4 (0.38 - 5.15)
<i>Occupation level (Inactive/Active)</i>			
	1.4 (0.99 - 1.98)	1.39 (0.95 - 2.04)	1.60 (0.66 - 3.89)
Maternal attitudes			
<i>Laxness</i>	1.24 (0.76 - 2.02)	1.43 (0.87 - 2.36)	0.45 (0.09 - 2.32)
<i>Verbosity</i>	1.47 (0.94 - 2.03)	1.56 (0.97 - 2.49)	0.99 (0.24 - 3.99)
<i>Over-reactivity</i>	1.0 (0.66 - 1.54)	1.18 (0.77 - 1.83)	0.27 (0.03 - 2.27)
<i>Caring</i>	1.86 (1.23 - 2.81)	1.97 (1.26 - 3.08)	1.59 (0.48 - 5.26)
<i>Autonomy</i>	2.15 (1.22 - 3.80)	2.24 (1.23 - 4.10)	1.7 (0.38 - 7.59)
Maternal mental health			
<i>Psychological distress</i>	1.27 (0.85 - 1.88)	1.36 (0.87 - 2.12)	0.81 (0.27 - 2.41)
<i>Role emotional</i>	1.03 (0.71 - 1.49)	0.94 (0.64 - 1.38)	1.35 (0.52 - 3.56)
<i>Vitality</i>	1.0 (0.70 - 1.42)	1.01 (0.67 - 1.54)	1.0 (0.39 - 2.59)
Consumptions of tobacco & alcohol problems			
<i>Current smoking status</i>	1.67 (1.17 - 2.38)	1.69 (1.15 - 2.50)	1.45 (0.56 - 3.77)
<i>Alcohol problems</i>	1.31 0.75 - 2.29)	1.47 (0.80 - 2.68)	0.62 (0.12 - 3.04)

Concerning mother characteristics, low caring, low autonomy and being a current smoker are risk factors for internalized disorders in native children in Lithuania with ORs (95%CI) of 1.97 (1.26 – 3.08), 2.24 (1.23 – 4.10), 1.69 (1.15 – 2.50) respectively. However, we found no significant association between mother characteristics and internalized disorders in non-native children.

3.3 Multivariate analysis

A model of multivariate logistic regression with all variables of child characteristics as well as mother characteristics was set up. Adjusted odd-ratios with 95% CI were calculated. Results from the analysis were shown in the table below.

Table 9. Multivariate analysis between child characteristics and internalized disorders according to DI

Child characteristics	Total population (Adjusted OR (95% CI))	Native children (Adjusted OR (95% CI))	Non-native children (Adjusted OR (95% CI))
<i>Age (>= 8 years old/<8years old)</i>	0.67 (0.46 - 0.96)	0.66 (0.44 - 0.99)	0.64 (0.22 - 1.80)
<i>Gender (Girl/Boy)</i>	2.1 (1.46 - 3.03)	1.85 (1.24 - 2.76)	4.56 (1.39 - 14.9)
<i>Being the only child in the family (Yes/No)</i>	0.83 (0.46 - 1.52)	0.95 (0.49 - 1.84)	0.55 (0.1 - 3.07)
<i>Origin status of the child (Non-native/Native child)</i>	1.87 (1.14 - 3.06)		

After control for other variables, results from the multivariate analysis have shown that gender and the origin status of the child are still significantly associated with the internalized disorders using the DI questionnaire. Being a girl and belonging to non-native children group are the two risk factors for the internalized disorders. Children with non-native Lithuanian origin are at higher risk of having internalized disorders than native children with adjusted OR = 1.87 (1.14 – 3.06).

In the univariate analysis, age was not significantly associated with internalized disorders, however, after adjusted; age of the child appeared to be significantly associated with internalized disorders but only in native children. Being older than 8 years old is a protective factor for internalized disorders in native children with OR = 0.66 (0.44 – 0.99).

Table 10. Multivariate analysis between mother characteristics and internalize disorders according to DI

Mother characteristics	Total population (Adjusted OR (95% CI))	Native children (Adjusted OR (95% CI))	Non-native children (Adjusted OR (95% CI))
Socioeconomic characteristics			
<i>Age</i>			
Ref: =< 35 years old			
> 35 and =<40 years old	1.36 (0.89 - 2.08)	1.27 (0.79 - 2.02)	2.69 (0.72 - 10.04)
> 40 years old	1.29 (0.80 - 2.08)	1.37 (0.82 - 2.29)	0.85 (0.17 - 4.30)
<i>Marital status</i>	1.25 (0.79 - 2.00)	1.31 (0.79 - 2.16)	1.06 (0.28 - 3.95)
<i>Education level</i>			
Ref: Continued after the school			
High school completed	0.96 (0.63 - 1.47)	1.0 (0.63 - 1.60)	0.93 (0.27 - 3.26)
High school not completed	0.83 (0.42 - 1.63)	0.81 (0.38 - 1.75)	0.77 (0.11 - 5.51)
<i>Occupation level (Inactive/Active)</i>	1.28 (0.87 - 1.89)	1.21 (0.79 - 1.86)	1.73 (0.52 - 5.79)
Maternal attitudes			
<i>Laxness</i>	1.04 (0.61 - 1.75)	1.16 (0.68 - 1.97)	0.46 (0.06 - 3.41)
<i>Verbosity</i>	1.27 (0.78 - 2.05)	1.32 (0.79 - 2.19)	1.3 (0.19 - 9.03)
<i>Over-reactivity</i>	0.87 (0.55 - 1.38)	0.97 (0.61 - 1.55)	0.22 (0.01 - 3.53)
<i>Caring</i>	1.95 (1.24 - 3.04)	1.96 (1.19 - 3.21)	1.34 (0.29 - 6.31)
<i>Autonomy</i>	2.0 (1.05 - 3.79)	1.91 (0.96 - 3.78)	2.81 (0.34 - 23.5)
Maternal mental health			
<i>Psychological distress</i>	1.18 (0.73 - 1.91)	1.22 (0.73 - 2.05)	0.87 (0.16 - 4.67)
<i>Role emotional</i>	0.84 (0.57 - 1.24)	0.79 (0.52 - 1.19)	0.83 (0.23 - 2.96)
<i>Vitality</i>	1.19 (0.78 - 1.81)	1.22 (0.73 - 2.05)	1.65 (0.38 - 7.21)
Consumptions of tobacco & alcohol problems			
<i>Current smoking status</i>	1.66 (1.12 - 2.46)	1.66 (1.08 - 2.55)	1.93 (0.49 - 7.60)
<i>Alcohol problems</i>	0.89 (0.47 - 1.66)	0.99 (0.51 - 1.95)	0.71 (0.09 - 5.71)

Regarding mother characteristics, no associations were found between the characteristics of mother and internalized disorders assessed by the DI questionnaires in the group of non-native children. In group of native Lithuanian children, children who receive low caring from the mother and whose mother is a current smoker are at risk for internalized disorders with adjusted OR of 1.96 (1.19 – 3.21) and 1.66 (1.08 – 2.55) respectively.

We also ran the multivariate logistic regression with the same procedure with question 75 as the dependent variable. We found that marital status of mother and the origin status of the child are the two risk factors for suicidal thinking in the children in Lithuania after controlling for other variables. Non-native children are more likely to think about death than native children with adjusted OR = 1.6 (1.02 – 2.52). With respects to marital status of mother, children whose mother is living apart from father are more prone to suicidal thinking than those who are living with both of parent with adjusted OR = 1.6 (1.04 – 2.47).(See table 11)

Table 11. Multivariate logistic regression with Question 75

Child characteristics	Adjusted OR (95% CI)	Mother characteristics		Adjusted ORs (95% CI)
Age (>= 8 years old/<8years old)	1.05 (0.75 – 1.45)	Socioeconomic characteristics	Age Ref: =< 35 years old	
Gender (Girl/Boy)	0.93 (0.68 – 1.27)		> 35 and =<40 years old	0.95 (0.65 – 1.40)
Being the only child in the family (Yes/No)	1.06 (0.64 – 1.76)		> 40 years old	0.71 (0.45 – 1.12)
Origin status of the child (Non-native/Native child)	1.60 (1.02 – 2.52)*		Marital status (Living with father/Living apart from father)	1.60 (1.04 – 2.47)*
			Education level Ref: Continued after the school	
			High school completed	0.87 (0.59 – 1.28)
			High school not completed	0.56 (0.29 – 1.10)
			Occupation level (Inactive/Active)	1.27 (0.90 – 1.81)
		Maternal attitudes	Laxness (Strong/normal & weak)	1.34 (0.86 – 2.09)
			Verbosity (Strong/normal & weak)	0.98 (0.61 – 1.58)
			Over-reactivity (Strong/normal & weak)	1.38 (0.93 – 2.05)
			Caring (Weak/Normal & Strong)	1.28 (0.82 – 1.99)
		Maternal mental health	Autonomy (Weak/Normal & Strong)	1.12 (0.59 – 2.13)
			Psychological distress (Y/N)	1.0 (0.64 – 1.56)
			Role emotional (Y/N)	0.77 (0.53 – 1.14)
			Vitality (Y/N)	1.24 (0.82 – 1.86)
		Consumptions of tobacco & alcohol problems	Current smoking status (Y/N)	1.35 (0.91 – 1.99)
			Alcohol consumptions (Y/N)	1.71 (0.99 – 2.92)

*: p < 0.05

4. DISCUSSION

Comparing with other countries in the database of SCMHE, Lithuanian sample is the most representative sample of the main population with the highest proportion of non-native children in the total population (11.6%). Despite the absence of differences between the non-native and native children in terms of mental health disorders when parent or teacher is informant as well as combined measurement, we found a significant difference between these two groups regarding internalized disorders when children are informants. Belonging to non-native children group is a risk factor for internalized disorders in Lithuania. Since our target population is school children aged 6 - 11 years old, we have hypothesis that their parents were in Lithuania before 1990. Looking back at the historical context of Lithuania that was mentioned in the introduction, Russians attributed for about 9.4% of the population in Lithuania at that time (Soviet National Census 1989), making them one of the most popular minority ethnic in Lithuania. It is the rationale for our hypothesis that the majority of non-native children in Lithuania may come from the family that at least one of parent has ethnic Russian. To our knowledge, there is lack of literature focusing on the effect of being children of people who were sent to another country to populate that country on children mental health. Lithuania is a good example since during the period of Soviet Union occupation; it was affected by the russification policy of Soviet Union. It is not out of our prediction that non-native children coming from Russian population in Lithuania are at higher risk for mental health problems, which can be explained by the disadvantages that these children have experienced as the consequences of the complicated conflicts between the two countries in the history.

Our study also suggested that girls are at higher risk for internalized disorders than boys. These findings are consistent with other studies in which have showed that girls are more likely to have emotional problems while boys present externalized problems. Although being a girl was found to be a risk factor for non-native children with OR (95%CI) of 4.56 (1.4 – 14.9) which indicates a strong association, it is noticeable that there is a wide range of confidential interval of OR. It may be explained by the fact that there are not many cases of girls having internalized disorders in non-native children group (19 cases).

Concerning mother characteristics, in multivariate analysis, low caring and current smoking status are two risk factors that was found to be significantly associated with internalized disorders in native children, but not in non-native children. Since there are only 111 non-native children compared with 847 native children, it prevents us from finding these relationships in the group of non-native children.

With respects to the level of psychological disorders, few studies took into account different informants. One of our strengths is that we used three informants (children, parents and teacher) to assess the mental health problems in children. We made the combined measurements based on information from the three informants although no significant difference has been found between non-native and native group. It is suggested that the reliability of measurements of mental health problems in children can be improved by combining the reports from multiple sources as this approach improves the accuracy in prediction of mental disorders and estimates of a psychiatric diagnosis [46,47].

It is well-known that prevalence of mental health problems in children depends highly on the informant used to assess these problems [48]. Different informants give us different results on problem behavior in children. Our study only detected the significant difference between non-native and native children in terms of internalized disorders when children are informants, but we did not detect any significant differences between the two groups when the informant is parent or teacher as well as using combined measurement. Additionally, parents reported the most mental health problems of their children, followed by teacher and then children. The inconsistency between informants may be explained by the fact that child is seen in different contexts (family versus school context) and different interaction with the child between parents and teachers [48]. Different tools administrated to parents/teachers (SDQ) and children (DI) can be accounted for different assessments among informants since DI is more detailed and accurate compared with SDQ. Moreover, children of low socioeconomic class tends to report more internalized disorders. Parent- and self-reports can lead to bias since migrant parents and children may underreport mental health problems in children as the consequences of their awareness of their low status in the society, and thus, do not want to tell about their problems [49]. We suggest that future studies need to be carried out, taking into account assessments of different informants in their designs.

Since data for our study was taken from the cross-sectional survey (SCHME), one of our limitations as well as one of the disadvantages of cross-sectional study is that we cannot judge the direction of causality. We are only able to formulate the hypotheses regarding the risk factors for mental health problems. For example, child's mental problems can undermine parental mental health. Longitudinal study to follow up these children is recommended to provide stronger evidence. Second, we do not have specific information of the nationality of mother and father. It is difficult to have a precise estimation of how many non-native children whose at least one of parents has ethnic Russians. Moreover, after gaining independence in 1990, the Lithuanian government offered citizenship to every person who lived in Lithuania by the time of the dissolution of USSR – regardless of ethnicity, languages spoken or family history. Many Russians did change their citizenship to be Lithuanians. Thus, the number of Russians in Lithuania may be underestimated.

The parent-report questionnaires were completed by a single informant. The general situation happened in every participating country in SCHME project is that the majority of respondent is the mother. In case of Lithuania, 92.8% of respondent is mother versus 7.2% responds coming from father. There are differences in answers to the parent questionnaire between mother and father regarding parenting attitudes and behaviors, mental health status, consumption of smoke, alcohol problems and assessment of child mental health problems, which can lead to bias. To avoid this problem, we decided to use the information adjusted for mother only.

In our study, socioeconomic characteristics of mother were assessed by using age, marital status, and education and occupation level of mother. Although income is considered as one of primary indicators for socioeconomic status, it was not included in the parent's questionnaire. Therefore, we do not have information of income of parents. Consequently, the absence of information of income can have some effects on the relation between socioeconomic characteristics of mother and mental health problems in children of non-native and native group.

Missing data is another problem that we met during our study. Concerning data on maternal attitudes, maternal mental health and consumption of smoke, about 10% - 15% of 958 observations were missing, which can bias our results. Since the percentage of missing observations is not quite high (10-15%), in order to deal with this problem, multiple imputation using chained equations was used with 10 imputations. We suggest that sensitivity analysis will be carried out in the future.

5. CONCLUSION

Findings from our study contribute to the knowledge of mental health problems among immigrant children that being a non-native child is a risk factor for internalized disorders using the Dominique Interactive questionnaire. In addition, gender of the child, maternal attitudes such as caring and autonomy and mother's consumption of tobacco were found to be significantly associated with internalized disorders in children in Lithuania. In terms of child characteristics, being a girl is a risk factor for both groups of non-native and native children. Our results are consistent with those of others.

Regarding question 75 in the DI questionnaire, our findings showed a significant association between the origin of the child and suicidal thinking. Specifically, non-native children are more likely to answer "Yes" to the question of think about death or killing one's self than native ones. Marital status of mother was also found to be independently associated with suicidal thinking in children in Lithuania. Having a lone mother is a risk factor for suicidal thinking in children. However, this issue should be further studied.

We also bring a new insight into children mental health concerning their self-report on their mental health problems. With respects to internalized disorders, children are important informants since teachers have low capacity to recognize the children's internalized disorders and parents usually underreport these problems in children.

Our study suggests that non-native children should receive more attention from community and government. Prevention program including parenting support should be targeted to raise parents' awareness of their children's mental problems.

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APPENDIX



Illustration of one item in the Domique Interactive

Description of the DI Diagnosis Variables

Phobic	9	2, 6, 9, 12, 18, 25, 29, 35, 38	0/2=0 3/4=1 5/9=2	From 5 to 9
Separation anxiety	8	3, 17, 20, 24, 27, 30, 34, 36	0/4=0 5=1 6/8=2	From 6 to 8
Generalised anxiety	15	5, 8, 10, 14, 16, 19, 21, 23, 26, 31, 32, 50, 51, 62, 68	0/9=0 10/11=1 12/15=2	From 12 to 15
Depression	20	23, 31, 41, 43, 47, 48, 50, 51, 54, 58, 61, 62, 64, 68, 72, 75, 78, 81, 82, 83	0/10=0 11/13=1 14/20=2	From 14 to 20
Oppositional defiant	9	4, 7, 13, 15, 23, 28, 31, 37, 39	0/4=0 5/6=1 7/9=2	From 7 to 9
Conduct	14	40, 45, 48, 51, 53, 57, 60, 62, 65, 69, 71, 74, 79, 82, 84, 85, 87, 88, 89,	0/2=0 3/5=1 6/14=2	From 6 to 14
ADHD	19	7, 42, 46, 49, 52, 56, 59, 63, 67, 70, 73, 76, 80, 86	0/10=0 11/13=1 14/19=2	From 14 to 19
Difficulties	10	1, 11, 22, 33, 44, 55, 66, 77, 90, 91	8/10=0 7=1 0/6=2	From 0 to 6

Description of the SDQ Diagnoses Variables

SDQ Diagnoses	Abbreviations used	Items number	Classes values depending on the scores
SDQ Emotional problems	"Emotion"	3, 8, 13, 16, 24	P: 0/3="unlikely"; 4="possible"; 5/10="probable" T: 0/4="unlikely"; 5="possible"; 6/10="probable"
SDQ Conduct problems	"Conduct"	5, 7, 12, 18, 22	P&T: 0/2="unlikely"; 3="possible"; 4/10="probable"
SDQ Hyperactivity problems	"Hyper"	2, 10, 15, 21, 25	P&T: 0/5="unlikely"; 6="possible"; 7/10="probable"
SDQ Peer relation problems	"Peer"	6, 11, 14, 19, 23	P: 0/2="unlikely"; 3="possible"; 4/10="probable" T: 0/3="unlikely"; 4="possible"; 5/10="probable"
SDQ Total difficulties	"Total"	2, 3, 5, 6, 7, 8, 10, 11, 12, 13, 14, 15, 16, 18, 19, 21, 22, 23, 24, 25	P: 0/13="unlikely"; 14/16="possible"; 17/40="probable" T: 0/11="unlikely"; 12/15="possible"; 16/40="probable"
SDQ Impact	"Impact"	P: Distress, home life, Friendships, classroom learning, leisure activities T: Distress, friendships, classroom learning	P: 0="unlikely"; 1="possible"; 2/8="probable" T: 0="unlikely"; 1/4="probable"
SDQ Prosocial (positive)	"Prosocial"	1, 4, 9, 17, 20	P&T: 6/10="unlikely"; 5="possible"; 4/2="probable"

Note: "P" means SDQ Parent scoring; "T" means SDQ Teacher scoring

Description of the SF – 36 subscales for parents

Diagnosis types	Items	Presence of a Diagnosis
Psychological distress	G4.b. Have you felt particularly nervous? G4.c. Have you felt so down in the dumps nothing could cheer you up? G4.f. Have you felt downhearted and miserable? G4.h. Have you been happy? (Values are inversed) G4.d. Have you felt calm and peaceful? (Values are inversed)	score upon 56
Vitality	G4.a. Did you feel full of life? G4.e. Did you have lots of energy? G4.g. Did you feel worn out? (Values are inversed) G4.i. Did you feel tired? (Values are inversed)	score upon 70
Role Emotional	G1.a. Have you cut down on the amount of time you spent on work or other activities? G1.b. Have you accomplished less than you would like? G1.c. Did you not do work or other activities as carefully as usual? G1.d. Have you missed worked days?	At least 2 "yes" at these 4 questions

Consent form for parent

School Children Mental Health in Europe Project

SCMHE PROJECT



A study which aims to evaluate and identify the main determinants of 6-11 year old children external and internal problems in 7 European countries

Please circle one answer

I voluntarily consent to take part in this study **YES** **NO**

I have read the information leaflet and understand the nature and purpose of the study. I understand that I will be free to withdraw from the study at any time without having to give a reason for withdrawal, and that this decision will not affect any services my family receives now or in the future.

I understand that all the information supplied will be kept confidential to the study team and that no information which could identify me personally or my family will be released to anyone outside the study team.

Name: Mr/Mrs/Ms.....

Signature.....Date.....

For further information contact: [name of the main researcher and interviewer + Telephone numbers etc](#)

I give my consent for my child to be asked if he/she would like to take part in an interview about his/her mental health feelings and behaviour.

My child's name is: _____

Signed: _____

I give my consent for the teacher in charge of my child to be asked if they would like to take part in an interview about his/her experience with my child.

The teacher's name is: _____

Signed: _____