

Growth and nutritional status of migrant and minority children: The case of Macedonian and Albanian children in Slovenia and Macedonia

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Abstract

This paper presents the initial findings of the research cooperation between Slovenian and Macedonian researchers investigating environmental effects on children's growth and development. The study includes five different groups of children: Macedonian majority children who live in Macedonia, Albanian minority children who live in Macedonia, Macedonian children from migrant families who live in Slovenia, Albanian children from migrant families who live in Slovenia, and the population data of children who live in Slovenia. The first round of measurements, organised in the 2000/2001 school year, are presented. The findings show that the differences in stature, body mass, triceps skinfold thickness, and BMI between Macedonian and Albanian children living in Macedonia were bigger than the differences between the children of both migrant ethnic groups living in Slovenia. Macedonian children living in Macedonia were much more inclined towards pre-obesity and obesity than their Albanian peers were. When the migrant Albanian and Macedonian children in Slovenia were observed, the differences almost disappeared, although the observed rates of obesity were also higher among migrant children in Slovenia in comparison to Albanian and Macedonian children living in Macedonia. The differences in stature, body mass, triceps skinfold thickness and BMI between the migrant groups of children and population of children in Slovenia were very small, and there were no significant differences in pre-obesity and obesity rates.

KEYWORDS: obesity, growth, children, migrant, minority, Slovenia, Macedonia

Introduction

The existing evidence on the physical development and growth of children of migrant families suggests that they experience more difficulties than their peers from the host communities do. All the economic, social, and environmental challenges that accompany

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migration and integration into new social settings may also affect the health and physical development of migrant children (Will et al. 2005). Migrant children are more likely to experience behavioural problems than their non-migrant peers are (Kouider et al. 2014) due to their social exclusion; moreover, their underprivileged position can also influence their physical development and health. There is strong evidence on the inverse socio-economic-status gradient with regards to childhood obesity (Kirchengast & Schober 2006; Knai et al. 2012; Bammann et al. 2013) since many migrant children very often live in less favourable socioeconomic conditions than their peers from the host communities do, and they are very often not sufficiently physically active (Lampert et al. 2007). This is why migrant children often experience higher health risks, while the risk of becoming overweight increases with the duration of their stay in the host country (Schenk et al. 2008).

In this regard, children with migrant history seem to be a disadvantaged group with regards to health inequalities, but thus far, there is limited evidence about the developmental prospects of economic migrant children in the richer host countries in comparison to those whose families remained in their countries of origin.

Migrant populations in the host countries are becoming “new minorities” although the children from “old” minority groups also experience higher risks of obesity and poorer developmental prospects due to either the lower economic and educational levels of the minority families to social exclusion deriving from cultural and linguistic differences. Higher rates of obesity have been persistently evidenced among minority children in industrialised countries, be they Sami and Finnish minority children in Norway (Kokkvoll et al. 2012), Roma children in Spain (Poveda et al. 2014), Inuit in Canada (Galloway et al. 2010), Native American minority children in the USA (Sugarman et al. 1990), or Maori children in New Zealand (Turnbull et al. 2004).

The aim of the study

In order to verify the growth and nutritional status of migrant children in the host country and of their contemporary peers from the countries of their origin, two groups of researchers, one from the Faculty of Sport of the University of Ljubljana, Slovenia, and the other one from the Faculty of Physical Education, Sport and Health of the St. Cyril and Methodius University Skopje, Macedonia, harmonised parts of their protocols of gathering data on children’s physical and motor development. The aim of this paper, however, is only to present the differences in stature, body weight, triceps skinfold thickness, BMI, and nutritional status between Macedonian and Albanian children who live in Macedonia and the children of both ethnic groups who live in economic migrant families in the host country Slovenia. Additionally, the growth and nutritional status in both migrant groups of children in Slovenia were compared to Slovenian population data to assess the possible effects of the disadvantaged socio-economic status of the migrant children on their development. At the same time, the relations between the minority status of Albanians in Macedonia with their nutritional status and growth was observed to determine whether their minority position could affect their developmental prospects. The unique combination enabled us to observe whether the differences in growth and nutritional status between the majority Macedonian population and the minority Albanian

population in Macedonia disappear when they both become minority groups in the host country, Slovenia.

The research settings

The first round of research was conducted in Macedonia and Slovenia in a time span of five months. In Macedonia, children were measured in November and December 2000 and in Slovenia four to five months later in April and May 2001.

Macedonia and Slovenia share a common history since they were both part of Yugoslavia between 1945 and 1991. Throughout this period, Slovenia had the strongest economic growth and was considered the most developed of all the Yugoslav republics. After the collapse of Yugoslavia, Slovenia was the first of the ex-Yugoslav states to join the EU and has the highest GDP of those states. In comparison, the GDP of Slovenia in 2015 was 18,682 EUR per capita, while the GDP of Macedonia was 4,393 EUR per capita (FocusEconomics 2016). In this regard, Macedonia has had many fewer resources for the development of public services related to physical activity and nutrition policies of children since 1991; consequently, children in Macedonia have also had fewer opportunities for school-based physical activity due to lack of school sport infrastructure and other related factors. Additionally, the available evidence shows that children in Slovenia are more physically active than children in Macedonia are (Gontarev 2008; Sember et al. 2016), which could also be a reflection of the physical development of children and levels of obesity.

Macedonians are the majority population in Macedonia and also are a minority group in the neighbouring northern Greece, western Bulgaria, eastern Albania, and southern Serbia. Albanians are a minority group in eastern Macedonia, Greece and Montenegro but a majority group in Albania and neighbouring Kosovo. In Slovenia, Macedonians and Albanians are economic migrants who started migrating there in the Yugoslav era, but their migration intensified, especially among Albanians, after the breakup of Yugoslavia (Figure 1).

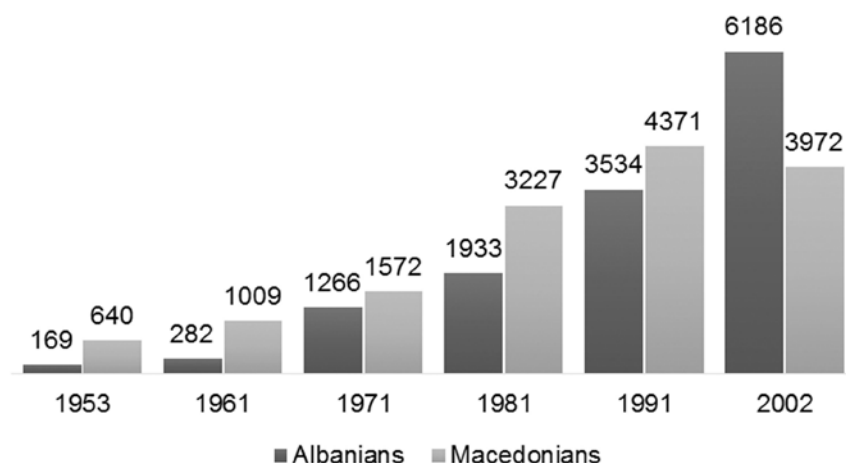


Figure 1: Growth trends of Macedonian and Albanian population in Slovenia

In 1981, the share of Macedonians in the population of Slovenia was 0.17% and the share of Albanians 0.10%, while in 2002 the share of Macedonians doubled to 0.2% but the share of Albanians tripled to 0.31% (Kokole 1986; Komac 2007). Macedonian and Albanian migrants in Slovenia have been mostly employed as manual workers (Klopčič et al. 2003), and the average level of education of these two migrant groups has been much lower than that of Slovenians (Bešter 2007).

In Macedonia, Albanians are the largest ethnic minority. In 1961, 71.2% of the population was Macedonian and 13% was Albanian. The share of Albanians increased in the 1971 census: 69.3% to 17%. In 1981, the census showed 67% Macedonians to 19.8% Albanians, and in 1991 the shares were 65.3% to 21.7% (Tanevski 2005). In the 2002 census, the share of Macedonians fell again against Albanians: 64.2% to 25.2% (Kostadinova-Daskalovska 2005).

The sample

The sample included children from Macedonia and Slovenia, from age 10 to 14 (Table 1) and results of their measurements were finally compared to the results of the entire population of children in Slovenia. The rates of overweight and obesity of the 10- to 14-year olds in 2001 were in concordance with previously published data (Kovač, Jurak & Leskošek 2012). In Macedonia, the measurements were conducted in 14 primary schools throughout the country while in Slovenia, the measurements were conducted in all Slovenian primary schools, including over 96% of the entire population of children from 10 to 14. Children from the Macedonian and Albanian ethnic groups in Slovenia were in 266 schools from all parts of Slovenia.

Table 1: Sample size by age, sex, nationality and location

Country	Group	10 yrs	11 yrs	12 yrs	13 yrs	14 yrs	Sum
SI	Macedonian boys	18	46	43	39	49	195
	Albanian boys	44	45	43	52	32	216
	Population boys*	10351	10741	11285	11644	10849	54870
	Macedonian girls	41	34	41	37	47	200
	Albanian girls	33	40	35	40	30	178
	Population girls*	9909	10002	10837	11261	10537	52546
MK	Macedonian boys	42	117	129	128	76	492
	Albanian boys	20	45	57	39	26	187
	Macedonian girls	30	117	122	123	70	462
	Albanian girls	21	51	41	39	36	188

Legend: SI – Slovenia, MK – Macedonia, *number of all included children in Slovenia

Altogether, the sample included 1,349 Macedonian and 769 Albanian children from Macedonia and Slovenia. Age groups of children were determined by truncating age at the time of measurement to an integer; for example, children, aged from 10 to 10.99 years were included in the age group of 10-year olds. In all age groups, there were statistically significant differences in age between different groups (Table 2).

Table 2: Age of the sample by sex, nationality and location in months

Country	Group	10 yrs	11 yrs	12 yrs	13 yrs	14 yrs
SI	Macedonian boys	126.0	138.0	150.0	162.0	173.9
	Albanian boys	126.1	137.9	150.4	162.5	174.2
	Population boys	126.0	138.0	150.0	162.0	173.9
	Macedonian girls	125.6	137.7	149.4	162.7	173.1
	Albanian girls	127.4	137.5	150.3	160.9	174.1
	Population girls	126.0	138.0	150.1	162.0	173.9
MK	Macedonian boys	129.7	137.8	150.0	161.7	172.0
	Albanian boys	128.3	138.2	149.8	162.1	172.9
	Macedonian girls	129.5	137.7	150.0	161.9	172.3
	Albanian girls	128.3	137.7	149.6	161.1	171.8

Legend: SI – Slovenia, MK – Macedonia

In the age group of 10-year-old boys, Albanian boys living in Slovenia were significantly younger (-3.6 months) than Macedonian boys living in Macedonia while the population of 10-year-olds from Slovenia was significantly younger than Macedonian (-3.7 months) and Albanian (-2.3 months) 10-year-olds. In the age group of 11-, 12- and 13-year-old boys, there were no differences in mean age. In the age group of 14-year-old boys, the Macedonian boys living in Macedonia were significantly younger than Macedonian boys living in Slovenia (-2.1 months) and Albanian boys living in Slovenia (-2.2 months) as well as the population of 14-year-old Slovenian children (-1.9 months).

In the age group of 10-year-old girls, Macedonian girls living in Slovenia were significantly younger than Macedonian girls (-3.9 months) and Albanian girls (-2.7 months) living in Macedonia. At the same time, 10-year-old Macedonian and Albanian girls living in Macedonia were significantly older than the population of 10-year old girls from Slovenia (-3.5 and -2.4 months, respectively). In the age group of 11-, 12- and 13-year-old girls there were no differences in mean age. In the age group of 14-year-old girls, Albanian girls and Macedonian girls (-1.6 and 2.1 months, respectively) living in Macedonia were significantly younger than the population of 14-year-old girls from Slovenia.

The research methods

Measurements of stature, body mass, and triceps skinfold thickness (TSF) were conducted using medical scales of various brands, standard stadiometers of various brands, and Holtain skinfold callipers. Stature was measured to the nearest 0.5 cm, body mass to the nearest 0.5 kg and TSF to the nearest 1 mm on the left side of the body. Body mass index (BMI) was calculated as mass (kg) divided by the square of stature (m). The nutritional status of children was assessed by the BMI curves of the World Obesity Federation (WOF), the former International Obesity Task Force (Cole et al. 2000; Cole & Lobstein 2012) despite the limitations of their use on the Slovenian population (Starc & Strel 2011).

In Macedonia, the measurements were conducted by a team, qualified in anthropometry, which travelled from school to school and was assisted by physical education teachers, while in Slovenia the measurements were conducted within the annual measurements

and according to the protocol of the SLOfit surveillance system (Strel et al. 1997) by physical education teachers, assisted by classroom teachers. The data in Macedonia was processed at the Faculty of Physical Education, Sport and Health of the St. Cyril and Methodius University Skopje while the data in Slovenia was processed at the Faculty of Sport, University of Ljubljana, which has been managing the SLOfit surveillance system since 1981.

The data was analysed with IBM SPSS 23 software. Differences between the physical status of the analysed groups were analysed by the One-Way ANOVA with Tukey or Games-Howell posthoc test for every age group and sex. Z-scores of all measurements were calculated on the joint dataset of Albanian, Macedonian, and Slovenian children from Macedonia and Slovenia (N=109,540) by Rankit procedures to enable the overall comparison by controlling for age and sex. Nutritional status and the differences between Macedonian and Albanian children and between non-migrant and migrant groups was analysed using a Chi-square test with the posthoc residual analysis of contingency tables (Beasley & Schumacker 1995; Garcia-Perez & Nunez-Anton 2003) to determine the statistical significance of the differences in nutritional status.

The results

The statistical differences in physical status are presented between the Macedonian children living in Macedonia and Slovenia, Albanian children residing in Macedonia and Slovenia, between Macedonian and Albanian children residing in Macedonia, and between Macedonian and Albanian children residing in Slovenia. The mean values of the Slovenian population data are presented only as reference data (Tables 3 and 4).

Table 3: Boys' mean (SD) values of anthropometric measurements

	Country	Group	10 yrs	11 yrs	12 yrs	13 yrs	14 yrs
Stature (cm)	SI	Population	144.5 (6.5)	149.8 (7.1)	156.0 (8.1)	163.3 (8.7)	170.0 (8.2)
		Macedonian	145.3 (6.3)	148.9 (7.8)	155.1 (7.8)	162.7 (8.0)	169.0 (7.0)
		Albanian	142.4 (6.3)	147.8 (7.6)	153.4 (7.5)	162.1 (8.9)	169.5 (8.8)
	MK	Macedonian	144.7 (6.9)	146.3 (7.3)	152.6 (7.6)	162.2 (9.2)	167.3 (7.3)
		Albanian	139.9 (7.8)	142.7 (6.6)	148.9 (7.0)	156.1 (8.9)	164.3 (8.0)
Body mass (kg)	SI	Population	38.9 (8.7)	43.2 (10.2)	48.2 (11.4)	54.3 (11.9)	60.3 (12.0)
		Macedonian	38.9 (8.4)	42.5 (10.3)	47.3 (10.5)	52.3 (11.3)	59.1 (9.3)
		Albanian	35.1 (6.6)	42.3 (11.6)	46.4 (10.1)	53.2 (12.6)	60.0 (14.4)
	MK	Macedonian	41.6 (10.0)	41.1 (8.9)	46.3 (11.0)	53.5 (12.9)	57.0 (11.3)
		Albanian	35.2 (5.5)	36.2 (5.5)	42.9 (8.4)	48.2 (10.1)	56.4 (9.4)
TSF (mm)	SI	Population	12.5 (6.0)	13.0 (6.4)	12.9 (6.5)	12.1 (6.2)	10.9 (5.7)
		Macedonian	12.1 (5.6)	12.4 (5.6)	12.1 (6.1)	11.8 (7.5)	11.5 (7.1)
		Albanian	10.1 (4.7)	12.0 (7.7)	13.7 (7.5)	10.7 (5.4)	10.4 (5.2)
	MK	Macedonian	11.5 (5.8)	10.7 (5.1)	11.0 (6.3)	9.6 (5.6)	9.5 (5.1)
		Albanian	8.2 (2.2)	8.2 (2.4)	10.0 (4.3)	9.1 (3.9)	7.6 (2.6)
BMI (kg/m ²)	SI	Population	18.5 (3.2)	19.1 (3.5)	19.7 (3.6)	20.2 (3.4)	20.8 (3.3)
		Macedonian	18.3 (2.9)	18.9 (3.5)	19.5 (3.3)	19.6 (3.3)	20.7 (2.8)
		Albanian	17.2 (2.4)	19.1 (3.8)	19.6 (3.2)	20.0 (3.4)	20.7 (3.8)
	MK	Macedonian	19.7 (3.3)	19.0 (3.0)	19.7 (3.7)	20.1 (3.6)	20.3 (3.3)
		Albanian	17.9 (1.5)	17.7 (1.7)	19.2 (2.5)	19.6 (2.9)	20.8 (2.7)

Legend: SI – Slovenia, MK – Macedonia

Table 4: Girls' mean (SD) values of anthropometric measurements

	Country	Group	10 yrs	11 yrs	12 yrs	13 yrs	14 yrs
Stature (cm)	SI	Population	144.7 (7.0)	151.0 (7.6)	157.2 (7.1)	161.4 (6.4)	164.0 (6.1)
		Macedonian	144.4 (5.2)	150.3 (7.8)	157.6 (7.7)	161.6 (6.4)	162.0 (5.2)
		Albanian	140.5 (7.5)	148.9 (8.2)	156.6 (7.0)	158.4 (7.3)	162.0 (6.6)
	MK	Macedonian	145.3 (7.5)	149.4 (7.3)	155.2 (7.2)	159.1 (6.9)	159.3 (4.7)
		Albanian	142.7 (6.1)	144.5 (6.9)	151.6 (8.0)	153.6 (5.8)	155.6 (6.4)
Body mass (kg)	SI	Population	38.8 (8.8)	43.3 (9.9)	48.8 (10.4)	52.8 (10.1)	55.6 (9.5)
		Macedonian	40.2 (8.2)	42.9 (10.7)	48.5 (11.6)	52.0 (8.8)	56.0 (9.8)
		Albanian	36.1 (9.7)	40.7 (10.1)	50.7 (11.4)	50.8 (9.7)	55.6 (10.0)
	MK	Macedonian	38.0 (8.7)	42.7 (9.7)	47.1 (9.8)	49.9 (7.3)	52.9 (6.6)
		Albanian	35.9 (6.4)	38.9 (7.2)	43.4 (8.5)	48.0 (5.3)	51.6 (7.0)
TSF (mm)	SI	Population	13.7 (5.6)	13.5 (5.7)	13.4 (5.6)	13.7 (5.6)	13.9 (5.4)
		Macedonian	15.5 (7.6)	12.9 (4.8)	13.6 (5.3)	12.1 (4.0)	14.5 (6.2)
		Albanian	13.2 (6.5)	11.6 (4.1)	14.5 (6.1)	11.9 (4.5)	14.1 (6.8)
	MK	Macedonian	11.0 (4.2)	12.0 (4.8)	12.0 (4.2)	11.7 (3.5)	13.4 (4.1)
		Albanian	9.5 (2.8)	10.6 (3.7)	10.9 (3.6)	12.3 (3.8)	15.0 (6.3)
BMI (kg/m ²)	SI	Population	18.4 (3.2)	18.8 (3.3)	19.6 (3.4)	20.2 (3.3)	20.6 (3.2)
		Macedonian	19.2 (3.3)	18.8 (3.6)	19.4 (3.5)	19.8 (2.5)	21.3 (3.6)
		Albanian	18.1 (3.7)	18.2 (3.9)	20.5 (3.5)	20.2 (3.0)	21.1 (3.3)
	MK	Macedonian	17.8 (2.9)	19.0 (3.1)	19.4 (3.0)	19.6 (2.3)	20.9 (2.5)
		Albanian	17.6 (2.8)	18.5 (2.4)	18.8 (2.5)	20.4 (2.0)	21.3 (2.7)

Legend: SI – Slovenia, MK – Macedonia

Stature

Among the boys, there were no statistically significant differences in stature between Macedonian boys living in Macedonia or Slovenia in any age group, but in Albanian boys, the 11-year-olds residing in Slovenia were significantly ($p = .006$) taller (5.2 cm) than Albanian boys of that age residing in Macedonia. Albanian boys residing in Slovenia were significantly taller than their Albanian peers residing in Macedonia also in 12- and 13-year-olds by 4.5 and 6.0 cm, respectively ($p < .017$). There were no significant differences in stature between 10- and 14-year-old Albanians residing in Macedonia or Slovenia. No differences in stature were observed among 10- and 14-year-old Albanian boys residing in Macedonia or Slovenia.

No differences in stature were observed between Macedonian and Albanian boys residing in Slovenia, but there were significant differences in stature ($p < .029$) between Macedonian and Albanian boys residing in Macedonia in age groups 11, 12 and 13 (3.6, 3.7, and 6.0 cm, respectively). There were no significant differences among 10- and 14-year-olds in this regard.

Among the girls, some statistically significant differences in stature in certain age groups were observed. In Macedonian girls, there was no difference in stature in 10-, 11-, 12-, and 13-year-olds between the ones living in Macedonia or Slovenia; however, among 14-year-olds, Macedonian girls residing in Slovenia were 2.7 cm taller than their peers residing in Macedonia ($p = .046$). The differences among Albanian girls residing in Macedonia or Slovenia were more pronounced and were not expressed solely in the

10-year-old age group. Albanian 11-year-old girls living in Slovenia were 4.4 cm taller, 12-year-olds 4.9 cm, 13-year-olds 4.8 cm, and 14-year-olds 6.4 cm taller than their peers residing in Macedonia ($p < .03$).

A very similar pattern was also observed when comparing differences between Albanian and Macedonian girls living in Macedonia while there were no statistically significant differences in stature in any age group in Slovenia. In the youngest age group of Albanian and Macedonian girls, living in Macedonia, no differences in stature were observed, but in all other age groups, these differences were expressed. Among 11-year-olds residing in Macedonia, the Macedonian girls were 4.9 cm taller than Albanian girls; among 12-year-olds the difference was 3.5 cm, among 13-year-olds 5.6 cm and among 14-year olds 3.6 cm ($p < .008$).

In the Slovenian population, the mean stature of 10- to 14-year-old boys was the highest with 156.6 cm while the shortest stature was observed in Albanian boys living in Macedonia who were 5.1 cm shorter. Among girls, the Slovenian population mean stature of 10- to 14-year-olds was again the highest with 155.7 cm while the shortest stature was observed among Albanian girls living in Macedonia who were 6.1 cm shorter.

Body mass

Among the boys, there were no statistically significant differences in body mass between Macedonian boys residing in Macedonia or Slovenia, neither between Albanian boys residing in Macedonia or Slovenia, except in the group of 11-year-old Albanian boys. The ones residing in Slovenia were 6.1 kg heavier from those in Macedonia ($p = 0.01$).

No differences in body mass were observed between Macedonian and Albanian boys residing in Slovenia, but there were significant differences in body mass between the youngest Macedonian and Albanian boys residing in Macedonia. In the 10-year-old age group, Macedonian boys were significantly heavier (6.4 kg) than Albanian boys residing in Macedonia and the same statistically significant ($p < .021$) pattern was also observed among 11-year-olds (4.9 kg). The differences were not expressed in 12-, 13-, and 14-year-old boys from both ethnic groups.

Among the girls, the differences in body mass were less expressed than those in stature since the between-country comparison showed that only the group of 12-year-old Albanian girls living in Slovenia was significantly heavier (7.2 kg on average) than their Albanian peers residing in Macedonia while there were no differences in other age groups. The intra-country comparison of girls from both ethnic groups showed no difference in body mass between both ethnic groups either within Macedonia or Slovenia.

The Slovenian population mean body mass of 10- to 14-year-old boys was the highest with 49 kg while the lowest mean body mass was observed in Albanian boys residing in Macedonia who weighed 43.8 kg. In girls, the Slovenian population mean body mass of 10- to 14-year-olds was 0.1 kg lower than the highest mean body mass of Macedonian girls residing in Slovenia (47.9 kg), while the lowest mean body mass was expressed in Albanian girls residing in Macedonia (43.6 kg).

Triceps skin fold

Differences between Macedonian boys living in Macedonia and Slovenia were not expressed, but there were significant differences in TSF thickness in the age groups of 11- and 12-year-old Albanian boys residing in Slovenia or Macedonia. In the younger group, the Albanian boys residing in Slovenia had 3.8 mm thicker TSF than the ones living in Macedonia while the difference was 3.6 mm among the 12-year-olds ($p < .048$).

The intra-country comparisons of boys from both ethnic groups showed that there were no statistical differences in TSF thickness among Albanian and Macedonian boys residing in Slovenia, while the differences in TSF thickness between Albanian and Macedonian boys within Macedonia were expressed only in the age group of 11-year-olds. The Albanian boys from that age group had 2.6 mm thicker TSF than Macedonian boys of the same age group residing in Macedonia ($p = .048$).

The inter-country comparison among girls showed that among Macedonian girls residing either in Macedonia or Slovenia significant differences in TSF thickness was expressed only in the 10-year-old age group whereas Macedonian girls residing in Slovenia had 4.5 mm thicker TSF than Macedonian girls residing in Macedonia did ($p = .012$). Among Albanian girls residing in Macedonia or Slovenia, significant differences in TSF were expressed in 10- and 12-year-olds whereas those residing in Slovenia had 3.6 mm thicker TSF in both age groups ($p < .036$).

The intra-country comparisons of differences in TSF thickness between Albanian and Slovenian girls did not reveal any differences in the ethnic groups living either in Slovenia or Macedonia.

The mean TSF thickness in 10 to 14-year-olds among boys was the highest in the Slovenian population with 12.3 mm and the lowest in Albanian boys living in Macedonia with 8.6 mm. Among girls, the Macedonian girls residing in Slovenia had the thickest TSF with 13.7 mm, which was 0.1 mm thicker than the Slovenian population, while the Albanian girls residing in Macedonia had the lowest values with 11.7 mm.

Body mass index

The analysis of differences in BMI showed no significant differences either between Albanian or Macedonian boys and girls living in Macedonia or Slovenia or between both ethnic groups residing in Macedonia or Slovenia.

In comparison with the Slovenian population's mean BMI of 10- to 14-year-old boys (19.7 kg/m^2), we identified the highest BMI values were in Macedonian boys living in Macedonia (19.8 kg/m^2) while the lowest values were found in Albanian boys residing in Macedonia (19.1 kg/m^2). In girls, the highest values of 10- to 14-year-olds BMI were found in Macedonian girls residing in Slovenia (19.7 kg/m^2) and the lowest in Albanian and Macedonian girls residing in Macedonia (19.3 kg/m^2). The Slovenian population's mean BMI of 10- to 14-year-old girls was 19.5 kg/m^2 .

Nutritional status

To study the relation of nutritional status with ethnicity and migration, we used the WOF categories but joined the three underweight categories into one. The children were, thus, categorised into underweight, normal, pre-obese and obese categories by sex and age (Figures 1 and 2).

Among boys living in Macedonia, a significant relation of nutritional status with ethnicity was observed ($X^2(3, N = 679) = 19.38, p < .05$), whereas Albanian boys were less likely to be pre-obese than Macedonian boy and more likely to have normal body mass. Among girls from Macedonia, no significant relation between nutritional status and ethnicity was observed ($X^2(3, N = 650) = 5.35, p > .05$).

Among children living in Slovenia no relation between nutritional status and ethnicity was observed among boys ($X^2(6, N = 55,281) = 3.71, p > .05$) or girls ($X^2(6, N = 52,924) = 6.81, p > .05$).

The relation between migration and nutritional status among children of the same ethnic groups living either in Macedonia or Slovenia proved to be non-significant in Macedonian boys ($X^2(3, N = 687) = 1.37, p > .05$) and girls ($X^2(3, N = 662) = 5.42, p > .05$), while migrant Albanian boys living in Slovenia were significantly less likely to have normal body mass than their peers residing in Macedonia were ($X^2(3, N = 403) = 14.11, p < .05$). At the same time, migrant Albanian girls residing in Slovenia were significantly more likely to be underweight and significantly less likely to have normal body mass than their peers residing in Macedonia ($X^2(3, N = 366) = 17.61, p < .05$).

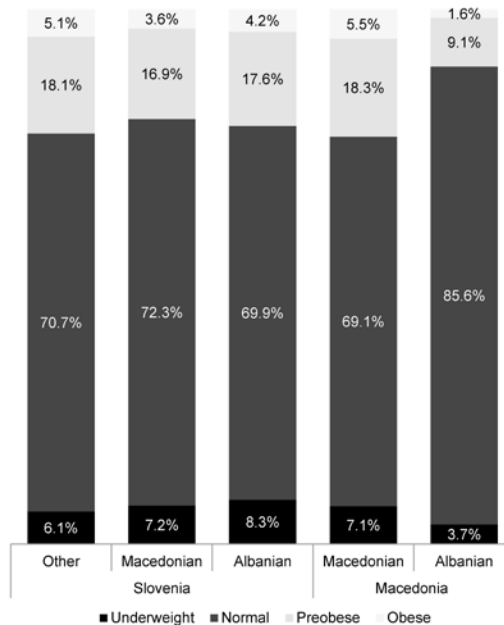


Figure 2: Nutritional status of boys in Slovenia and Macedonia

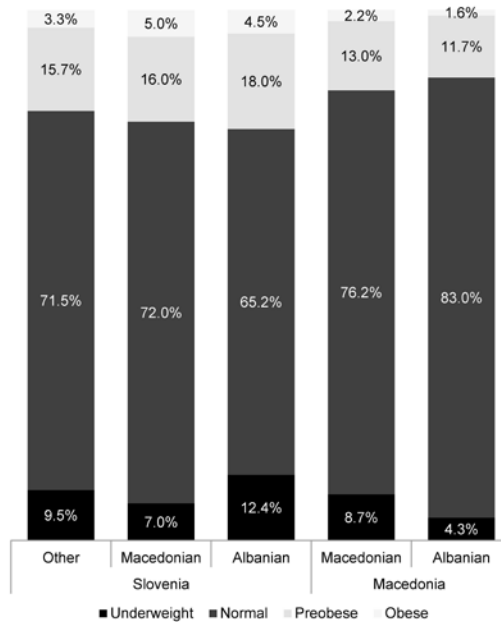


Figure 3: Nutritional status of girls in Slovenia and Macedonia

Discussion and conclusion

Belonging to a migrant or minority group, with its economic, social and environmental consequences, may affect the growth and nutritional status of children belonging to these groups. The analysis of the first round of comparison of growth and nutritional status between Albanian and Macedonian children in Macedonia and Slovenia shows that there are observable differences both in somatic growth and in the nutritional status between both groups that could be linked to the minority or migrant status.

Regarding differences between the Macedonian majority and the Albanian minority children in Macedonia, the situation in the year 2000 suggests that belonging to one or another ethnic group does affect children's development. Albanian minority children were inclined to shorter stature, lower body mass, less subcutaneous fat, lower BMI and tended to have higher odds of normal body mass and lower odds of being pre-obese than their Macedonian majority peers did, especially in boys but the same patterns were observable also in girls. The same pattern was also evidenced by Macedonian researchers who showed that Macedonian girls from Skopje are more likely to be obese than Albanian ones (Krstevska-Konstantinova et al. 2009). It seems that at the turn of the millennium some socio-economic inequalities between the Albanian and Macedonian population in Macedonia did exist and that higher odds of excess weight and faster growth among Macedonian majority children resembled the patterns of less industrialised societies. In those societies, excess weight is predominantly identified among children

from families with higher socio-economic status (Macedonian majority) while children from lower socio-economic status families (Albanian minority) show slower growth patterns and predominantly normal weight (Knai et al. 2012). Similar inequalities related to minority status in Macedonia was also identified by Macedonian researchers (Spiroski et al. 2011) who showed that the Roma minority children in Macedonia, who live in the poorest socio-economic situation, are significantly more inclined to undernutrition.

In contrast, when examining Albanian and Macedonian migrant children in Slovenia, the differences observed between both ethnic groups in Macedonia disappeared. In Slovenia, children from both ethnic groups fell in the same migrant lower socio-economic group.¹ However, since the Slovenian society and especially educational system is egalitarian, uniform and provides equal opportunities for physical activity and healthy nutrition (Gregorič et al. 2015; Sember et al. 2016), children from both migrant ethnic groups became more similar to the Slovenian population than to their peers from the same ethnic groups in Macedonia. This was especially expressed in migrant Albanian girls in Slovenia who showed positive growth trends and were significantly taller than their Albanian minority peers from Macedonia but, at the same time, their odds of having normal body mass decreased while their odds of being underweight increased. The decreased odds of having normal body mass was also observable in migrant Albanian boys in Slovenia. Since in the Slovenian population higher rates of obesity are linked to lower socio-economic position it is not surprising that among migrant Albanian children in Slovenia the prevalence of obesity was more than double in comparison to the minority Albanian children in Macedonia while the rates of pre-obesity were also higher by more than 60%.

The results of the 2000/2001 comparison suggest that in regard to growth and nutritional status, migration to Slovenia does not put Albanian and Macedonian migrant children at greater health risks than the rest of the population of children in Slovenia, but the differences might be more expressed in the levels of physical fitness, which will be analysed in the future. Moreover, the next comparison, planned for 2020/2021, might reveal a very different picture with the improvement of minority status of the Albanian population in Macedonia in the previous decade and with the economic crisis which might be reflected in the growth and nutrition of socio-economically more vulnerable Albanian and Macedonian migrant groups in Slovenia.

However, in Slovenia, the overall childhood pre-obesity and obesity rates were rising until 2010, as observed by the SLOfit system and by the ACDSi study (Jurak, Kovač & Starc 2013; Starc et al. 2015); this suggests that the migrant populations of children in Slovenia might have been experiencing an even greater growth of pre-obesity and obesity during this period. Surprisingly, in 2001, the pre-obesity and obesity rates of Albanian and Macedonian boys from migrant families in Slovenia were even lower than the Slovenian population rates while the differences in girls were also very small. This is somewhat different from the findings which suggest that the children from ex-

¹ According to Komac (2003), while only around one third of Slovenian males in Slovenia are manual workers, 55% of Albanian males and 52% of Macedonian males in Slovenia are manual workers, belonging to the low socio-economic class.

Yugoslavian migrant families have some of the highest rates of obesity, as is the case in the Netherlands (Kirchengast & Schober 2006). In contrast, Macedonian and Albanian children living in Macedonia show similar differences from that population of children in Slovenia in pre-obesity and obesity as Serbian children also show lower prevalences of pre-obesity and obesity than children from Slovenia do (Jurak et al. 2015). In the future follow-ups, it will be possible to observe how economic development and consumerism affected the growth patterns and obesity trends in Macedonia, which would be a good indicator of possible future trends in developing countries and countries undergoing socio-political and economic transformations.

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Povzetek

V prispevku predstavljamo prve ugotovitve raziskovalnega sodelovanja med slovenskimi in makedonskimi raziskovalci, ki proučujejo okoljske vplive na rast in razvoj otrok. Študija vključuje 5 različnih skupin otrok: makedonske večinske otroke, ki živijo v Makedoniji, albanske manjšinske otroke, ki živijo v Makedoniji, makedonske in albanske otroke iz priseljenjskih družin, ki živijo v Sloveniji ter populacijo ostalih otrok ki živijo v Sloveniji. Predstavljeni so izsledki prvega kroga meritev, organiziranega v šolskem letu 2000/2001. Ugotovitve kažejo, da so bile razlike v višini, telesne mase, debelini kožne gube nadlahti in indeksa telesne mase med makedonskimi in albanskimi otroki, ki živijo v Makedoniji, večji od razlik med otroki obeh migrantskih etničnih skupin, ki živijo v Sloveniji. Makedonski otroci, ki živijo v Makedoniji, so kazali večjo nagnjenost k preddebelosti in debelosti kot njihovi albanski vrstniki. Med migrantskimi albanskimi in makedonskimi otroki v Sloveniji razlik skoraj ni, čeprav pa podatki kažejo, da je pojavnost debelosti migrantskih otrocih v Sloveniji višja kot pri albanskih in makedonskih otrocih, ki živijo v Makedoniji. Razlike v višini, telesni masi, kožni gubi nadlahti in ITM med skupinama migrantskih otrok in populacijo otrok v Sloveniji, so bile zelo majhne bistvenih razlik pa ni bilo niti deležu preddebelih in debelih otrok.

KLJUČNE BESEDE: debelost, rast, otroci, migranti, etnične manjšine, Slovenija, Makedonija

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