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Overweight and abdominal obesity in women of childbearing age of Russian, Somali and Kurdish origin and the general Finnish population

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Abstract

Background: Migrant background and higher parity may increase the risk of being overweight. We compared the prevalence of overweight (body mass index≥25 kg/m²) and abdominal obesity (waist-to-height ratio≥0.5) between non-pregnant migrant and Finnish women aged 18–45 years.

Methods: The participants were 165 Russian, 164 Somali and 179 Kurdish origin women from the cross-sectional Migrant Health and Wellbeing study. The reference group included 388 women from the general Finnish population. Body anthropometrics were measured. The main statistical methods were logistic regression adjusted for sociodemographic and reproductive variables.

Results: The unadjusted prevalence of overweight and obesity, respectively, were higher among Somali (32.9%, 30.9%, p<0.001) and Kurdish women (41.1%, 19.5%, p<0.001) than among Finnish women (19.9%, 9.8%). The adjusted odds ratios (95% confidence interval) for overweight (including obesity) were 0.54 (0.33; 0.89) for Russian, 2.89 (1.66; 5.03) for Somali and 2.56 (1.64; 4.00) for Kurdish women compared with Finnish women. Kurdish women had 2.96-fold (1.75; 5.00) adjusted odds ratio for abdominal obesity compared with Finnish women. Being parous was associated with overweight and abdominal obesity among Kurdish women.

Conclusions: Overweight and obesity were very common among Somali and Kurdish origin women. Information on diet and physical activity in these groups is needed.

Keywords: overweight, waist circumference, women, childbearing age, migrant

Background

The global number of international migrants has increased by half since 1990, reaching 232 million in 2013[1]. In general, migrants from low-income countries have poorer health than the majority population in high-income countries[2]. For example, prevalence of obesity, cardiovascular diseases and type 2 diabetes are higher among some migrant groups than among the majority population in the new country[3-11] or in their country of origin[12,13]. These differences seem to be partly explained by lower sociodemographic status[9], unhealthier diet[14-16] or more sedentary lifestyle[4] among migrants compared with the majority population, although not in all studies[7,17]. Migrants often adopt unhealthy lifestyle when adapting to a new obesogenic environment[18]. Some studies show that women are more vulnerable to weight gain and diabetes after migration than men[7,12].

The contribution of childbearing and other reproductive factors to the observed differences in the prevalence of overweight and obesity between migrants and the majority population have been studied much less. A Dutch study reported a higher age-adjusted prevalence of overweight among first-generation migrant Turkish and Moroccan women than among Dutch women aged 15–30 years[4]. Parity was not associated with the prevalence of overweight among 35–74 year-old Turkish and Moroccan migrants living in the Netherlands[17]. In Norway, women of Eastern European and Middle Eastern origin gained more weight during pregnancy[19] and women of South Asian, Middle Eastern and African origin retained more weight postpartum[20] compared with Western European women. In general, postpartum weight retention and higher parity slightly increase the risk for overweight among women both in high-, middle- and low-income countries[21,22]. Few European studies have reported waist circumference in different groups of migrant women and the findings are mixed[23,24]. Prevention of obesity among women of childbearing age is important since obesity increases the risk for several pregnancy complications and adverse maternal and foetal outcomes[25].

While the proportion of migrants in Finland is still relatively low (5% of the total population)[26], this number is expected to double by 2025[27]. There is evidence for significant differences in cardiovascular risk factors among migrants of Russian, Somali and Kurdish origin and aged 30–64 years compared with the general population, especially among women[28]. For example, higher mean body mass index (BMI) and fasting glucose, but lower mean systolic and diastolic blood pressure were observed among Somali and Kurdish women[28]. A more detailed, confounder-adjusted analysis on the differences in the prevalence of overweight and high waist circumference between these main migrant groups and the general Finnish population is warranted.

The aim of the present study was to compare the prevalence of overweight (BMI ≥25.0 kg/m²) and abdominal obesity (waist-to-height ratio ≥0.5) between non-pregnant women of childbearing age (18–45 years) of Russian, Somali and Kurdish origin and the general population in Finland, when adjusting for sociodemographic and reproductive characteristics. We also examined the association between parity and overweight or abdominal obesity within each group.

Materials and methods

Participants

The present study was a secondary analysis of existing data from the cross-sectional Migrant Health and Wellbeing (Maamu) study[29]. The Maamu study was conducted in six municipalities (Helsinki, Espoo, Vantaa, Turku, Tampere and Vaasa) in Finland between 2010 and 2012. A random sample of 18–64 year-old migrants of Russian, Somali and Kurdish origin (n=1000 in each group) was drawn from the National Population Register. A person was defined as being of Russian origin if (s)he was born in Russia or the Soviet Union and had Russian or Finnish as their mother tongue, of Somali origin if born in Somalia and of Kurdish origin if born in Iraq or Iran and had Kurdish as their mother tongue. An additional selection criteria was residence in Finland for at least one year.

Recruitment of participants, interviews and health examinations were carried out by trained bilingual interviewers and nurses.

The reference population consisted of women from the general Finnish population (later referred to as Finnish) who participated in the Health 2011 Survey, a comprehensive national health examination survey on health, functional capacity and welfare of the population, in the same six municipalities where the Maamu study was conducted[30,31]. For the present study, women of childbearing age (18–45 years) in the Maamu sample (n=1158) and the reference population (n=722) were included (Supplementary figure 1). Participation rates varied by group, being lowest for Somali women. Women with measured data on weight and height were included. Seven Russian, eight Somali, nine Kurdish and four Finnish women who were known to be pregnant at the time of the data collection were excluded from the study. Finally, 165 Russian, 164 Somali, 179 Kurdish and 388 women from the general population were included in the analyses.

The National Institute for Health and Welfare obtained ethical approval for both studies from the Coordinating Ethics Committee of the Helsinki and Uusimaa Hospital District. All participants signed informed consent.

Data collection and variables

In both studies, height was measured without shoes with a stand-alone stadiometer (Seca 213). Weight was measured wearing light clothing with no shoes. In the Maamu study, a balanced beam scale (Seca 709) was used. In the Health 2011 Survey, weight was measured as a part of the bioimpedance body composition analysis (Seca 514). However, only part of the Health 2011 Survey participants aged ≤28 years were invited to the health examinations and therefore measured values are available for 16.7% (n=29). For the remaining 83.3% (n=145) of the Health 2011 participants aged ≤28 years, self-reported data were used. BMI was calculated as weight (kg) divided by squared height (m^2) and was categorised as underweight (≤18.5 kg/m^2), normal weight (18.5–24.9 kg/m^2), overweight (25.0–29.9 kg/m^2) and obesity (≥30.0 kg/m^2).

In both studies, waist circumference was measured using a soft measuring tape half-way between the lowest rib and the top of iliac crest on bare skin or wearing light clothing. Abdominal obesity was defined as waist-to-height ratio ≥0.5, which is a better global screening tool for cardiometabolic risk than waist circumference alone[32,33] and corresponds quite well to BMI≥25 kg/m²[34]. Information on waist circumference was not available for the Health 2011 Survey participants aged ≤28 years.

Data on the following sociodemographic and reproductive characteristics were collected during the interview (or in the self-administered questionnaires for the younger Finnish women): Age, marital status, basic education, employment status and the numbers of previous deliveries (parity), miscarriages and induced abortions. The categorisations of the variables are described in Table 1. Data on the reason for the residence permit (asylum seeker or refugee/family reunification/work related/remigration/other), time lived in Finland (years) and ability to speak Finnish/Swedish (not at all/poorly/moderately/well) were collected for migrants only.

Statistical analyses

Data were analysed using Stata software (StataCorp. 2013. *Stata Statistical Software: Release 13.* College Station, TX: StataCorp LP). Finite population correction and stratification as well as inverse probability weights, based on register information (age group, sex, migrant group, study location, and marital status), were used to correct for the effects of non-response and different sampling probabilities in all analyses[29,35-37]. Descriptive data were reported as numbers of observations (prevalence %) or means (unweighted sd). Chi square test was used to compare unadjusted prevalences and Wald's test to compare means between each migrant group and the reference group.

Logistic regression analyses were used to assess differences in the outcome variables between each migrant group and the reference group. BMI was re-categorised to not-overweight

(<25 kg/m²) and overweight (≥25 kg/m²). In each model, all variables were simultaneously added into the model. Model 1 was adjusted for age (continuous) only. Model 2 was adjusted for age, marital status (married/registered partnership/cohabiting vs. other), basic education (high school vs. other) and employment status (working vs. other). Model 3 was additionally adjusted for parity (0, vs. ≥1) and the numbers of previous miscarriages (0 vs. ≥1) and induced abortions (0 vs. ≥1). These variables were included as potential confounders because they were associated with migrant group in the present study, they were likely to be related to the outcome variables based on previous knowledge and the data were available both for the migrants and the reference group. Additionally, the interaction term study group*parity (0 vs. ≥1) was included in Model 3. Due to significant study group*parity interactions (p=0.006 for Somali, p<0.001 for Kurdish), the associations between parity and risk for overweight or abdominal obesity were estimated separately within each study group using logistic regression adjusted for the same sociodemographic factors.

Results

Sociodemographic and reproductive characteristics

One third of Russian women were returnees (had Finnish ancestry or were Ingrian Finns). Most Somali and Kurdish women had arrived to Finland as asylum seekers, refugees or for family reunification. In total, 72.0% of Russian, 75.9% of Somali and 78.4% of Kurdish women had lived in Finland for more than 6 years. Additionally, 54.5% of Russian, 36.9% of Somali and 48.4% of Kurdish women spoke Finnish or Swedish well. A higher percentage of Somali and Finnish women belonged to the youngest age group compared with Russian and Kurdish women (Table 1). Approximately two thirds of the women in each group were married. A lower percentage of Somali and Kurdish women had attended high school or were working compared with Finnish and Russian women. Parity was highest among Somali women. A higher percentage of Somali and Kurdish

women had had miscarriages compared to Finnish and Russian women. Russian women were most likely to have had at least one induced abortion, whereas Somali women were least likely.

Unadjusted prevalence of overweight, obesity and abdominal obesity

Almost two-thirds of Kurdish and Somali women were overweight or obese, whereas less than one-third of Finnish and Russian women (Table 2). The mean BMI was higher among Somali and Kurdish women compared with Finnish women. Prevalence of abdominal obesity was higher among Somali and Kurdish women than among Finnish women.

Logistic regression models for overweight and abdominal obesity

Table 3 shows associations between study groups and overweight in an age-adjusted model and when adjusting for other sociodemographic characteristics (Model 2) and additionally for some reproductive characteristics (Model 3). In Models 2 and 3, the adjusted odds for overweight were 0.5 to 0.6-fold for Russian women, 2.9 to 3.1-fold for Somali and 2.6 to 2.7-fold for Kurdish women compared with Finnish women. Kurdish women had 2.8 to 3.0-fold odds for abdominal obesity in Models 2 and 3 compared with Finnish women.

Parity and the risk of overweight and abdominal obesity

Table 4 shows the risk of overweight and abdominal obesity by parity within each study group. After adjusting for age, marital status, basic education and employment status, having children was significantly associated with higher risk of overweight and abdominal obesity among Kurdish women only. Among them, the odds for overweight were 2.6-fold in parous women and the odds for abdominal obesity were 3.6-fold in parous women compared with nulliparous women. Having at least one previous miscarriage or abortion were not significantly associated with overweight or abdominal obesity in the fully adjusted models (results not shown).

Discussion

Main findings of this study

Almost two-thirds of Kurdish and Somali women of childbearing age were overweight or obese, whereas less than one-third of women in the Finnish general population. These differences persisted after adjusting for sociodemographic and reproductive factors. On the other hand, Russian women had lower odds for overweight compared with Finnish women, when adjusted for confounders. The prevalence of abdominal obesity was also higher among Kurdish and Somali women than among Finnish women, but only Kurdish women differed significantly from Finnish women when adjusted for confounders. Being parous was related to higher adjusted odds for overweight and abdominal obesity among Kurdish women only.

What is already known on this topic?

Hosper et al. compared 129 Turkish and 73 Moroccan 15–30 year-old first-generation migrant women living in Amsterdam with a national sample of Dutch women of the same age[4]. While data on body anthropometrics were measured in migrant women, Dutch women provided self-reported data which may have caused some underestimation of body weight among them. The age-adjusted prevalence of overweight was 39% among both migrant groups and 19% among Dutch women. These results are in accordance with our findings, although in different populations. The prevalence of overweight was lower, possibly due to having a younger population than in our study.

Some other studies have reported the prevalence of overweight among various groups of migrant women aged 25–75 years[23,24,38-40]. Based on convenience samples from the USA[39] and Norway[40], two thirds of Somali women were overweight. Another Norwegian study found higher age-adjusted prevalence of obesity among several groups of migrant women, including Iranian, than among Norwegian women, but no difference in the prevalence of abdominal obesity between

Iranian and Norwegian women[24]. In Swedish studies, the mean BMI and waist circumference did not differ significantly between Iranian migrant women and ethnic Swedish women[23], but higher age-adjusted mean waist circumference was observed in Iraqi women compared with Swedish women[38]. A recent paper based on the same Maamu study, reported higher age-adjusted prevalence of obesity measured with BMI (≥30 kg/m^2) and waist circumference (≥88 cm) among 30 to 64 year-old Somali and Kurdish migrant women compared with Finnish women[28]. The prevalence of overweight in migrants could also be compared with respective data from their country of origin, if available. We did not find such data for women in reproductive age. However, among all women including also older age groups, the previously reported age-standardised prevalence of overweight (including obesity) were higher in Russia (55-59%), almost the same in Iraq and Iran (63-68%) and much lower in Somalia (25-29%) than in our study[41,42].

In our study, being parous was associated with higher confounder-adjusted odds for overweight and abdominal obesity significantly among Kurdish women only. A similar, but non-significant tendency was observed among the smaller group of Somali women. Somali women, regardless of parity, may have had higher BMI already since adolescence. Among children of participants of the original Maamu sample, one third of 13–16 year-old girls of Somali origin were overweight or obese[43]. The US study including a convenience sample of Somali refugee women found that limited access to healthy and acceptable food was a risk factor for overweight, but parity (≤4 vs. ≥5 children) was not[39]. In a Dutch study, parity was not associated with overweight among older Turkish and Moroccan women, although the null finding might partly be due to comparing ever pregnant to never pregnant women (4-7% of the participants) and using self-reported anthropometric data[17]. A large study from 33 low and middle income countries reported that women with at least two children had 1.2 to 1.5-fold odds for overweight compared with women with one child in most areas except for South and South East Asia[22].

What this study adds?

To our knowledge, this is the second European study to report differences in the prevalence of overweight among any group of migrant women of childbearing age compared with the general population. The present study is also the first to compare waist-to-height ratio between migrant women and general population. Waist-to-height ratio indicates cardiometabolic risk better than waist circumference alone[32,33,44] and the commonly used cut-offs for high waist circumference may not apply to all ethnic groups since body height, the percentage and distribution of body fat and the related health risks vary by ethnicity.[45,46]

The main strengths of this study include population-based sampling of migrants of Russian, Somali and Kurdish origin. Reference data were also available for the general Finnish population belonging to the same age group. Additionally, trained fieldwork personnel collected the data using a standardised study protocol and in the mother tongues of the participants. Anthropometric data were based on measurements, except for Finnish women belonging to the youngest age group.

Limitations of this study

Some methodological limitations should be considered when interpreting the findings. The participation rate varied between the groups from 37.5% among Somali women to 53.7% among Finnish women, being comparable with those in respective studies among migrant populations[4,24]. To reduce the risk of selection bias, inverse probability weighting was used to correct for the effects of non-response in our study[35,36]. The numbers of women were relatively low which did not allow us to examine obesity (BMI≥30.0 kg/m²) as a separate outcome or multiparous women as a separate category. The confidence intervals were wide in Table 4 and the results should be confirmed in larger studies.

The use of self-reported data on body weight and height for 83.3% of under 29 year-old (37.4% of all) Finnish women may have limited comparability between the groups. Since the reason for using self-reported data did not depend on women themselves, the risk for information

bias should be lower. However, it is possible that the self-reported data for younger Finnish women are underestimates (mean measured BMI 24.0kg/m² vs. self-reported BMI 23.2 kg/m², p=0.41, t-test) and the differences between the groups might therefore have been slightly overestimated. Another limitation is lack of data on waist circumference for most Finnish women younger than 29 years. Waist circumference was measured on bare skin for Russian and Finnish women, but with light clothing for most Somali and Kurdish women. The measurements for Somali and Kurdish women might therefore be slightly overestimated. Our results are not generalizable to all other migrant populations.

Conclusions

Somali and Kurdish origin women of childbearing age have a higher prevalence of overweight and Kurdish women also have higher a prevalence of abdominal obesity than the respective women in the general Finnish population, even when adjusted for sociodemographic and reproductive factors. Prospective studies with detailed measurements on dietary intake and physical activity are needed to identify behavioural risk factors for development of overweight before planning intervention studies or programmes for prevention of overweight among migrants in Finland.

As obesity is a risk factor for several pregnancy complications[25] and many migrant women, at least women of Somali or Kurdish origin, have several pregnancies, prevention of overweight and obesity is important among them. The Finnish maternity and child health care, which almost every pregnant woman in Finland, including those with foreign origin and many children, attend during each pregnancy and with each child, would be one relevant setting for such studies and health promotion interventions.

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Conflicts of interest

None declared.

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Figure legends

Supplementary figure 1. Flow chart of the study participants

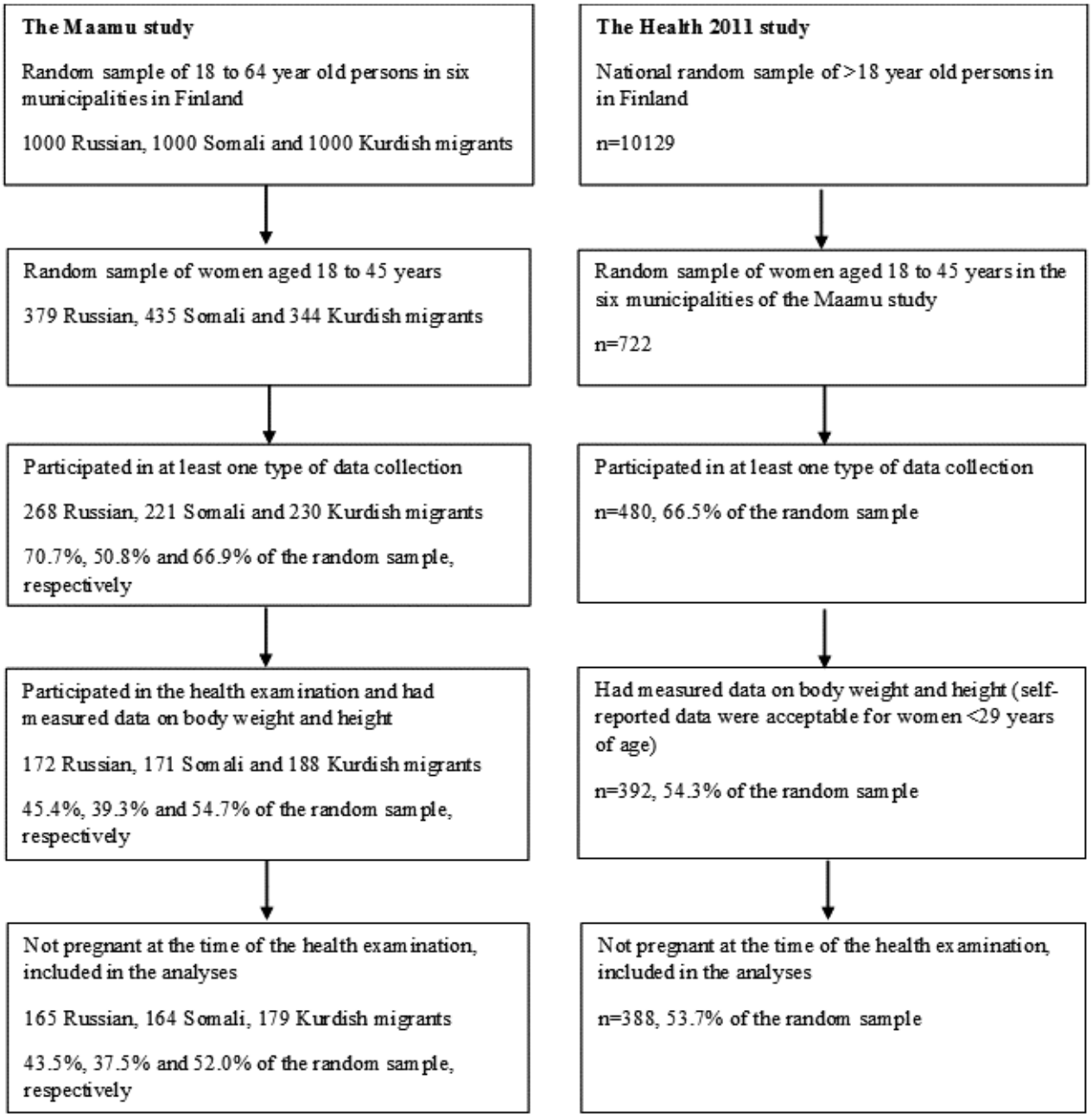

Table 1. Sociodemographic and reproductive characteristics by ethnicity (crude n and weighted percentages, %)

	Finnish (n=385-388)[a]	Russian (n=163-165)[a]	Somali (n=154-164)[a]	Kurdish (n=174-179)[a]
Sociodemographic characteristics				
Age, %				
18-24 y	33.6	21.5	29.5	19.3
25-34 y	40.7	41.0	34.1	40.9
35-45 y	25.8	37.5	36.4	39.8
Marital status, %				
Married, registered partnership or cohabiting	57.6	61.6	69.2	66.3
Other	42.5	38.4	30.8	33.7
Basic education, %				
No formal education	0.0	0.0	24.8	13.2
Elementary school[b]	19.6	17.7	55.6	42.4
High school[b]	80.4	82.3	19.6	44.3
Employment status, %				
Working full time or part time	60.1	43.4	17.0	29.2
Student	26.6	26.9	27.8	28.0
Looking after the household	7.9	11.4	39.4	17.1
Unemployed or laid off	1.2	17.8	14.6	23.4
Retired or other	4.1	0.6	1.2	2.3

Reproductive characteristics				
Parity, %				
0	73.4	45.9	23.5	24.2
1	9.6	26.3	5.9	18.3
2	11.1	20.9	14.7	23.3
3	4.9	6.5	11.3	17.3
4 or more	1.0	0.4	44.6	16.9
At least one previous miscarriage, %	10.2	12.9	26.8	24.4
At least one induced abortion, %	10.3	37.5	1.0	20.0

[a] For the reproductive characteristics, the numbers were 353-354 for Finnish, 156-157 for Russian, 117-126 for Somali and 164-169 for Kurdish women.

[b] Or respective or a part of it

Table 2. Anthropometric measurements by study groups, unadjusted weighted means (unweighted sd) or percentages (%)

	Finnish (n=385-388)[a]	Russian (n=165)	p-value [b]	Somali (n=164)	p-value [b]	Kurdish (n=175-179)	p-value [b]
Height, cm	166.3 (6.3)	166.3 (6.2)	0.93	162.6 (5.9)	**<0.001**	158.9 (5.0)	**<0.001**
Weight, kg	66.5 (15.2)	64.9 (14.6)	0.25	72.6 (16.3)	**<0.001**	66.5 (11.3)	0.83
BMI, kg/m²	24.0 (5.1)	23.5 (5.1)	0.28	27.5 (5.9)	**<0.001**	26.3 (4.5)	**<0.001**
BMI group, %							
Underweight, BMI<18.5	3.2	4.8	0.76	2.6	**<0.001**	1.5	**<0.001**
Normal weight, BMI 18.5-24.9	67.1	68.6		33.6		38.0	
Overweight, BMI 25.0-29.9	19.9	18.5		32.9		41.1	
Obese, BMI ≥30.0	9.8	8.0		30.9		19.5	
Waist circumference, cm	79.2 (11.9)	76.4 (12.0)	0.07	79.5 (12.8)	0.82	81.7 (11.5)	0.08
Waist-to-height ratio	0.48 (0.07)	0.46 (0.07)	0.06	0.49 (0.08)	0.21	0.52 (0.08)	**<0.001**
Abdominal obesity (waist-to-height ratio ≥0.5)	26.7	23.3	0.57	44.3	**0.009**	57.4	**<0.001**

[a] Among Finnish women, n=240 for variables related waist circumference as the information was not available for participants aged ≤28 years.

[b] Chi square test for prevalences, Wald's test for means, as compared with the Finnish reference group. Statistically significant p-values ($p \leq 0.05$) are marked with bold.

Table 3. Logistic regression models for overweight (BMI≥25 kg/m²) and abdominal obesity (waist-to-height ratio ≥0.5)

	Model 1[a]		Model 2[a]		Model 3[a]	
	OR (95% CI)	p	OR (95% CI)	p	OR (95% CI)	p
Overweight	n=889		n=864		n=777	
Finnish	Reference		Reference		Reference	
Russian	0.68 (0.44 to 1.07)	0.10	0.62 (0.39 to 0.99)	**0.045**	0.54 (0.33 to 0.89)	**0.016**
Somali	4.24 (2.80 to 6.44)	**<0.001**	3.12 (1.90 to 5.13)	**<0.001**	2.89 (1.66 to 5.03)	**<0.001**
Kurdish	3.32 (2.29 to 4.80)	**<0.001**	2.67 (1.77 to 4.02)	**<0.001**	2.56 (1.64 to 4.00)	**<0.001**
Abdominal obesity	n=747		n=723		n=639	
Finnish	Reference		Reference		Reference	
Russian	0.67 (0.37 to 1.22)	0.19	0.64 (0.35 to 1.17)	0.14	0.63 (0.36 to 1.12)	0.11
Somali	2.00 (1.09 to 3.68)	**0.026**	1.63 (0.87 to 3.06)	0.13	1.64 (0.85 to 3.16)	0.14
Kurdish	3.19 (1.77 to 5.75)	**<0.001**	2.77 (1.56 to 4.90)	**<0.001**	2.96 (1.75 to 5.00)	**<0.001**

[a] Model 1 was adjusted for age (continuous). Model 2 was adjusted for age (continuous), marital status, basic educational level and employment status (all categorical). Model 3 was additionally adjusted for parity and the numbers of previous miscarriages and induced abortions (all categorical). Inverse probability weights were used in the analyses. Statistically significant p-values (p≤0.05) are marked with bold.

Table 4. Association between parity and overweight (BMI≥25 kg/m²) or abdominal obesity (waist-to-height ratio ≥0.5) within each group

	n (Finnish, Russian, Somali, Kurdish)	Finnish OR (95% CI)	p	Russian OR (95% CI)	p	Somali OR (95% CI)	p	Kurdish OR (95% CI)	p
Overweight, age-adjusted									
Parity	353, 157, 126, 165								
0		Reference		Reference		Reference		Reference	
≥1		0.93 (0.46; 1.88)	0.84	1.15 (0.40; 3.29)	0.79	2.07 (0.80; 5.35)	0.13	4.77 (2.03; 11.18)	**<0.001**
Overweight, adjusted [a]									
Parity	352, 157, 122, 162								
0		Reference		Reference		Reference		Reference	
≥1		0.85 (0.40; 1.80)	0.67	1.23 (0.45; 3.52)	0.67	1.84 (0.62; 5.48)	0.27	2.62 (1.04; 6.58)	**0.040**

Abdominal obesity, age-adjusted									
Parity	209, 157, 126, 168								
0		Reference		Reference		Reference		Reference	
≥1		0.90 (0.40; 2.04)	0.81	1.26 (0.42; 3.81)	0.68	2.01 (0.70; 5.73)	0.19	5.10 (2.18; 11.94)	**<0.001**
Abdominal obesity, adjusted [a]									
Parity	209, 157, 122, 167								
0		Reference		Reference		Reference		Reference	
≥1		0.85 (0.28; 2.53)	0.77	1.26 (0.43; 3.72)	0.68	2.44 (0.76; 7.80)	0.13	3.60 (1.44; 9.00)	**0.006**

[a] Adjusted for age, marital status, basic education and employment status. Inverse probability weights were used in the analyses. Statistically significant p-values ($p \leq 0.05$) are marked with bold.