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ORIGINAL ARTICLE

Approach to prevention of obesity of Roma population in the Region of South Bohemia with focus on selected eating behaviors

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Abstract

OBJECTIVES: To survey obesity prevention methods for use in the Roma population with a focus on eating behaviors.

METHODS: A semi-structured interview was used to identify potentially useful obesity prevention methods. Basic anthropometric measurements were also gathered at the same time.

This study was part of the "Obesity and overweight in the Roma minority in the Region of South Bohemia" research project (grant project 280-COST-LD14114). Participants consisted of members of the Roma minority (302 respondents) as well as the majority (Czech) population for comparisons.

RESULTS: Differences in eating behaviors like irregular eating schedules and excessive consumption of fast food were observed. Statistically significant differences between the Roma minority and the majority (Czech/non-Roma) population were found in this area with the help of statistical significance tests. The Chi-square characteristic of independence (χ^2) was, in case of this distribution, valued at 30.815 with 5 degrees of freedom, $p<0.001$. The analyses, based on the second degree of classification, identified statistically significant differences between the Roma minority and the majority population. Members of the Roma minority attended preventive health check-ups statistically less often than members of the majority population. Differences between the majority and the Roma population were also found in the degree of patient cooperation with general practitioners.

CONCLUSION: The results show that the Roma population is more likely to engage in eating behaviors that can contribute to overweight and obesity than the majority population. Based on the results of a semi-structured interview and on the results of anthropometric measurements, we can say that the Roma population is at a greater health risk, relative to overweight and obesity, than the majority population.

INTRODUCTION

The *Report on the Health of the Inhabitants of the Czech Republic* (Kodl 2014) points out that social economic determinants, environmental conditions, and lifestyle adaptations, with its associated consequences, significantly impact on the overall health of the Roma population. At the same time, the *Report* highlights the need for specific health interventions to address these issues. Šteflová (2004) pointed to the need for prevention, while also gaining a better understanding of individual health determinants. Expert publications state that lifestyle has the greatest overall influence (50–60%) on health. Studies (Šedová *et al.* 2015) have shown that the Roma population suffers from overweight and obesity much more often than the majority (Czech) population. One of the causes is the poor nutritional quality of foods consumed (Olišarová *et al.* 2016).

Eating behaviors represent a set of complex relationships between physiologic, psychological, social and genetic factors, which combine to influence meal timing/scheduling/frequency, quantity of food consumed, and food selection (Grimm and Steinle 2011). Hlúbik (1994) states that the frequency of food intake is one of the basic conditions for proper nutrition and weight control; e.g., if a person eats only once a day, they may experience the so-called lipo-energy effect of insulin, which leads to fat deposition in fat cells. The result is gradual weight gain that, over time, can lead to overweight or obesity. Nutritional education, which includes eating habits, is an important, efficient preventive step that directly affects individuals but can also affect the individual's family or community.

MATERIALS AND METHODS

The data were collected using semi-structured interviews focused on gathering information on attitudes in the Roma and majority (Czech) population regarding prevention of overweight and obesity. Depending on the data source, the Roma population forms from 0.12%–2.8% of the Czech population, which the group a very small minority. From this point on the Roma population with be referred to as "Roma" or the "Roma population" while the non-Roma/Czech respondents, who were used for comparisons, will be referred to as the "majority population" or the "majority".

The interview investigated eating behaviors in two ways: (1) through a 24-hour dietary recall and (2) through a frequency analysis of selected foodstuffs. A trained interviewer filling out the recalled diet together with each respondent served as a validation step in the (dietary recall) technique. Other interview areas included a survey of daily physical activity.

Psychosocial factors were surveyed using a standardized questionnaire for assessment of depression (according to Zung). Other questions on the interview concerned the respondents' attitudes toward health care and to their perception of their ability to influence their own weight (self-management). The research methods used and the evaluation of the collected data was done in consultation with the Centre of Preventive Cardiology of the Institute of Clinical and Experimental Medicine (IKEM), Prague, CZ.

The sample consisted of 600 respondents, 302 Roma and 298 from the majority population. Since the basic goal of the study was to compare overweight and obesity in Roma population in the South Bohemia Region of the CZ, with the majority population, the sample size was structured to include adequate numbers from both the Roma and the majority population. Ultimately the ratio of respondents was about 50:50, i.e., Roma (50.3%) and the majority population (49.7%). The Roma participants, in South Bohemia were selected using the so-called "snowball sampling" method. Its gender structure was derived from the general population, since it is assumed that the male to female ratio is about 50:50 in both populations. Therefore, gender can be considered representative. The majority population, with its much, much larger pool of potential respondents was subject to quota selection, where gender was specified as part of the quota, in an effort to have equal numbers of men and women.

The basic statistical data processing was performed using the SASD program, version 1.4.10. (Statistical Analysis of Social Data). The statistical associations between the observed features were tested according to the character of the observed features. Chi-quadrate test of good fit – Pearson Chi-Square (χ^2) was used as the standard test; the testing was carried out for significance levels: $\alpha<0.05$, $\alpha<0.001$, and $\alpha<0.001$ (test of independence).

RESULTS

To understand some of the associations, the first part of the results shows the distribution of men and women in the two groups of participants, which were without significant statistical differences (Table 1).

While gender differences were insignificant, group structure between the Roma and majority population showed statistically significant differences with respect to age distribution. The Roma had significantly more respondents from the youngest age group (18–29), while respondents from the majority formed a bimodal distribution (30–39; and ≥70), which made the groups statistically significantly different relative to age (Table 2).

Prevention in health care is as a very broad concept that incorporates many factors, methods, and approaches to disease prevention. Prevention focused on nutrition and eating behaviors is perhaps, more straightforward than many approaches. It can be easily monitored through regular preventive check-ups by a general practitioner; although, results show that while it may be easy in theory, it is less easy in practice. Our

Tab. 1. Group structure by gender.

Group	Roma		Majority population		Total	
	N	%	N	%	N	%
Men	152	50.3	148	49.7	300	50.0
Women	150	49.7	150	50.3	300	50.0
TOTAL	302	100.0	298	100.0	600	100.0

Tab. 2. Group structure by age.

Group	Roma		Majority population		Total	
	N	%	N	%	N	%
18–29 years	132	43.8	84	28.2	216	36.1
30–39 years	49	16.3	78	26.2	127	21.2
40–49 years	56	18.6	47	15.8	103	17.2
50–59 years	39	13.0	37	12.4	76	12.7
60–69 years	20	6.6	31	10.4	51	8.5
70 and more	5	1.7	21	7.0	26	4.3
TOTAL	301	100.0	298	100.0	599	100.0

Note: One Roma respondent did not state his age.

study found that only about 69.6% of Roma go for regular preventive check-ups and that women go for preventive check-ups significantly more often than men. This led us to conclude that, among the Roma, participation in preventive check-ups was significantly linked to gender.

The next part of the text describes the results of anthropometric measurements. The measured body weight and height served to calculate Body Mass Index (BMI). Bimanual impedance was used to assess total body fat (%). These results are presented in Tables 3 and 4.

We assumed that physicians focused on these indicators during preventive check-ups, or that patients with higher BMIs or higher total body fat would receive additional attention, based on these numbers, from general practitioners. However, our results suggest otherwise; with regard to total body fat in Roma respondents, no statistically significant association between "physician interest in the patient's body weight and total body fat percentage", i.e., physician interest in Roma body weight was not related to the percentage of total body fat., however the question rises, to what level are the physicians equipped with body fat measuring devices. On the other hand, a statistically significant association between physician interest Roma body weight and BMI was identified. Physicians spoke significantly more often with persons with higher BMIs about their body weight. This led to the observation that physician interest in body weight of the Roma respondents was significantly linked their BMI.

Tab. 3. BMI (Body Mass Index).

Group	Roma		Majority population		Total	
	N	%	N	%	N	%
under 18.4 incl. – underweight	9	3.0	6	2.0	15	2.5
18.5–24.9 – normal weight	106	35.2	121	40.6	227	37.9
25.0–29.9 – overweight	90	29.9	120	40.3	210	35.1
30.0–34.9 – 1st-degree obesity	53	17.6	38	12.8	91	15.2
35.0–39.9 – 2nd-degree obesity	32	10.6	12	4.0	44	7.3
40.0 and more – 3rd-degree obesity	11	3.7	1	0.3	12	2.0
TOTAL	301	100.0	298	100.0	599	100.0

Note: BMI not available for one Roma respondent.

Tab. 4. Body fat (percentage).

Group	Roma		Majority population		Total	
	N	%	N	%	N	%
Fat below 14.99% incl.	20	6.8	7	2.4	27	4.6
Fat 15.00–24.99%	70	23.8	106	35.9	176	29.9
Fat 25.00–34.99%	89	30.3	109	36.9	198	33.6
Fat 35.00% and more	115	39.1	73	24.8	188	31.9
TOTAL	294	100.0	295	100.0	589	100.0

Note: Body fat was not measurable in 8 Roma and 3 from the majority population.

Tab. 5. Consumption of meals in fast food restaurants.

Group	Roma		Majority population		Total	
	N	%	N	%	N	%
Not at all	153	58.7	202	70.2	355	64.9
1–2× per week	79	30.4	85	29.5	164	29.9
3–4× per week	21	8.1	1	0.3	22	4.0
5–6× per week	1	0.4	0	0.0	1	0.2
Every day	3	1.2	0	0.0	3	0.5
Several times a day	3	1.2	0	0.0	3	0.5
TOTAL	260	100.0	288	100.0	548	100.0

Note: 42 Roma respondents and 10 majority population respondents did not answer the question.

The results also showed that physicians did not routinely ask respondents attending preventive check-ups about nutrition and eating behaviors. Certainly, specific questions on this subject could help identify inappropriate eating behaviors, and eating behavior interven-

tions could be discussed as a basic precondition for obesity prevention.

Inappropriate eating behaviors also include eating habits as they relate to fast foods (Table 5). Statistically significant differences between Roma and the majority population were found in this area. Roma ate in fast food restaurants (3 to 4× per week), which was significantly more often compared to the majority population. Of the Roma respondents, 41.3% reported eating in fast food restaurants at least once per week, while only 29.8% of the majority reported the same frequency. For the higher frequencies (i.e., 5× or more per week), both groups were significantly similar, although, the total number of respondents with such eating habits was extremely low. However, it is not that majority group didn't eat out, they simply tended to eat in more traditional (i.e., non-fast food) restaurants more often.

Regular food intake is also important with regard to good nutrition and weight control. The results in Table 6 show that Roma eat less regularly than the majority population. Of the majority population, 77.8% reported eating regularly vs. 69.3% of Roma (α=0.05).

We also determined whether respondents observe regular meal schedules (i.e., meal timing) relative to breakfast, morning snack, lunch, afternoon snack, and dinner, results are presented in Table 7. Since respondents could mark several options, 1914 answers were obtained. Statistically significant differences were found for lunch, with more Roma reporting having lunch each day, and for an afternoon snacks, which were more often consumed by the majority. Results for other meals showed no statistical differences.

Table 6. Regular food intake.

Group	Roma		Majority population		Total	
	N	%	N	%	N	%
Yes	201	69.3	231	77.8	432	73.6
No	89	30.7	66	22.2	155	26.4
TOTAL	290	100.0	297	100.0	587	100.0

Note: 12 Roma respondents and 1 majority respondent did not answer the question.

Tab. 7. Daily rhythm of food intake.

Group	Roma		Majority population		Total	
	N	%	N	%	N	%
Has breakfast	174	22.4	243	21.4	417	21.8
Has morning snack	83	10.7	120	10.6	203	10.6
Has lunch	226	29.1	277	24.3	503	6.3
Has afternoon snack	40	5.1	136	12.0	176	9.2
Has dinner	184	23.7	266	23.3	450	23.5
Has something after dinner	70	9.0	95	8.4	165	8.6
TOTAL	777	100.0	1137	100.0	1914	100.0

Note: 33 Roma respondents and 4 majority respondents did not answer the question. Respondents could mark multiple answers

DISCUSSION

The study shows that the Roma, living in the South Bohemia Region of the Czech Republic, suffer from overweight and obesity and inappropriate eating behaviors appear to be a significant contributing factor. A person's health or health treatment is a function of many factors, including personal responsibility. On the other hand, not everyone has adequate information/education about how to best manage their health and how life style choices can affect their health. We know that "lifestyle" plays a significant role in a person's overall health. Duffková (2005) discusses this term in her publication and characterizes it from multiple perspectives, stating that it is a system of significant activities and relationships, life expressions and habits characteristic for the individual, the family, or the community. This suggests that not only the individual's lifestyle but also the lifestyle of their culture or particular community is also influential. Therefore, prevention, regardless of target, cannot be focused only on the individual but must also include the individual's family and community. The need for community care, or community nursing, respectively, was pointed out by Tóthová *et al.* (2014); the results of their study showed the need for integration of community nursing into the health care system of the Czech Republic as a way to improve the effectiveness of preventive interventions. The obligations of each nurse is to carry out health education and health support, as well as support of public health are highlighted by other authors too (Whitehead 2000; Kemppainen *et al.* 2012). Also according to Mikšová *et al.* (2014) education within the preventive activities is one of the key competencies of a nurse (Šulistová and Trešlová 2012).

According to the World Health Organization, about 2.8 million people die as a consequence of overweight or obesity every year (WHO 2014). It is obvious that obesity is a widespread problem, and the Roma population is not exempt. As we know, health literacy of the Roma population is not very good (Šedová *et al.* 2014). She also states that obesity is perceived more as an aesthetic, than a health problem, which is directly related to the values, beliefs, and faith of the Roma. Šedová *et al.* (2014) noted that each ethnic group requires a unique approach to achieve maximum benefits from health care and prevention; health care workers (educators) need to be aware of cultural differences so that interventions can be individualized as much as possible. The history and background of the Roma and their socio-economic status was highlighted by Gill (2009). Gill pointed out that assisting the Roma requires good communication with both individuals and their families, but it also good communication with the Roma community itself.

Our study was focused on certain eating behaviors, in particular on eating habits, which undoubtedly contribute to overweight and obesity. They include consumption of regular meals, food quantity and nutritional quality, and daily meal schedules. The results showed that the Roma living in South Bohemia Region eat more frequently in fast food restaurants. We believe this is influenced by the ease, availability, and affordability of fast food. These restaurants are popular choices of children and adolescents who tend to eat there more often. We know that these types of eating habits are excellent targets for preventive interventions, since there are studies that have shown a strong association between eating fast food and the development of functional disorders of the digestive tract (Shau *et al.* 2016). Additionally, we have evidence that poor nutrition and poor eating habits have been linked to school performance (Fu *et al.* 2007; Kim *et al.* 2016). However, prevention focused on children requires a much more comprehensive approach. Roblin (2007) points out that successful prevention of child obesity is based on a combination of interventions. The interventions involve school programs focused on nutritional education, dietary changes, exercise and, ultimately require the involvement of the entire family. The differences in overweight and obesity between Roma and the majority population were addressed by Menghetti *et al.* (2014). Their study drew attention to the fact that the incidence of hypertension, overweight, and obesity in children at a selected school was lower than the prevalence observed at the same school two years prior. The improvement was due to a complex intervention that sought to change eating habits including integration of breakfast into the diet, selection of high quality foodstuffs for lunch and dinner and, most of all, increased extracurricular sporting activities (which had a 92% participation rate).

Another area of research involved eating behaviors. Problems with eating behaviors were detected. The Roma eat less regularly than the majority population. In connection with regular healthy nutrition, the influence of economic conditions on eating habits must be pointed out. Prokešová *et al.* (2015) found that Roma would change their eating habits if they had higher incomes. On the contrary, the majority population would not change their diet or eating habits based on income. This area is very closely related to the amount spent for food per adult family member per month; significantly more Roma reported amounts of 1000 CZK/mo, with the highest amount being over 5000 CZK/mo, which may be attributed, as Prokešová *et al.* (2016) stated, differences in social status within the Roma communities.

The negative consequences of irregular diets and meals cannot be neglected. Varady (2016) provided an overview of the effect of meal frequency on metabolic diseases risk factors. Recent intervention studies (published in the last 12 months) suggest that a reduction in body weight, together with reduced meal frequency (two meals per day), can be more positive than compared to the widely popularized (six meals per day). As for meals timing, postponing the main meal (lunch) by 3.5 hours does not have any impact on body weight, but may increase glucose tolerance of young healthy adults. Prokešová *et al.* (2015) noted the limitations of the study, suggesting that further verification of the conclusions is needed. It should also be noted that beyond eating habits, the composition and quantity of food consumed is also very important as well.

As for this study, we are aware of its limited character regarding the size and selection of the respondent groups, as well as potential regional bias since all respondents were from the South Bohemia Region of the Czech Republic.

CONCLUSION

The results show that Roma tends more toward inappropriate eating behaviors than the majority population, primarily regarding irregular meals times and consumption of fast foods. The results suggest that Roma are more at risk due to obesity than the majority population. Together with the results of anthropometric measurements, these findings are valuable mainly for primary health care workers. Interventions can be effective in influencing health conditions among individuals but, they can also be effective in improving the health conditions of entire communities. However, it is not possible to rely only on primary health care workers, it is also necessary to motivate individuals, groups, and communities to take an active role in prevention of overweight and obesity (Tóthová *et al.* 2015). Nesvadbová *et al.* (2009) stated that a top priority needs to be the introduction of health-education activities with a broad range of preventative information aimed at improving the overall health of the Roma population.

Among other things, the results of this study will help form a foundation for creating interventions directed at weight loss in Roma communities.

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Conflict of Interest: *The authors report no conflicts of interest.*

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