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ORIGINAL PAPER

NUTRITION MYTHS – THE FACTOR INFLUENCING THE QUALITY OF CHILDREN'S DIETS

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Abstract

Aim: To analyse the influence of parents´ belief in nutrition myths on the frequency of their serving certain foods to their children. *Design:* Cross-sectional study. *Methods:* Survey carried out with 297 respondents – parents of children aged 5–18 years. The data collection took place between September 2013 and December 2014. The questionnaire focussed on 14 nutrition myths related to selected foods (milk, dairy products, meat, offal, fruit, vegetables, eggs, fish, legumes, soya, and flour dishes). At the same time, the parents reported the frequency of their serving the monitored foods to their children. In the statistical analysis, Spearman's rank correlation coefficient was used. *Results:* For nine nutrition myths we found significant negative coefficients between a certain nutrition myth and the frequency of the serving of the food. The nutrition myths related to the consumption of fish (r = -0.328), eggs (r = -0.203), soya (r = -0.301; -0.290), offal (r = -0.155), meat (r = -0.128), milk (r = -0.272; -0.254), and fruit/vegetables (r = -0.104). *Conclusion:* The belief in nutrition myths appears to be a determinant modifying parental behaviour and subsequently the quality of children's diets.

Keywords: nutrition myth, parent, child, serving food, food quality.

Introduction

The eating behaviour of children and adolescents formed in early childhood plays an important role in the prevention of many diseases (Birch et al., 2007). Using various strategies (Mitchell et al., 2009; Blissett, 2011), parents can positively or negatively influence children's self-regulation mechanism of food intake (van Strien, Bazelier, 2007), quality of diet, attitudes to and preferences for food, and weight (Rhee, 2008; Ventura, Birch, 2008). Parents' feeding style is determined by a wide range of factors, for example, by their psychological state (Mitchell et al., 2009), body satisfaction (Gray et al., 2010), the mother's mental health (Haycraft, Blissett, 2012), their income (Hoerr et al., 2009), level of education (Saxton et al., 2009), level of knowledge of food and meals (Fleary et al., 2013), and, probably, also by nutrition myths. Much of the information on nutrition presented in the literature as fact is actually myth i.e., a concept insufficiently supported or even contradicted by scientific evidence.

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Nutrition myths exist regarding micronutrients, macronutrients, non-nutrients, and food energy (Lesser et al., 2015). Books, websites and papers describe and analyse a variety of nutrition myths and, based on scientific data, refute these misconceptions (Oliveriusová, 2003; Minárik, 2011; Lesser et al., 2015).

The term "myth" has a wide range of meanings, one of which is "a false or unreliable story or belief" (Baldick, 2015). Myths can create patterns of behaviour (Eiss, 2013). If a myth – i.e., a false belief in positive or negative aspects of a food/meal – is strong enough, it can determine the behaviour of an individual. The parental belief in nutrition myths could be a possible factor influencing the quality of children's diets. However, in the literature this phenomenon has not yet been adequately studied.

Aim

To analyse the influence of parents´ belief in nutrition myths on the frequency of feeding certain foods to their children.

To analyse the influence of age, education, sex, and residence of a respondent on his/her belief in nutrition myths.

Methods

Design

Cross-sectional study.

Sample

The respondents were the parents of children. The children were aged 5–18 years and did not have any special dietary requirements. 297 respondents aged 19–53 years, with an average age of 35.50 years (SD = 7.61), were included in the analysis. They were predominantly female (n = 252; 84.8%). 57.2% of respondents lived in rural areas and 41.4% in towns. The respondents lived in the Prešov and Košice Regions.

Data collection

The survey was carried out between September 2013 and December 2014. The questionnaires were distributed to the offices of GPs for children and adolescents, and to pre-school facilities. At the time of completing the questionnaire, the respondents had at least one child aged ≥ 5 years.

The belief of respondents in nutrition myths was analysed using questionnaire (Table 1). The myths focused on milk, dairy products, fruit and vegetables, legumes, soya, fish, eggs, meat, offal, and flour dishes. The respondents gave their opinion on selected nutrition myths using the 5-level Likert scale (from "strongly agree" to "strongly disagree"). A higher average value indicates a stronger belief in a myth. For individual myths, Cronbach's alpha ranged from 0.608 to 0.661. When selecting myths to include in the questionnaire, we used the nutrition myths most commonly discussed in Slovak literature and on web portals that are available to the general public (Oliveriusová, 2003; Minárik, 2011, www.babetko.rodinka.sk; www.najmama.sk; www.vyzivadeti.sk). The criteria for selecting myths included: comprehensibility of the nutrition myth to the general public, the myth pertained to diet and food preparation, and cultural and social aspects of diets for the Slovak population.

We analysed the frequency of feeding/serving food to children by the respondents – their parents. Namely the following kinds of food: milk, yogurt, fruit, vegetables, legumes, soya, fish, eggs, meat, offal, and flour dishes. The 10-level Likert scale (0 – "never", 10 – "six times a day or more frequently") was used. Cronbach's alpha ranged from 0.630 to 0.696.

Data analysis

For statistical data processing, SPSS 17.0 software was used. Within the descriptive statistics, we used the calculation of the mean (M) and the standard deviation (SD). Given the negative or positive curvature of data for most of the monitored variables, we used nonparametric methods of data processing – Spearman's rank correlation coefficient to analyse the relationship between the influence of nutrition myths and the frequency of serving food, the Mann-Whitney test (or Kruskal Wallis test) to analyse the influence of the monitored factors on the belief in nutrition myths. In evaluating the statistical significance, a significance level of $p < 0.05$ was used.

Table 1 Descriptive data on nutrition myths

Myth	M (SD)
Milk causes osteoporosis (= bone rarefaction).	1.89 (0.76)
Heat-treated milk does not contain any nutrients.	2.41 (0.82)
Creamy yogurt contains more calcium than regular yogurt.	3.00 (0.93)
Fish is not necessary in the diet.	1.89 (0.94)
Eggs contain a large amount of cholesterol and are therefore unhealthy.	2.35 (1.01)
Eating flour dishes results in weight gain.	2.15 (1.03)
Legumes are only suitable for vegetarians.	1.91 (0.96)
Soya is harmful to health.	2.02 (0.72)
Soya is not a complete food and is hard to digest.	2.24 (0.82)
Heat treatment of vegetables results in loss of all vitamins.	2.04 (0.95)
Fruit and vegetables are a sufficient source of calcium for a growing organism.	2.46 (1.05)
Fruit and vegetables from other climatic zones are not healthy.	2.18 (0.82)
Liver and other offal are poisonous.	2.26 (0.84)
Meat is not healthy, a child's body does not need it.	1.66 (0.71)

M – mean, SD – standard deviation

The respondents were divided by sex (male, female), residence (town, rural area), education (primary/apprenticeship education, upper secondary education without a school-leaving certificate, upper secondary education with a school-leaving certificate, higher education), and age (≤ 30 years, 31–39 years, ≥ 40 years), with the age categorization of respondents based on the developmental stages of adulthood – young, middle, and older adulthood (Langmeier, Krejčířová, 2006).

Results

14 nutrition myths were analysed. The average values ranged from 1.66 to 3.00. The lowest level of belief was found in myths related to meat (M = 1.66; "Meat is unhealthy, a child's body does not need it"), legumes (M = 1.91; "Legumes are only suitable for vegetarians"), fish (M = 1.89; "Fish is not necessary in the diet"), and milk (M = 1.89; "Milk causes osteoporosis"). The respondents expressed the highest belief in the myth ´Creamy yogurt contains more calcium than regular yogurt´ (M = 3.00). (Table 1)

The respondents that had completed primary/apprenticeship education expressed the lowest level of belief in nutrition myths (M = 1.52), while the highest level of belief was identified in the group of respondents that had completed upper secondary education without a school-leaving certificate (M = 1.95; p = 0.005). (Table 2)

The respondents' age was an area in which statistically significant differences were found (p = 0.019). The highest level of belief in the nutrition myths examined was found in the age category 31–39 years (M = 1.82), while the lowest level of belief was found in the age category ≥ 40 years (M = 1.65). (Table 2)

The analysis of the survey data indicated the highest level of belief in nutrition myths among the male respondents (M = 1.91), as compared to the female respondents (M = 1.73; p = 0.016). The belief in nutrition myths among the respondents living in rural areas (M = 1.79) and the respondents living in towns (M = 1.70) was very similar, and not statistically significant (p = 0.165). (Table 2)

Table 2 Age, education, sex, residence of respondents and its influence on the belief in nutrition myths

		Total score of all nutrition myths		
	n	**M**	**SD**	**p**
Age				
≤ 30 years	91	1.79	0.52	
31–39 years	106	1.82	0.55	**0.019**
≥ 40 years	100	1.65	0.55	
Sex				
Male	45	1.91	0.35	**0.016**
Female	252	1.73	0.51	
Education				
primary, apprenticeship education	25	1.52	0.51	
upper secondary education without school-leaving certificate	38	1.95	0.51	**0.005**
upper secondary education with school-leaving certificate	152	1.79	0.45	
higher education	74	1.69	0.52	
Residence				
rural area	170	1.79	0.51	0.165
town	123	1.70	0.48	

M – mean, SD – standard deviation

When correlating the individual nutrition myths with the serving of a certain food, negative correlation coefficients were identified. An exception was the myth "Heat treatment of vegetables results in loss of all vitamins" (r = 0.025). Significance was determined for nine nutrition myths. These myths related to the consumption of fish (r = -0.328), eggs (r = -0.203), soya (r = -0.301; -0.290), offal (r = -0.155), meat (r = -0.128), and milk (r = -0.272; -0.254). The correlations were mostly small (0.1–0.3). The correlations identified indicate that an increasing belief in a nutrition myth results in a decrease in the serving of the given food to children by their parents. (Table 3)

Table 3 Correlations between nutrition myths and the frequency of serving foods

Myth	Frequency of serving
	milk
Milk causes osteoporosis.	-0.272**
Heat-treated milk does not contain any nutrients.	-0.254**
	yogurt
Creamy yogurt contains more calcium than regular yogurt.	-0.039
	fish
Fish is not necessary in the diet.	-0.328**
	eggs
Eggs contain a large amount of cholesterol and are therefore unhealthy.	-0.203**
	flour dishes
Eating flour dishes results in weight gain.	-0.044
	legumes
Legumes are only suitable for vegetarians.	-0.039
	soya
Soya is harmful to health.	-0.301**
Soya is not a complete food and is hard to digest.	-0.290**
	vegetables
Heat treatment of vegetables results in loss of all vitamins.	0.025
	vegetables/fruit* **
Fruit and vegetables are a sufficient source of calcium for a growing organism.	-0.023
Fruit and vegetables from other climatic zones are not healthy.	-0.104*
	offal
Liver and other offal are poisonous.	-0.155**
	meat
Meat is not healthy, a child's body does not need it.	-0.128*

**The correlation is significant at the level 0.05. **The correlation is significant at the level 0.01. ***Composite score: average (vegetables + fruit)*

Discussion

Studies analysing the eating habits of children and adolescents in developed countries suggest similar shortcomings. The most commonly identified problems are skipping breakfast, eating less fruit, vegetables and milk, and a high intake of sweets or sweet drinks (Babinská et al., 2007; Golley et al., 2011; Jensen et al., 2013). The quantity and quality of diet is significantly influenced by parents (Birch et al., 2007). It can be assumed that parents – when purchasing food and serving food to their children – are influenced by their personal belief in nutrition myths. To our knowledge, nutrition myths have not yet been analysed as a possible factor influencing parental behaviour towards children's diet.

Taking into account the fact that the average values for individual myths ranged mainly below the middle mark (the only exception being the myth that "Creamy yogurt contains more calcium than regular yogurt" M = 3.00), parental belief in the nutrition myths examined was relatively low. A low to moderate level of belief in nutrition myths is probably related to the popularization of diets in terms of quantity and quality in comparison with the past (e.g., implementation of various projects in preschool and school facilities, involving not only children, but also their parents, internet forums, discussions about healthy eating on TV, and descriptive data on food labels about product composition and its effects on health). The identified data on the belief in nutrition myths in the survey sample of parents are globally perceived as a positive trend. Nutrition myths arise from mistaken information about foods, their composition and their effects on health. We assume that – as indicated by the results of the survey – the level of belief in the myths discovered signalizes a qualitative shift in parental awareness of this issue, and, possibly, their lower influence on eating behaviour. Belief in myths is influenced by gender – male respondents expressed higher levels of belief than female respondents. The role of a mother and a carer has clearly defined rights and duties (Vágnerová, 2007), including the provision of food for her children and family (Fraňková et al., 2013). The lower level of belief in nutrition myths expressed by mothers can be explained by their position as coordinator and provider of nutrition for their family. It is highly likely that this role is also closely related to the greater involvement of women in the issue of healthy eating. It is also necessary to point out that the differences found may be related to the different sizes of the examined groups.

Significant differences were found in belief in myths with regard to the age of parents. The lowest level of belief was demonstrated by parents aged ≥ 40 years. Between 40–50 years of age there is a decline in physical performance and increasing susceptibility to disease. Individuals begin to focus more on their health and to modify their lifestyle accordingly (Říčan, 2004). Some diseases emerging at this age can stem from eating habits, which probably encourages these respondents to take a proactive approach to the acquisition of information relating to diet, and, thus, to a lower level of belief in nutrition myths.

The highest level of belief in nutrition myths was expressed by respondents that had completed secondary education without a school-leaving certificate (M = 1.95). However, a relatively high level of belief in nutrition myths was also found among parents that had completed secondary education with a school-leaving certificate (M = 1.79) and with higher education (M = 1.69). The views of respondents on nutrition are likely to have a more significant impact on belief in myths than the level of education completed. Education, as indicated by the results of the survey, does not fully correlate with belief in nutrition myths, but is associated with parental interest in health and healthy nutrition. It has been shown that there is a relationship between mothers' nutritional knowledge and the diet quality of their children (Yabanci et al., 2014); as a result, level of nutritional knowledge could play a greater role in dispelling nutrition myths than level of education.

The survey indicated that a stronger belief in nutrition myths influences parents' attitude to a food and subsequently changes his/her eating behaviour. Belief in myths encourages parents not to offer a given food to children at the same frequency at which they would offer the food if they were not influenced by nutrition myths. Parents build up the children's eating habits by, among other things, purchasing foods, involving the child in preparing foods, serving foods, and availability/accessibility of healthy or unhealthy foods in their household (these aspects are called "parent – provider of food" in the literature) (Savage et al., 2007). When selecting and serving food, the parent is influenced by a number of stimulus. Nutrition myth and belief in their content can be the motivating factor of parent's behaviour, thus changing their attitude to children's diets. In this sense, nutrition myths can be perceived as a factor negatively influencing the diets of children and adolescents. However, this is a factor of less significance if we take into account the identified significant correlation coefficients ranging from -0.104 to -0.328. The relationship between the variables "nutrition myths" and "serving of food by parents" is not very strong.

Despite lower correlation coefficients identified within the survey, it is advisable to pay attention to parental attitudes to myths and, if necessary, to change misguided attitudes. Eliminating misconceptions about food can support parents' adaptation to new, healthy foods (Wansink et al., 2014) and thus influence their behaviour in relation to their own diet and the diet of their children.

Conclusion

The core objective of the survey was to analyse nutrition myths as a possible determinant of children's diets. As mentioned in the introduction, children's diets are influenced by a wide range of factors directly related to parents or their children. The eating behaviour of parents in relation to children's food is often a response to children's weight and children's behaviour during eating, but can also be influenced by the level of nutritional knowledge of parents. The survey results indicate an interrelationship between nutrition myths and the eating behaviour of parents. With regard to the strength of the correlation coefficients, belief in nutrition myths is a factor that should be considered when analysing the approach of parents to children's diets. However, its intensity should not be overestimated.

Ethical aspects and conflict of interest

The respondents were thoroughly informed of the objective of the survey and agreed to their inclusion in the survey process. The authors declare that theyhave no conflict of interest and all ethical aspects were respected in the course of the survey.

Author contribution

Conception and design (SM), data collection, data analysis and interpretation (SM), manuscript draft (SM), critical revision of the manuscript (ĽL), final approval of the manuscript (SM).

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