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Nutritional habits in a primary school children: generational and gender differences

Maria Luisa E. Luisi¹, Raffaele Molino Lova¹, Luisa Bertulli¹, Francesco Sofi^{1,3,4},
Angelo Pietrobelli², Rosanna Intini¹, Claudio Macchi^{1,3},
Barbara Biffi¹, GianFranco Gensini^{1,3}

¹ Don Carlo Gnocchi Foundation, Onlus IRCCS, Florence, Italy; ² Pediatric Unit, University of Verona, Italy;
³ Department of Medical and Surgical Critical Care, University of Florence, Italy; ⁴ Regional Agency of Nutrition,
Azienda Ospedaliero-Universitaria Careggi, Florence, Italy

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Corresponding Author:

Francesco Sofi,
Department of Medical and Surgical
Critical Care, University of Florence,
ITALY
francescosofi@gmail.com

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Abstract

The role of healthy diet as an effective tool to prevent chronic diseases is well established. Recently, most of the attention has been paid to food education since childhood. Aim of the present study was to evaluate generational and gender differences in perceiving the importance of healthy diet in a sample of subjects ranging from children to their grandparents. We studied 226 subjects, 74 children attending a primary school, 82 parents and 70 grandparents. Children received the Food Frequency Questionnaire and two "ad hoc" questionnaires, the former about general principles of food education and the latter about perception of the importance of healthy diet and the personal engagement to pursue it, while parents and grandparents received only this latter questionnaire. Both boys and girls reported to have little information on the different types of fats and which fats are harmful for their health. With regard to females, mothers' engagement to pursue a healthy diet was significantly higher than that of grandmothers, while girls' engagement did not exceed the already high engagement of their mothers. Regarding males, the engagement followed a similar increase across generations, without significant differences. However, despite different courses, no significant gender difference was detected within the new generation. This finding seems to be of extreme importance for all the professionals involved in food educational programs for childhood.

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INTRODUCTION

The importance of nutrition in the prevention of chronic diseases is well established (1,2). Many studies in the last decades have reported a beneficial role for dietary habits in reducing the risk of mortality and morbidity for diseases (3,4). Recently, due to the increasing prevalence of some traditional risk factors such as obesity and hypertension among children and adolescents, much of the research interest has been shifted to these populations of subjects particularly for what is related to food education and lifestyle habits (5). Accordingly, some guidelines for primary prevention of cardiovascular diseases in childhood have

been published (6,7), underlying the importance of age-appropriate portion sizes and providing caregivers with recommendations on frequency of eating and choice of foods. Recently, it has been reported the importance of sociological aspects emerging from generational and gender differences related to nutrition, food preparation and meals consumption, as well as the role of the media on indirect influence of food education (8). To date, the assessment of knowledge and motivation of parents is necessary to provide realistic definitions of appropriate nutritional behavior in order to involve parents as potential intermediary in changes of children lifestyle (9).

The aim of the present study was to evaluate possible generational and gender differences in perceiving the importance of a healthy diet in a sample of children attending a primary school, together with their parents and their grandparents.

SUBJECTS AND METHODS

We studied 226 subjects, 74 children (35 males and 39 females) aged 8 to 11 years, enrolled in the 3rd, 4th and 5th grades of a primary school located in Florence, Italy, 82 parents of the above children (35 fathers and 47 mothers) aged 36 to 54 years, and 70 grandparents (24 grandfathers and 46 grandmothers) aged 57 to 89 years. All the children were Caucasian and of Italian descents.

Children received three questionnaires, a multiple-choice 10-items questionnaire on general principles of food education, a categorical-choice 10-items questionnaire on the importance of a healthy diet, the

personal engagement to pursue it, the family attitudes to follow the diet and the capacity to teach its basic rules, and a previously validated Food Frequency Questionnaire.¹⁰⁻¹³ Parents and grandparents received a categorical-choice 12-items questionnaire to assess the generational differences on the importance of diet, food education and nutrition domestic habits.

Details about the questionnaires specific items are shown in Tables 1, 2, 3 and 4. The key question “Do you apply yourself to follow a healthy diet?” was present in all the three questionnaires. According to the Italian law, all questionnaires were anonymous. The School Ethical Committee approved the study and parents and grandparents signed an informed consent before participation in the study. Statistical analysis was performed using the two-tailed Pearson χ^2 test, or the Fisher binomial test as appropriate. Type 1 error was set at $p < 0.05$. Data were analyzed using STATA 7.0 software from Stata Corporation, Texas, USA.

Table 1. Gender comparisons within children: multiple-choice questionnaire. Values are expressed as percentages of right answers. Significance was tested using two-tailed Pearson χ^2 test.

	Boys n° 35	Girls n° 39	Boys vs Girls p
What do we mean when we say: "is this food hypercaloric"?	75%	62%	NS
Which food contains more calories in the same weight?	33%	38%	NS
Is a balanced diet good for health?	54%	50%	NS
Is it important to eat every day fruit and vegetables?	63%	81%	NS
Is it important to follow a vitamin-rich diet?	46%	58%	NS
Which foods contains fats useful for health?	25%	23%	NS
What should we do to maintain a good health?	67%	88%	NS
Which are the vegetable fats most dangerous for health?	0%	4%	NS
What should diet mainly be made of?	33%	35%	NS
How do you consider the water?	88%	96%	NS

RESULTS

Results are summarized in Tables 1 to 4.

Among children, questions related to the knowledge of the basic principles of food education did not show any significant difference between males and females (Table 1), even if girls asserted to know the basic principles more than boys (33% vs. 11%, $p < 0.05$) (Table 2). Furthermore, girls reported more attention than boys to nutrition matters coming from newspapers or television (72% vs. 34%, $p < 0.005$) (Table 2). By analyzing all children (Table 2, right column), 81% asserted to choose a food because it was healthy and 73% because it was good. All children considered fundamental to eat in a proper way, and 96% of them thought that food education should be taught at school.

Ninety-three percent of children had parents who used to teach them to eat in a healthy way, 58% of children used to express their food preferences and 64% was satisfied. Of interest, almost the whole population of boys and girls asserted not to have knowledge on the vegetable fats that can be dangerous for their health, and, similarly, both boys and girls have little knowledge on what types of fats should be consumed for their health.

The statistical evaluation (Table 3) confirmed that boys and girls had similar dietary habits. Only 4 out of 18 food frequency questionnaires' items resulted significantly different. Boys reported to eat fish, fruit and salt meat more frequently than girls ($p < 0.05$ for the three items). Girls, on the other hand, reported to eat vegetables more frequently than boys ($p < 0.05$).

Table 2. Gender comparisons within children: categorical-choice questionnaire. Values are expressed as percentages of positive answers. Significance was tested using two-tailed Pearson χ^2 test.

	Boys n° 35	Girls n° 39	Boys vs Girls p	All Children n° 74
Do you know the basic principles of food education?	11%	33%	< 0.05	23%
Do you apply yourself to follow a healthy diet?	91%	95%	NS	93%
When you choose a food, do you choose it because you like it?	77%	69%	NS	73%
When you choose a food, do you choose it because you think that it is healthy?	83%	79%	NS	81%
Do your parents teach you to eat in a healthy way?	91%	95%	NS	93%
Do you express your preferences about food?	63%	54%	NS	58%
Are your requests usually satisfied?	60%	67%	NS	64%
Is it important for health to eat in a healthy way?	100%	100%	NS	100%
Did you ever pay your attention to matters about nutrition from newspapers or television?	34%	72%	< 0.005	54%
Do you think that food education should become a school subject?	94%	97%	NS	96%

With regard to parents (Table 4), mothers cook and decide what to eat more frequently than fathers (86% vs. 37%, $p < 0.001$ and 68% vs. 22%, $p < 0.001$, respectively). Furthermore, mothers reported to read newspaper or magazine articles about nutrition more frequently than fathers (89% vs. 50%, $p < 0.005$). With regard to grandparents (Table 4), grandmothers were more able to cook than grandfathers (94% vs. 59%, $p < 0.005$), and cooked more frequently than grandfathers (91% vs. 24%, $p < 0.001$, respectively). Even in this case, women decided what to eat more frequently than men (62% vs. 28%, $p < 0.025$).

A generational comparison between parents and grandparents (Table 4) and between mothers and grandmothers was found. To the question “*Are children involved in the choice of food?*” parents answered that children are involved more frequently than grandparents (76% vs. 56%, $p < 0.05$), mothers vs. grandmothers (79% vs. 56%, $p < 0.025$) and fathers vs. grandfathers (77% vs. 56%, $p < 0.05$). With regard to the question “*Do you usually read newspaper or magazine articles about nutrition?*” comparison between mothers and grandmothers showed a significant difference (89% vs. 69%, $p < 0.025$), while no difference was found between parents and grandparents and between fathers and grandfathers. No significant difference was found between parents and grandparents, and between mothers and grandmothers for the question “*Do you have breakfast at home?*”. Fathers used to have breakfast at home less frequently than grandfathers (78% vs. 100%, $p < 0.025$). With regard to the question “*Do you have lunch at home?*” parents used to have lunch at home less frequently than grandparents (48% vs. 98%, $p < 0.001$). No significant difference was detected for the question “*Do you have dinner at*

home?”. To the question “*Do you apply yourself to follow a healthy diet?*” parents asserted to apply themselves more than grandparents (89% vs. 70%, $p < 0.01$) and mothers more than grandmothers (95% vs. 76%, $p < 0.01$) but father did not apply significantly more than grandfathers (81% vs. 59%, $p = NS$). Interestingly, there was no significant difference between males and females when the same question was asked to the children (91% vs. 95%, $p = NS$) (Table 2).

DISCUSSION

Previous papers demonstrated diet to play a major role for primary and secondary prevention of chronic diseases, by also influencing main cardiovascular risk factors (1-5). Recently, researchers and clinicians posed their attention on the relation between food and diseases in the category of children and adolescents as due to the increasing prevalence of obesity and other risk factors in these subjects (6,7). It has been demonstrated, in fact, that correct information given in these population of subjects represents the basis for a correct food education that will likely maintain a good health.

The aim of this study was to investigate the possible generational and gender differences existing on the importance of healthy diet in a sample of subjects ranging from children to their grandparents. Our sample was taken from a catholic school of Florence, Italy, and it represents a main limitation of the study. It has been demonstrated, in fact, that subjects of low socio-economic class and educational level showed lower knowledge of risk factors related to cardiovascular diseases and nutrition (14).

Table 3. Gender comparisons within children: Food Frequency Questionnaire. Values are expressed as absolute numbers. Significance was tested using two-tailed Pearson χ^2 test.

	Girls (n° 39)										Boys (n° 35)										Boys vs Girls p		
	Monthly Frequency			Weekly Frequency				Daily Frequency			Mean Weekly Frequency	Monthly Frequency			Weekly Frequency				Daily Frequency			Mean Weekly Frequency	
	0	1	2-3	1	2	3-4	5-6	1	2	>2		0	1	2-3	1	2	3-4	5-6	1	2			>2
Bisquits / Corn-flakes	2					7	30				6,46	4							31			6,2	NS
Cereals: - Pasta / Rice							10	29			12,21								7	28		12,6	NS
- Bread / Crackers								31	8		15,44								29	6		15,2	NS
Potatoes				5	29	5					2,13		3	25	7							2,31	NS
Pulses		7	16	16							1,32		4	20	11							1,26	NS
Milk / Yogurth	3						4	20	12		8,51	1				2	20	12				9,14	NS
Cheese				3	16	20					2,95		2	15	18							2,97	NS
Meat / Poultry						12	19	8			5,59				6	14	15					6,09	NS
Eggs				2	10	27					3,33				7	28						3,6	NS
Fish		5	19	10	5						0,79	1	4	20	10							1,17	< 0.05
Salt Meat					16	16	5	2			3,59				5	10	14	6				5,03	< 0.05
Vegetables	2			1	1	2	4	29			11,59	3			8	10	10	4				6,23	< 0.05
Fruit	2			1	3	5	20	8			7,59	2				1	10	22				10,97	< 0.05
Pizza & Croquettes	1	6	24	8							1,1		15	9	10	1						1,16	NS
Snacks				4	10	15	10				3,69		2	7	20	6						3,77	NS
Confectionery				4	7	5	11	12			4,82		3	7	6	8	11					4,74	NS
Carbonated drinks		11	11	4	6	5	2				2,37		9	7	7	7	2	3				2,47	NS
Fruit juice				9	11	10	9				3,21		5	7	9	6	3	5				2,99	NS
Wine / Beer	39										0	35										0	NS

Looking at gender differences on the importance of nutrition as an health-promoting factor, a previous study showed that females were more interested than males in pursuing a healthy diet, and that females usually learn more from information campaigns than males (8,14). Our results confirm these findings. In fact, females were more interested than males in nutrition even in a pediatric age. In our young subjects 72% of girls asserted to pay attention to nutrition matters coming from newspapers or television vs. 34% of boys. Furthermore, mothers asserted to read articles about nutrition more than fathers and more than grandmothers, while no significant difference was found between fathers and grandfathers. This confirms a generational trend limited to females, according with our results.

With regard to other generational differences on personal engagement to pursue a healthy diet, a previous study in adults showed some changes in food practices to pursue nutrition recommendations for a healthy diet (15). Our results also confirm these findings. In fact, parents involved children in the decision of food more than grandparents and children asserted that parents used to satisfy their desires related

to food. Furthermore, according to the 93% of children, parents taught them to eat in a healthy way. The most intriguing finding was that the vast majority of children considered diet very important for health: the choose of food was supported by this conviction in 81% of cases and 96% of them believed that food education should be studied at school due to its fundamental importance.

A peculiar feature emerging from our results was related to the increasing interest towards a healthy diet shown through the different generations. With regard to females, the engagement to pursue a healthy diet followed a sort of “hyperbolic” course. In fact, the engagement of mothers was significantly higher than that of grandmothers, while the engagement of little girls did not exceed the already high engagement of their mothers. With regard to males, the same engagement across generations showed a more “linear” increase, without any significant jump. However, despite different courses, no significant gender differences in the engagement to pursue a healthy diet were detected within the new generation (16,17), reaching fairly high levels for both boys (91%) and girls (95%).

Table 4. Generational and gender comparisons within parents and grandparents: categorical-choice questionnaire. Values are expressed as percentages of positive answers. Significance was tested using two-tailed Pearson χ^2 test.

	Relatives						Statistics				
	Mothers n° 47	Fathers n° 35	Grandmothers n° 46	Grandfathers n° 24	Parents n° 82	Grandparents n° 70	M vs F p	GM vs GF p	P vs GP p	M vs GM p	F vs GF p
Do you usually cook?	86%	37%	91%	24%	66%	68%	< 0.001	< 0.001	NS	NS	NS
Do you go to shopping?	95%	81%	94%	65%	89%	84%	NS	< 0.01	NS	NS	NS
Are children involved in the choice of food?	79%	77%	56%	56%	76%	56%	NS	NS	< 0.05	< 0.025	< 0.05
Do you think your wife/husband is more involved than you in perceiving healthy diet?	36%	59%	31%	59%	46%	41%	NS	NS	NS	NS	NS
Do you usually read or have you ever read books about nutrition?	65%	48%	58%	35%	58%	50%	NS	NS	NS	NS	NS
Do you usually read newspaper or magazine articles about nutrition?	89%	50%	69%	59%	71%	65%	< 0.005	NS	NS	< 0.025	NS
Does your wife/husband decide what to eat?	22%	68%	28%	62%	41%	40%	< 0.001	< 0.025	NS	NS	NS
Do you have breakfast at home?	89%	78%	91%	100%	84%	94%	NS	NS	NS	NS	< 0.025
Do you have lunch at home?	49%	46%	100%	94%	48%	98%	NS	NS	< 0.001	< 0.001	< 0.001
Do you have dinner at home?	95%	93%	97%	100%	94%	98%	NS	NS	NS	NS	NS
Do you apply yourself to follow an healthy diet?	95%	81%	76%	59%	89%	70%	NS	NS	< 0.01	< 0.01	NS

M = Mothers; F = Fathers; GM = Grandmothers; GF = Grandfathers.

This finding is in line with other results coming from the present study. The multiple-choice questionnaire used to test the knowledge of basic principles of food education did not show any significant difference between boys and girls. Furthermore, even the FFQ results, despite few differences between genders, confirmed that both boys and girls were engaged to pursue a healthy diet. The more frequent assumption of vegetables showed by girls might be related to the influence of media on models of beauty, and the consequent desire to keep their figure.

Sociological features emerging from our results, such as the fact that fathers are more able to cook than grandfathers, mothers and grandmothers usually cook more than their husbands, and that both mothers and fathers usually consume a lunch out of home, and, limited to fathers, even breakfast, while grandparents have all three meals at home, are probably related to the westernized lifestyle and to the common involvement of mothers in jobs outside home. However, mothers still decide what to eat in family, as grandmothers do. Furthermore, within females, newspapers, magazines and television seem to be relevant sources of information for girls and mothers (18).

In conclusion, our results show that the engagement to pursue a healthy diet changes through generations, with significant differences between parents and grandparents, mainly due to the higher engagement of

mothers compared to grandmothers, and that new generations show encouraging high levels for both boys and girls. All professionals involved in food educational programs should not miss this opportunity for childhood.

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