

Dietary habits in children of immigrant families from developing countries: an Italian multicentre study

Immigrazione infantile ed alimentazione: studio multicentrico italiano

F. CATALDO, M. PACCHIN¹, S. ACCOMANDO, N. PITARRESI, G.P. SALVIOLI²,
AND THE ITALIAN SOCIETY OF PEDIATRICS NATIONAL WORKING GROUP
ON IMMIGRANT CHILDREN (GLNBI)

Dipartimento Materno Infantile, Università di Palermo; ¹ Ufficio di Valutazione Epidemiologica, Azienda ULSS 6 di Vicenza; ² Istituto di Clinica Pediatrica Preventiva e Neonatologia, Università di Bologna

Summary

Objectives. The aim of this study was to investigate the dietary habits of immigrant children who come to Italy from developing countries, and of their families.

Methods. A multicentre cross-sectional study was carried out from Jan. 1st 2003 to Dec. 31st 2004. The study population comprised 1284 immigrant mothers, 629 infants, and 767 children with more than 2 years of age. A structured questionnaire was employed to inquire retrospectively on dietary habits and, on breastfeeding, complementary breastfeeding, bottle-feeding and weaning.

Results. Exclusive and complementary breastfeeding was more frequent and of longer duration among immigrant infants than Italian infants, but not compared to infants living in the immigrants' native countries, compared to whom breastfeeding was lower and of shorter duration. Age and manner of weaning among immigrant infants were similar to Italian ones. Immigrant children older than 2 years preferred foods from their native countries only in a few cases, and the rates of their morning and afternoon snacks were higher in Italy than in their native countries. In Italy, immigrant children consume eggs, fish, vegetables, legumes, and tea less often, and bread, pasta and oat flakes more often than in their native countries. These dietary habits might likely be related to both being born and having migrated to Italy since more than 4 years. Immigrant families are also inclined to adopt Italian dietary habits.

Conclusions. Our investigation suggests that immigrant children and their families are adopting Italian eating habits. Considering the association between diet in infancy and childhood, and the development of some diseases later on in life, paediatricians must pay great attention to dietary habits among immigrant children.

Key words

Dietary habits • Immigrant children

Parole chiave

Abitudini alimentari • Bambini immigrati

Submitted: May 11, 2006
Accepted: September, 29 2006

Corrispondenza:
prof. Francesco Cataldo
Clinica Pediatrica
Ospedale "Aiuto Materno"
via Lancia di Brolo 10/B
90135 Palermo, Italy
Fax +39 091 6834121
E-mail: cescocat@freemail.it

Riassunto

Obiettivi. Obiettivo di questa indagine è conoscere le abitudini alimentari dei bambini immigrati e delle loro famiglie arrivati in Italia dai Paesi in via di sviluppo.

Metodi. Lo studio, condotto dal 1/1/2003 al 31/12/2004, è stato multicentrico e trasversale. Sono state intervistate, mediante un questionario predefinito, 1.284 madri di bambini immigrati e sono state retrospettivamente raccolte notizie sull'allattamento e lo svezzamento di 629 bambini stranieri, sulla alimentazione di 767 bambini immigrati della 2° e 3° infanzia, e sulle abitudini alimentari delle loro famiglie.

Risultati. Nei bambini immigrati la frequenza e la durata dell'allattamento esclusivo al seno e dell'allattamento misto sono più elevate di quelle dei bambini italiani. Tuttavia esse sono sensibilmente ridotte se paragonate a quelle dei loro Paesi di origine. Nella quasi totalità dei bambini immigrati lo svezzamento avviene in epoche e con modalità sovrapponibili a quelle dei bambini italiani. Solo una minoranza di bambini immigrati della 2° e 3° infanzia preferisce i cibi del Paese di origine a quelli italiani, mentre la merenda a metà mattina e lo spuntino pomeridiano sono consumati più frequentemente in Italia che nel Paese di provenienza. In Italia i bambini immigrati consumano meno spesso che nel Paese di origine: the, uova, pesce, verdure, legumi e frutta secca, e più spesso pane, pasta, fiocchi di avena. L'acquisizione da parte dei bambini immigrati delle

abitudini alimentari italiane appare correlata all'essere nato in Italia e/o all'aver raggiunto i propri genitori in Italia da più di 4 anni. Anche le famiglie immigrate tendono ad assimilare le abitudini alimentari italiane.

Conclusioni. *Lo studio suggerisce che i bambini stranieri e le loro famiglie stanno acquisendo le abitudini alimentari italiane. Poiché le abitudini alimentari del mondo occidentale possono essere correlate a diversi stati morbosi dell'infanzia e delle età successive, i pediatri devono prestare la massima attenzione ai comportamenti alimentari dei bambini immigrati.*

In the last 25 years the migratory flow from developing countries towards Italy has progressively increased; today a large part of immigrant adults living in Italy is not illegal, but is regularly employed and married. The direct consequence has been an increase in both infants born in Italy to immigrant parents, and children who have come from their native countries to join their families. Immigrant children living in Italy were 125,000 in 1996, 284,000 in 2001 and 491,000 in 2004, amounting to 4% of the entire Italian paediatric population¹.

Newly immigrant families live according to the traditions and cultures of their native countries – in most cases developing countries – which leads to problems concerning the integration with the Italian native population. From this point of view, dietary habits are peculiar because they are strictly connected with the cultures, traditions and religions of each ethnic group and, thus, strongly linked with their own origins².

Our knowledge about the early feeding practices of immigrant children (rates and duration of breastfeeding, age and manner of weaning), as well as their dietary habits are limited to restricted ethnic groups³⁻⁷. Hence, we do not know whether immigrant children tend to adopt Italian dietary habits or, instead, they tend to preserve their native dietary customs.

The aims of this multicentre study, carried out by the Gruppo di Lavoro Nazionale per il Bambino Immigrato (GLNBI), affiliated to the Italian Society of Paediatric (SIP), were to investigate the dietary habits of immigrant children and their families who have come to Italy from developing countries, and to look for some demographic and socio-cultural factors able to influence them.

Materials and methods

This multicentre and cross-sectional study was carried out from Jan. 1st, 2003 to Dec. 31st, 2004; it involved Pediatric University Departments, Pediatric wards of Public Hospitals, paediatricians working for the Italian National Health System and schools. This study was carried out in the following cities: Ancona, Bassano del Grappa (Vicenza), Catania, Lucca, Mazara del Vallo (Trapani), Modena, Napoli, Novara, Palermo, Vicenza. The same predefined, standardized and structured questionnaire was administered by one of the researchers, who interviewed face-to-face the mothers of

1284 immigrant children. The questionnaires were then sent to a coordinator (F.C., Palermo) who collected them in a central register.

The questionnaire consisted of three sections (A, B and C). Section A retrospectively inquired on the children's age, gender and country of birth, their parents' native country, year of arrival to Italy, employment (regular, irregular, no employment) and education levels. Parents education levels were classified as graduate diploma, post-secondary (except university) diploma, secondary school diploma, primary school diploma, illiterate.

Information on early dietary habits [initiation and duration of breastfeeding, complementary breastfeeding, bottle-feeding (formula-feeding or pasteurized cow milk), age and manner of weaning] were retrospectively collected in section B. In agreement with the World Health Organization classification, milk feeding practices were defined as following: 1) exclusive breastfeeding (infants receiving breastfeeding only); 2) complementary breastfeeding (infants receiving breast milk together with formula or pasteurized cow milk); 3) breastfeeding (infants receiving breast milk, both exclusively breastfeeding and complementary breastfeeding); 4) no breastfeeding (infant received formula or pasteurized cow milk only). We were unable to collect data on breast feeding "at birth" (whether the mother had started breastfeeding within 48 hours after delivery) and "at hospital discharge" (type of milk-feeding during the 24 hours before hospital discharge) because many mothers did not remember this information. Therefore the collection of these last data could not be fully objective and we preferred to refer to milk-feeding practices only starting from the first completed month. Weaning was defined as the introduction of solid foods, categorized as follows: fruit, vegetables, pulses (peas, beans, chickpeas, lentils) food puree, cereals, meat, fish, cheese, eggs.

Section C collected information on dietary habits in preschool and school age immigrant children (foods more commonly consumed in Italy and in their native countries, preference for Italian or native foods, habit of having morning or afternoon snacks), as well as dietary habits that immigrant families had in their native countries and the ones they adopted in Italy (main meal in Italy and in the native countries, time spent for its preparation, tendency to consume native foods in Italy, difficulties in finding the native foods in Italy). Comparisons were performed between dietary habits in Italy

and in their native countries. Statistical analyses were carried out with the SPSS program using the Chi-square test with Yates' correction and Fisher's exact test. Two-tailed *p* value < 0.05 was accepted as statistically significant.

On the whole, the study involved 1.284 children and their immigrant families. Less than half the mothers (*n* = 517) only provided information on the early dietary habits of their infants, 655 mothers only on the dietary habits of their preschool and school aged children, and 112 mothers provided information on both the dietary habits of their infants and their preschool and school aged children. Thus, 629 mothers provided information on the early dietary habits (milk feeding and weaning) of their infants and 767 mothers on the dietary habits of children older than 2 years. The children and their families came from the following geographical areas: North Africa (561; 44%), Sub-Saharan Africa (195; 15%), South India (169; 13%), Eastern Europe (166; 13%), Far East (110; 9%), Latin America (52; 4%), Middle East (31; 2%).

Results

SOCIO-DEMOGRAPHIC CHARACTERISTICS

Most of the fathers (1136/1284, 88.5%) were regularly employed; 92 (7%) of them were graduates, 402 (31%) had a post-secondary diploma, 786 (61%) had attended the first 3 years of secondary school and only 4/1284 (0.3%) were illiterate. As to the 1248 mothers, 492 (38%) were employed (357/492, 73% a regular job and 135/492, 27% an irregular job); 75 (6%) were graduate, 418 (32%) had a post-secondary diploma, 767 (60%) had attended the first 3 years of secondary school and only 24 (2%) were illiterate. The mother's median age was 31.5 years.

Only 61/1284 (5%) fathers and 180/1284 (14%) mothers had been living in Italy for less than 4 years. More than the 50% of the immigrant children (858/1284, 67%) was born in Italy and 319/1284 (25%) had joined their parents from their native country more than 4 years before. Only 107/1284 (8%) immigrant children had joined their parents in Italy less than 3 years before.

MILK-FEEDING PRACTICES

Table I shows rates and duration of milk-feeding practices from the 1st to the 24th month of life in immigrant infants.

A comparison with recent studies in Italy⁸⁻¹⁰ shows that frequencies and duration of exclusive breastfeeding starting the first month of life were higher among immigrant infants than Italian ones. These findings are more evident in ethnic groups from North Africa, Sub-Saharan Africa and South India: at 12, 18 and 24 months of life respectively 24/148 (16%), 13/83 (16%) and 5/48 (10%) infants of the first ethnic group, 19/104 (18%), 8/54 (15%) and 6/54 (11%) infants of the second ethnic group, as well as 39/161 (24%), 18/78 (23%) and 8/54 (15%) infants of the third ethnic group had been exclusively breast-fed. On the basis of recent investigations also complementary breastfeeding is more common and prolonged among immigrant infants compared with Italian ones⁸⁻¹⁰.

On the other hand, as Table I shows, formula and/or pasteurised cow milk are exclusively used since the early months of life in several immigrant infants, and cow milk, both as complementary breastfeeding or as exclusive bottle-feeding, is commonly given to several immigrant infants before the 12th month of life.

WEANING

Table II shows that most of the immigrant infants begin to be weaned at an early age; Table III reports the age at which wheat, rice, maize, rye, barley and oat, are in-

Tab. I. Rates of exclusive, complementary and no breastfeeding (formula or pasteurised milk) in immigrant infants.

| | Exclusive breastfeeding | | Complementary breastfeeding (breastfeeding and formula) | | Complementary breastfeeding (breastfeeding and pasteurised cow milk) | | Formula | | Pasteurised cow milk | |
|-----------|-------------------------|------|---|------|--|------|---------|------|----------------------|------|
| | n | % | n | % | n | % | n | % | n | % |
| 1 month | 377 | 59.9 | 72 | 11.5 | 8 | 1.3 | 164 | 26 | 8 | 1.3 |
| 2 months | 360 | 57.2 | 78 | 12.4 | 8 | 1.3 | 175 | 27.8 | 8 | 1.3 |
| 3 months | 326 | 51.8 | 97 | 15.4 | 7 | 1.1 | 188 | 29.9 | 11 | 1.8 |
| 4 months | 285 | 45.3 | 103 | 16.4 | 16 | 2.5 | 200 | 31.8 | 25 | 4 |
| 5 months | 245 | 39 | 97 | 15.5 | 33 | 5.2 | 209 | 33.2 | 45 | 7.1 |
| 6 months | 204 | 32.4 | 82 | 13 | 52 | 8.3 | 222 | 35.3 | 69 | 11 |
| 9 months | 138 | 21.9 | 73 | 11.6 | 55 | 8.7 | 233 | 37.1 | 130 | 20.7 |
| 12 months | 93 | 14.8 | 25 | 4 | 73 | 11.6 | 213 | 33.9 | 225 | 35.7 |
| 18 months | 44 | 6.9 | 25 | 4 | 70 | 11.2 | 71 | 11.3 | 419 | 66.6 |
| 24 months | 19 | 3 | 21 | 3.4 | 69 | 11 | 54 | 8.6 | 466 | 74 |

roduced, and Table IV when immigrant infants are first given baby foods, meat, fish, eggs, cheese, pulses, vegetables and fruits. Weaning is always practised with the fresh or packaged foods available in Italy, never with foods coming from the immigrants' native countries, and age of weaning is not related with ethnic groups. Similarly to Italian infants⁹, gluten containing cereals (wheat, rye and barley) are introduced early, in some immigrant infants as early 2 or 3 months old and in most of them between the 4th and the 6th month of age. Sometimes (11% of cases) meat, fish and eggs are also introduced early (age 2-3 months).

DIETARY HABITS IN PRESCHOOL AND SCHOOL AGE IMMIGRANT CHILDREN AND THEIR FAMILIES

Most immigrant children like both Italian food and food from their native countries (445/767; 58%) whereas a smaller percentage prefers Italian foods (207/767;

27%). Instead, only a minority of them (115/767; 15%; $p < 0.0001$) prefer foods from their native countries to Italian ones. These differences are not related to ethnic group of origin.

Immigrant children usually have morning snacks more frequently in Italy (714/767; 93%; $p < 0.0001$) than in their native countries (663/767; 86%). Likewise, the afternoon snack is more frequent in Italy (721/767; 94%) than in native countries (669/767; 87%; $p < 0.0001$), without differences between ethnic groups.

Table VI compares the rates of immigrant children who consume the more commonly used foods in Italy and in their native countries. In Italy they eat less tea, eggs, fish, vegetables, pulses (beans, chickpeas, lentils) and dried fruits, and eat more pasta, bread and oat flakes, without any distinction between the different ethnic group of origin.

The main meal for an immigrant family is lunch both in Italy (775/1284; 60%) and in our immigrants' native countries (787/1284; 61%). However, the time spent for its preparation in Italy (less than 1 h in 67% families, 1-2 h or more in 33% families) is less than the time spent in the native countries (less than 1 h in the 50% families and 1-2 h or more in 50% families). Here again, there are no differences between ethnic groups. In our sample, 444/1284 (35%) families "always" eat foods from their native countries in Italy, 670/1284 (52%) "whenever possible", and 170/1284 (13%)

Tab. II. Age at start of weaning among immigrant infants.

| | |
|--|-----------------|
| 2 nd -3 rd month | 63/629 (10%) |
| 4 th -6 th month | 358/629 (56.9%) |
| 7 th -9 th month | 49/629 (7.8%) |
| 10 th -12 th month | 137/629 (21.8%) |
| 13 th -18 th month | 22/629 (3.5%) |

Tab. III. Age at introduction of cereals in immigrant infants.

| | Wheat | | Rice | | Maize | | Rye | | Barley | | Oat | |
|--------------|-------|------|------|------|-------|------|-----|------|--------|------|-----|------|
| | n | % | n | % | n | % | n | % | n | % | n | % |
| 2 months | 5 | 0.8 | 17 | 2.7 | 6 | 0.9 | 27 | 4.2 | 17 | 2.7 | 5 | 0.8 |
| 3 months | 21 | 3.3 | 28 | 4.4 | 10 | 1.6 | 29 | 4.6 | 21 | 3.3 | 28 | 4.5 |
| 4 months | 166 | 26.4 | 166 | 26.4 | 121 | 19.2 | 59 | 6.4 | 59 | 9.4 | 68 | 8.5 |
| 5 months | 94 | 15 | 93 | 14.8 | 81 | 13 | 107 | 17 | 64 | 10.2 | 77 | 12.2 |
| 6 months | 154 | 24.5 | 113 | 17.8 | 157 | 25 | 127 | 20.1 | 122 | 19.4 | 133 | 21.1 |
| 7-9 months | 115 | 18.3 | 87 | 13.8 | 64 | 10.2 | 87 | 13.9 | 116 | 18.4 | 106 | 16.9 |
| 10-12 months | 30 | 4.8 | 64 | 10.1 | 53 | 8.3 | 48 | 7.7 | 41 | 6.5 | 44 | 7 |
| > 12 months | 44 | 7 | 62 | 9.8 | 137 | 21.8 | 145 | 23 | 189 | 29.8 | 169 | 26.8 |

Tab. IV. Age at introduction of meat, fish, egg, cheese, pulses, vegetable and fruits based food puree in immigrant infants.

| | Food purees | | Fresh Meat | | Fresh fish | | Eggs | | Cheeses | | Pulses | | Vegetables | | Fresh Fruits | |
|--------------|-------------|------|------------|------|------------|------|------|------|---------|------|--------|------|------------|------|--------------|------|
| | n | % | n | % | n | % | n | % | n | % | n | % | n | % | n | % |
| 2 months | 10 | 0.3 | 24 | 0.6 | 3 | 0.4 | 3 | 0.4 | 4 | 0.5 | 5 | 0.8 | 5 | 0.8 | 16 | 2.5 |
| 3 months | 21 | 3.3 | 11 | 1.7 | 13 | 2.1 | 13 | 2 | 15 | 2.4 | 9 | 1.4 | 18 | 2.9 | 20 | 3.2 |
| 4 months | 94 | 15 | 32 | 5 | 20 | 3.2 | 16 | 2.5 | 42 | 6.7 | 39 | 6.2 | 84 | 13.3 | 150 | 23.8 |
| 5 months | 116 | 18.4 | 50 | 7.9 | 46 | 7.3 | 8 | 1.3 | 102 | 16 | 32 | 5 | 140 | 22.2 | 174 | 27.7 |
| 6 months | 212 | 33.8 | 94 | 14.9 | 108 | 17.2 | 79 | 12.6 | 169 | 27 | 81 | 12.9 | 147 | 23.4 | 95 | 15.2 |
| 7-9 months | 98 | 15.6 | 157 | 25 | 192 | 30.5 | 176 | 28 | 132 | 21 | 234 | 37.2 | 107 | 17 | 84 | 13.4 |
| 10-12 months | 22 | 3.4 | 107 | 17 | 144 | 23 | 239 | 38 | 87 | 13.6 | 103 | 16.4 | 81 | 13 | 43 | 6.9 |
| > 12 months | 59 | 9.4 | 176 | 28 | 103 | 16.3 | 95 | 15.1 | 78 | 12.4 | 126 | 20 | 48 | 7.7 | 47 | 7.4 |

Tab. V. Rates of food intake in native country vs. Italy.

| | ALWAYS/OFTEN | SELDOM/NEVER |
|------------------------|-----------------------|--------------|
| MILK | | |
| Native country | 82.7% | 17.3% |
| Italy | 84.2% | 15.8% |
| TEA | | |
| Native country | 69.9% * | 30.1% |
| Italy | 57.7% ** | 42.3% |
| MILK AND COFFEE | | |
| Native country | 41.5% ^{ooo} | 58.5% |
| Italy | 36.1% ^{oooo} | 63.8% |
| BISCUITS | | |
| Native country | 83% | 17% |
| Italy | 86.1% | 13.9% |
| BREAD | | |
| Native country | 76.7% * | 23.3% |
| Italy | 87.8% ** | 12.2% |
| OAT FLAKES | | |
| Native country | 39.2% ± | 60.8% |
| Italy | 47.5% ±± | 52.5% |
| JAM | | |
| Native country | 52.7% | 47.3% |
| Italy | 47.7% | 52.3% |
| PASTA | | |
| Native country | 60.2% * | 39.8% |
| Italy | 82.2% ** | 17.8% |
| RICE | | |
| Native country | 79.5% | 20.5% |
| Italy | 79.3 | 20.7% |
| MEAT | | |
| Native country | 88.7% | 11.3% |
| Italy | 86.9% | 13.1% |
| FISH | | |
| Native country | 80.9% ^o | 19.1% |
| Italy | 73.2% ^{oo} | 26.8% |
| EGGS | | |
| Native country | 79.5% *** | 20.5% |
| Italy | 72.8% **** | 27.2% |
| CHEESES | | |
| Native country | 64.1% | 35.9% |
| Italy | 67.9% | 32.1% |
| VEGETABLES | | |
| Native country | 75.5% ^{ooo} | 24.5% |
| Italy | 70.6% ^{oooo} | 29.4% |
| BEANS | | |
| Native country | 58.9% * | 41.1% |
| Italy | 48.8% ** | 51.2% |
| PEAS | | |
| Native country | 54.6% | 45.4% |
| Italy | 52.1% | 47.9% |
| CHICKPEAS | | |
| Native country | 45.1% + | 54.9% |
| Italy | 37.9% ** | 62.1% |
| LENTILS | | |
| Native country | 52.4% + | 47.6% |
| Italy | 45.1% ** | 54.9% |
| FRESH FRUITS | | |
| Native country | 88.9% | 11.1% |
| Italy | 92/2% | 7.8% |
| DRIED FRUITS | | |
| Native country | 47.1% *** | 52.9% |
| Italy | 41.3% **** | 58.7% |

* vs. ** p < 0.0001; o vs. oo p < 0.0003; *** vs. **** p < 0.002; ooo vs. oooo p < 0.03; + vs. ++ p < 0.004; +++ vs. ++++ p < 0.02; ± vs. ±± p < 0.001

“rarely or almost never”. Difficulties in following dietary habits of native countries are more often related to the “unavailability of ingredients and foods in Italy” (415/1284 families; 32%), the “excessive time needed to prepare those meals” (389/1284; 30%) and the “lack of space and equipment” (137/1284; 11%). Only in a few cases (126/1284; 10%) do immigrant families buy foods imported from their native countries, while more frequently they buy foods in Italian shops (673/1284; 52%) or in shops specialized in exotic foods (247/1284; 36%). The Asian ethnic group (South India and Far East: 147/279; 53%) uses exotic shops specialized in foods from native countries more than the other ones.

Discussion

The transition of Italy into a multiethnic and multicultural society prompts us to study the dietary habits of children who migrate to Italy from developing countries with their families.

Our study was cross-sectional and retrospective, not longitudinal and prospective. In addition, the subjects examined are not representative of the overall population of immigrant children living in Italy, but only of the children of regular immigrants, thus excluding all illegal immigrants. Indeed, our sampling was performed in Public Hospitals, schools and through paediatricians working for the National Health System, to which only immigrants with regular residence permits have access. Therefore, our findings must be considered with caution because there may have been a selection bias, which from an epidemiological perspective would be a limitation. Nevertheless, our study is the first performed in Italy by means of a standardized and homogeneous questionnaire on a large sample (1284 immigrant families), covering the different geographical areas of our country. So, it should be likely representative of the dietary habits of immigrant children and their families in Italy, and could likely represent an essential premise for every future intervention aiming to integrate different dietary customs and traditions.

Breastfeeding is the best milk feeding practice during the first year of life: international guidelines¹¹⁻¹³ establish exclusive breastfeeding during the first six months of life and recommend the maintenance of breastfeeding through the weaning period all through the first year of life. Frequencies and duration of breastfeeding have increased during the last decades both in Italy⁸⁻¹⁰ and in many industrialized country^{11 14-17}, but still remain below the levels recommended by international guidelines. On the other hand, in the developing countries from where the immigrant populations we studied come from, exclusive breastfeeding is the rule and usually lasts until age 12-18 months, and in some ethnic groups for the whole 2nd year of life¹⁸⁻²¹.

Although it may be difficult to compare rates of milk-feeding practices among studies employing different

methods of sampling and data collection, our investigation shows that breastfeeding (both exclusive and/or complementary) is more common and protracted in immigrant infants than in Italian ones^{8,9}. Nevertheless, immigrant infants are breastfed less frequently and for lesser months than infants who live in the immigrants' native countries¹⁸⁻²¹. Moreover a relevant percentage of them, similarly to several Italian infants^{8,9}, is given pasteurised cow milk during the first 12 months of life. These findings appear contrasting but must be put in relation with the different demographic and socio-cultural factors able to differently influence milk feeding practices. Indeed, the income of the immigrant families examined is satisfactory because most fathers are regularly employed and in many cases the mother also works. In addition, the mothers' median age is high, and the education level in immigrant parents is good and, on average, higher than in the Italian families¹. These conditions are known to encourage breastfeeding^{15 17 22 23} and, together with the desire of many immigrant mothers to preserve their native countries' traditions, they explain why the frequency and duration of breastfeeding are higher among immigrant infants than Italian ones.

On the other hand, the years spent in Italy by the parents more than 4 years in most of them, the lack of the cultural and psychological supports of the *enlarged* family from the native country (in developing countries, after the delivery, mothers usually go back for 4-6 weeks to their paternal families where they only devote time to breastfeeding, with the help of the older women of the family¹⁹), the need for many immigrant mothers to go back to work, the wrong idea of many immigrant parents that formula and pasteurised cow milk are better than breastfeeding²⁴, and the high frequency of hospital admissions among immigrant newborns²⁵ are important socio-cultural risk factors^{15 17 22 23 26-28} that explain why among immigrant infants breastfeeding is less frequent and less prolonged than in their native countries. However, because long-term breastfeeding has advantages for infants living in affluent countries (it prevents acute gastrointestinal infections as well as allergic respiratory and gastrointestinal diseases early in life, and reduces the risk of certain chronic diseases such as obesity, diabetes mellitus, cardiovascular diseases, etc. in adult life), immigrant mothers should have no reason for not breastfeeding their babies. Therefore, Italian paediatricians should be aware of this topic because the number of immigrant children permanently living in Italy are quickly increasing.

Age and mode of weaning appear more indicative than milk feeding practices, that immigrant infants have a tendency to conform their early dietary habits to Italian ones. Indeed, the subjects studied were almost always weaned earlier compared to the infants living in their native countries^{18 20 21 24 29 30}, and similar (between the 4th and the 6th month) to Italian infants⁹. Moreover, weaning is always practised with the fresh or packaged foods available in Italy, never

with foods coming from the immigrants' native countries. These findings, in accordance with previous studies^{28 31-33}, might likely be related to the length of the parents' stay in Italy (more than 4 years in most of them), which favours the acquisition of lifestyles typical of industrialized countries, including early dietary habits. In particular, it is noteworthy for its relation with celiac disease^{34 35} that immigrant infants, similarly to Italian ones, start consuming gluten containing cereals at very early ages.

Our study shows that also preschool and school age immigrant children have a tendency to adopt Italian dietary habits. Indeed, only a small percentage of them (115/767; 15%) prefers native foods to Italian ones, whereas they eat morning and afternoon snacks more often than in their native countries and similar to those usually consumed by most Italian children^{36 37}. Moreover, immigrant children in Italy consume the foods that are commonly eaten in their native countries (i.e. vegetables, pulses, tea, fish, eggs, dried fruits) less often, while they eat pasta and bread more often, resembling Italian eating habits. As shown in previous studies in other countries, where immigrants adopt different dietary habits many years after the migration as a consequence of the integration of new lifestyles³⁸⁻⁴¹, these findings might likely be related to the time spent in Italy because most of the immigrant children examined were born in Italy (858/1284; 67%) or had migrated to our country many years before (319/1284; 25% more than 4 years before). However, sharing similar dietary habits with the Italian childhood population might likely represent for immigrant children an important environmental risk factor for some chronic diseases related to Western dietary customs (especially obesity, diabetes mellitus, hypertension and other cardiovascular diseases, allergies, food intolerances). Consequently, also for these reasons, Italian paediatricians must pay great attention to the dietary habits of immigrant children.

The time that immigrant mothers spend preparing the main meal of the day (lunch) is usually less in Italy than in their native countries. This finding suggests that immigrant women follow the traditions of the host country, which places little importance on preparing meals. Moreover, only 1/3 of the immigrant families "always" consume their native foods in Italy, especially for the unavailability "of the ingredients and food" and for "the excessive time needed to prepare the meals", whereas only in a few cases (10%) do the immigrant families buy foods directly imported from their native countries. These findings show that also immigrant adults tend to adopt Italian dietary habits. It is likely that the changes we observed in immigrant families facilitate the adoption of Italian dietary habits among immigrant children because eating habits are learnt in one's own families during the early childhood. In conclusion, Italy is becoming a multiethnic country with new cultures and life styles, which include also dietary habits. Our investigation, despite its limitation, suggests that in Italy, like in other countries where im-

migration from developing countries started many years ago, immigrant infants and children have the tendency to adopt Italian dietary habits as a consequence of the natural process of integration with new cultures and life styles. Therefore, considering the recognized

association between diet in infancy and childhood with some acute and chronic diseases related to the diet of industrialized countries, our efforts should be addressed to promote correct dietary habits also among immigrant infants and children.

References

- ¹ Caritas di Roma. *Dossier Statistico immigrazione*. Roma: Edizioni Anterem 2005.
- ² Cataldo F, Presti L. *L'alimentazione infantile nelle diverse culture*. *Bambini e Nutrizione* 2002;9/4:145-9.
- ³ Assimadi JK, Atakuma Y, Ategbro S. *Tradizioni ed abitudini alimentari nel bambino immigrato e suo inserimento nella vita europea*. *Il Pediatra* 1992;35:36-9.
- ⁴ Ambruzzi AM, Morino G, Marino D. *Alimentazione nel primo anno di vita. Confronto tra due gruppi di bambini extracomunitari ed italiani*. *Bambini e Nutrizione* 1995;2:55-8.
- ⁵ Ambruzzi AM, Morino G, Lucibello M. *Inchiesta alimentare in un gruppo di bambini extracomunitari*. *Atti 49° Congresso Italiano di Pediatria*. *Rivista Italiana di Pediatria* 1993;19:265-6.
- ⁶ Quattrino P, Nosotti L, Zacchè C. *Problematiche relative al divezzamento nei bambini immigrati*. *Atti 3° Congresso Nazionale del Gruppo di lavoro Nazionale per il Bambino Immigrato*. Milano, 16-17 Maggio 2003, p. 8.
- ⁷ Bosco N, Cataldo F, Mazzarese C. *Abitudini alimentari del bambino immigrato. Indagine multicentrica in Sicilia (dati preliminari)*. *Atti 3° Congresso Nazionale del Gruppo di Lavoro Nazionale per il Bambino Immigrato*. Milano, 16-17 Maggio 2003, p. 9.
- ⁸ Giovannini M, Riva E, Banderali G, Salvioni M, Radaelli G, Agostoni C. *Breast-feeding across Geographical areas in an Italian samples of infants*. *The Italian Journal of Pediatrics* 2005;31:44-51.
- ⁹ Giovannini M, Riva E, Banderali G, Scaglioni S, Veehof SHE, Sala M, et al. *Feeding practices of infants through the first year of life in Italy*. *Acta Paed* 2004;93:492-7.
- ¹⁰ Pacchin M. *Indagine epidemiologica sulla prevalenza e la durata dell'allattamento materno nei primi 6 mesi di vita nei nati nel Veneto*. *Atti Congresso Nazionale Società Italiana Nutrizione Pediatrica*, Milano 25-28 Maggio 2000, p. 143.
- ¹¹ American Academy of Pediatrics. *Work-Group on breastfeeding. Breastfeeding and use of human milk*. *Pediatrics* 1997;100:1035-9.
- ¹² WHO Infant and young child nutrition. 54th World Health Assembly, May 14-22. WHA 54.2, Agenda item13.1. Geneva: WHO, 2001.
- ¹³ Kramer MS, Kakuma R. *Optimal duration of exclusive breast-feeding*. *Cochrane Database Syst Rev* 2002;CD003517.
- ¹⁴ Freeman V, van't Hof M, Haschke F, the Euro-Growth Study Group. *Patterns of milk and food intake in infants from birth to age of 36 months: The Euro-Growth study*. *J Pediatr Nutr* 2000;31:S76-S85.
- ¹⁵ Lande B, Andersen LF, Baerug A, Trygg Ku, Lund-Larsen K, Veierod MB, et al. *Infant feeding practices and associated factors in the first six months of life: the Norwegian Infant Nutrition Survey*. *Acta Paed* 2003;92:152-61.
- ¹⁶ Ryan AS, Wenjun Z, Acosta A. *Breastfeeding continues to increase in the new millennium*. *Pediatrics* 2002;110:1103-9.
- ¹⁷ Michaelsen KF, Larsen PS, Thomsen BL, Samuelson G. *The Copenhagen cohort study on infant nutrition and growth: duration of breastfeeding and influencing factors*. *Acta Paed* 1994;83:565-71.
- ¹⁸ Pacchin M. *Povert  e malnutrizione nei PVS. Obiettivi per lo sviluppo Atti 61° Congresso Nazionale di Pediatria, Montecatini 28 Set - 2 Ott. 2005*. *Quaderni di Pediatria* 2005;4/1:233.
- ¹⁹ Cataldo F. *Problemi alimentari del bambino immigrato. Relazione 59° Congresso Nazionale di Pediatria*. Roma: Atti del Congresso, Settembre 2003, pp. 46-49.
- ²⁰ Cataldo F, Presti L, Pitarresi N. *Le tradizioni alimentari del bambino nell'area islamica del Maghreb*. *Bambini e Nutrizione* 2003;10/2:66-70.
- ²¹ Giorgi PL. *Abitudini alimentari nel subcontinente indiano*. *Bambini e Nutrizione* 2004;11/1:32-5.
- ²² Grjibovski AM, Yngue A, Bygren LO, Sjostrom M. *Socio-demographic determinants of initiation and duration of breastfeeding in northwest Russia*. *Acta Paed* 2005;94:588-94.
- ²³ Dubois L, Girard M. *Social inequalities in infant feeding during the first year of life. The Longitudinal Study of Child Development in Quebec (LSCDQ 1988-2002)*. *Pub Health Nutr* 2003;6:773-83.
- ²⁴ Mazzetti M. *Bambini in cammino. Il dialogo transculturale in Pediatria*. Percorsi Editoriali di Carrocci Editore 2002.
- ²⁵ Bona G, Zaffaroni M, Cataldo F, Sandri F, Salvioli GP. *Infants of immigrant parents in Italy. A national multicentre case-control study*. *Pan Minerva Medica* 2001;43:155-9.
- ²⁶ Anderson AK, Damio G, Himmelgreen DA, Peng YK, Segura-Perez S, Perez-Escamilla R. *Social Capital, acculturation and breastfeeding initiation among Puerto Rican women in the United States*. *J Hum Lact* 2004;20:39-45.
- ²⁷ Umumarino M, Albano F, De Marco G, Mangani S, Aceto B, Umumarino D, et al. *Short duration of early introduction of cow's milk as a result of mothers' low level of education*. *Acta Paed* 2003;91(Suppl 441):12-7.
- ²⁸ Guendelman S, Siega-Riz AM. *Infant feeding practices and maternal dietary intake among Latino immigrants in California*. *J Immigrant Health* 2002;4:137-46.
- ²⁹ *La casa di tutti i colori. Mille modi di crescere. Bambini immigrati e sue cure*. Franco Angeli Editore 2002.
- ³⁰ Chinosi L. *Sguardi di mamma. Modalit  di crescita dell'infanzia straniera*. Franco Angeli Editore 2002.
- ³¹ Celi AC, Rich-Edwards JW, Richardson MK, Kleinman KP, Gillman MW. *Immigration, race/ethnicity and social and economic factors as predictors of breastfeeding initiation*. *Arch Pediatr Adolesc Med* 2005;159:255-60.
- ³² Byrd TL, Balcazar H, Hummer RA. *Acculturation and breastfeeding intention and practice in Hispanic women on the US-Mexico border*. *Ethn Dis* 2001;11:72-9.
- ³³ Rassin DK, Markides KS, Baranowski T, Richardson CJ, Mikut WD, Winkler BA. *Acculturation and the initiation of breast feeding on the United States-Mexico border*. *Am J Med Sci* 1993;36:28-34.
- ³⁴ Cataldo F, Pitarresi N, Accomando S, Greco L. *Epidemiological and clinical features in immigrant children with coeliac disease*. *Dig Liv Dis* 2004;36:722-9.
- ³⁵ Cataldo F, Accomando S, Fragapane ML, Montaperto D, and SIGENP and GLBNI Working Groups on food intolerances. *Are food intolerances and allergies increasing in immigrant children coming from developing countries?* *Pediatric Allergy Immunology* 2006;17:364-9.
- ³⁶ Scaglioni S, De Notaris R, Radice N. *Alimentazione in et *

- prescolare e scolare, tra realtà e raccomandazioni.* In: Collana monografica della Società Italiana di Pediatria, Nutrizione in età evolutiva 1999, pp. 101-106.
- ³⁷ Faldella G, Galletti S. *Alimentazione dell'adolescente.* Bambini e Nutrizione 2003;10:77-82.
- ³⁸ Gordon-Larsen P, Harris KM, Ward DS, Popkin BM. *Acculturation and overweight-related behaviours among Hispanic immigrant to the US: the National Longitudinal Study of Adolescent Health.* Soc Sci 2003;2023-34.
- ³⁹ Darmon N, Khlat M. *An overview of the health status of migrants in France, in relation to their dietary practices.* Pub Health Nutrition 2001;4:163-72.
- ⁴⁰ Gary TL, Baptiste-Roberts K, Gregg EW, Williams DE, Beckles GL, Miller EJ^{3rd}, et al. *Fruit, vegetable and fat intake in a population-based sample of African Americans.* J Natl Med Assoc 2004;96:1599-605.
- ⁴¹ Neuhouser ML, Thompson B, Coronado GD, Solomon CC. *Higher fat intake and lower fruit and vegetables intakes are associated with greater acculturation among Mexicans living in Washington State.* J Amer Diet Assoc 2004;104:51-7.

Appendix – GLNBI members: Ancona (O. Gabrielli), ACP, Bassano del Grappa (P. Bonin, T. Centomo, M. Finco, R. Scala), Catania (A. Fonti, S. Musumeci), Lucca (M. Montesanti), Mazara del Vallo (G. Lipari, M.G. Quinci), Modena (M. Prodi), Napoli (L. Di Martino, B. Quarto, L. Martemucci), Novara (G. Bona, D. Avanzo, S. Savastio, M. Zaffaroni), Palermo (A. Colajanni, F. Di Piazza, M.L. Fragapane, M. Grillo, D.C. Mazzaresse, F. Meli), Montaperto (G. Scaffidi, D. Varrica)