

Driving Women's Breastfeeding and the Introduction of Complementary Feeding in the Region of Casablanca (Morocco)

Mouna Habibi^{a, f}, Mohammed Amine Radouani^a, Zineb Serhier^b, Loubna Doukkali^a, Abdelhak Abkari^c, Mustapha Mrabet^a, Aguenou Hassan^d, Amina Barkat^{a, e}

Abstract

Background: Dietary diversification is a sensitive period in the construction of the child's autonomy. Broadening the child's food repertoire is based on complex forms of learning. This research project aimed at exploring mothers' perceptions with reference to the introduction of appropriate and timely complementary feeding.

Methods: This was a cross-sectional study with prospective data collection, based on semi-structured individual interviews, conducted from April 1 to December 30, 2015. The study included 574 mothers with children aged 0 - 24 months, who attended 12 health centers within the prefecture of Ain Chock in Casablanca, Morocco.

Results: Of all the included mothers, 84.6% with children under 6 months of age reported receiving little or no explanation about managing complementary feeding and 93.0% did not receive breastfeeding counseling services from health professionals. For mothers whose children were aged 6 - 24 months, 74.6% of them reported not having been enlightened on the subject of dietary diversification.

Conclusion: Counseling is an enabling process with a strong educational component built within it. The community-based interventions for improving breastfeeding and complementary feeding practices, through appropriate awareness-raising campaigns, training and education programmes responding to the information needs of parents and caregivers, need to be further reinforced.

Keywords: Breastfeeding; Complementary feeding; Diversified diet; Infant feeding; Malnutrition; Counseling; Knowledge; Attitudes; Behaviors; Promotion

Introduction

The food diversification in a child's life is a fundamentally important phase of physiological, sensory adaptation and psychoaffective that is expected to be able to contribute towards a successful transition to a self-feeding that guarantees omnivorous diet requirements. The diversification occurs within a certain time period where the food intake and environmental factors have a huge impact on human health over the long term by the so-called "programming" mechanisms [1].

Between 0 and 36 months of age, children need to learn how to make the best nutritional choices and form good eating habits to carry them through their lives in order to avoid eating disorders, such as the development of childhood obesity, that are on the rise with potentially serious consequences. But, at this age, the child is obviously not the primary carer of his nutritional selections with a total dependency on those around him [2].

For the World Health Organization (WHO), it is about the introduction of any food other than the maternal milk, with the exception of vitamin D supplements, vitamins and minerals supplements, drinking water and oral rehydration solution (ORS) that are not recommended for breastfed newborns. It is also the first step of the child towards the adult world. It is a process that enables the psychomotor, neurological, and cognitive child's development to occur [1, 3].

Every child, from every culture and origin, has to go through an adaptation phase that has its share of difficulties and obstacles. The methods of introduction of a diversified and nutritious diet for children varied over time influenced by the sociocultural and economic conditions, the family food habits, or the fashions [1, 4]. The food consumptions of the children are widely guided by the diversity of their food preferences which would result partially from the variability of taste preferences, that is the preferences for the sweet, salty, acid, bitter flavors and umami flavor that can make ingredients more appetizing without destroying their original flavor. Within a few hours of delivery, the newborn child expresses, by the use of gesture or mime's pleasure, his attraction for a sweet solution.

Manuscript accepted for publication November 11, 2016

^aResearch Team on Health and Nutrition of Mother and Child, University Mohammed V, Faculty of Medicine, Rabat, Morocco

^bLaboratory for Biostatistics and Clinical and Epidemiological Research, Faculty of Medicine and Pharmacy, Casablanca, Morocco

^cPediatrics III, Children's Hospital, Ibn Rochd Teaching Hospital, University of Hassan II - Ain Chock, Faculty of Medicine, Casablanca, Morocco

^dUnite Mixte de Recherche en Nutrition et Alimentation URAC 39, University Ibn Tofail-CNESTEN; RDC-Nutrition AFRA/AIEA, Morocco

^eThe Department for Children V, National Reference Center for Neonatology and Nutrition, Children's Hospital, Ibn Sina University Hospital Centre, Rabat, Morocco

^fCorresponding Author: Mouna Habibi, Research Team on Health and Nutrition of Mother and Child, University Mohammed V, Faculty of Medicine, Rabat, Morocco. Email: mouna.habibi@um5s.net.ma

doi: <https://doi.org/10.14740/jcgo420e>

Table 1. Characteristics of the Studied Population

	Population size	Percentage (%)
Child's age		
≤ 6 months	140	24.4
> 6 months	434	75.6
Child's sex (female)	273	47.6
Health insurance scheme		
AMO	21	3.7
RAMED	74	12.9
CNOPS	44	9.2
CNSS	108	18.8
Others	45	7.8
None	282	47.6
Level of education among mothers		
Illiterate	106	18.5
Koranic school	3	0.5
Primary level	126	22.0
Secondary level	250	43.6
University level	89	15.5

This attraction for the sugar water tends to gradually smoothen in the first year and its adaptability is essential to the acceptance of the maternal milk which is sweetened. As of this period of dietary variety, mothers must stimulate the child's taste. Good practices help to teach an infant that tastes other than sweet breast milk are good to eat. Beyond the changes of gustative reactivity during the development, the food experiences give nuance to the taste and food preferences, particularly during the first few months of life [5].

The past years have seen greater advances in the nutritional knowledge. Dietary diversity and child nutrition are seen as major issues by the parents [6]. In Morocco, researchers have nonetheless observed some worrisome tendencies with regard to nutrition and care of infants and young children, including breastfeeding, complementary feeding. Breastfeeding indicators for infants less than 4 months old recorded a downward trend, the use of the feeding-bottle became common, the marketing of breast milk substitutes has increased and the complementary feeding, although relatively diversified, is still often introduced prematurely or at a very late stage [7, 8].

This study aimed at analyzing mothers' perceptions and practices with reference to the introduction of appropriate and timely complementary feeding. Additionally, we would like to emphasize on the major point that the nutritional education should be promoted and encouraged. It increases awareness among mothers of the importance of breastfeeding, providing a varied diet.

Population and Methods

This was a cross-sectional study with prospective data collection, based on semi-structured individual interviews conduct-

ed from April 1 to December 30, 2015. The population of the study included the mothers of infants aged 0 - 24 months, primiparous or not, who attended the 12 health centers within the health delegation of Ain Chock, one of the prefectures districts of Casablanca. The 12 health centers are in an urban environment (health centers: Panoramic, Laayoune, Derb El Khayr, Ennour, Dakhla, Adarissa, Sidi Maarouf, Mkanssa, Sidi Mes-soud, Mostakbal, Les Cretes, and Chrifa).

We did not fix age limits to identify the representations of minor and major women. We grouped women's panel of various social backgrounds.

The data collection was realized by means of a structured interview based on a beforehand tested questionnaire and administered to the mothers.

The questionnaire explores the following dimensions: the socioeconomic and demographic profile of the mothers: age, urban or rural origin, academic level, profession, parity and age of the last child; the characteristics of the pregnancy and the childbirth: follow-up and possible complications; the knowledge and the practices of the mothers concerning the food diversification and the infantile dietetics.

The participation was voluntary and the referees could refuse at any time to answer a question. All the interviews were realized in the center of health directly after a consultation of follow-up. The duration of the interviews oscillated between 15 and 50 min. Notes were taken during the maintenance to hold the important ideas and clarify certain words. The set of the interviews was led by means of a guide of maintenance divided into two blocks of questions concerning the following themes: the first block concerned the maternal and sociodemographic characteristics. The second block approached the food diversification, with the knowledge and the representations as

Table 2. Family History of Atopy

Family history of atopy	Percentage (%)
Atopy	52.6
Allergic rhinitis	30.1
Parental asthma	26.8
Allergic conjunctivitis	15.4
Eczema	8.8
Gastrointestinal food allergies	8.5
Relatives	
Mother	47.4
Father	35.7
Siblings	29

well as on the mode of diversification.

All statistical analyses were performed in SPSS 16.0. The comparisons were performed using appropriate statistical tests (Pearson's Chi-squared test (χ^2) and Fisher's exact test). For each statistical procedure, a threshold of significance of 0.05 was used.

Results

Socio-epidemiological characteristics of the studied population

We have included 574 mothers, resident in urban surroundings, in the present analysis. The average age of infants is 7 months, which extremes from 3 to 24 months. The newborn population being studied is predominantly male (52.4%).

The children were individualized in two groups in accordance with their age: the first group of 140 infants aged under 6 months (24.4%) and the second group consisting of 434 children from 6 months of age (75.6%) at the time of the survey. Of the included mothers, 47.6% were not covered by any National Health Insurance Scheme. Of the women, 43.6% attended secondary education, 22% attended primary school, 18.5% were illiterates, 15.5% joined a higher level of education in a university, 0.5% have been to Koranic school, and 86.9% were stay-at-home mothers. Parents who have never attended any school or who have attended Koranic and primary schools are considered to have a low level of education. Medium and high levels of education corresponded, respectively, to secondary education and higher education. And 60.8% of the mothers were primipara (Table 1).

The average age of mothers was 29.77 ± 6.7 years. Of the mothers, 57.0% were of low socioeconomic level with a monthly income less than 3,000 dirhams.

Family history of atopy

Of the children, 52.6% had family history of atopy (parental asthma (26.8%), eczema (8.8%), allergic rhinitis (30.1%), allergic

conjunctivitis (15.4%), and gastrointestinal food allergies (8.5%), among fathers and mothers or the siblings (mother (47.4%) and father (35.7%) and among siblings (29%)) (Table 2).

Accessibility to basic health care

The access to the primary health care is determined by numerous factors of diverse natures, such as the distance, the geography, the education, the socioeconomic and cultural level, and the place of residence. It is especially estimated by the health coverage.

The role of the network of the establishments of primary health care is major in the sectorial strategy of the Moroccan Ministry of Health: it constitutes the entry point of the system of care, and is the instrument of prevention, reference and epidemiological supervision.

For the monthly income, according to a study conducted in 2007 by le Haut Commissariat au Plan of Morocco (economic planning) [9], the level is low when the salary earned is inferior to 3,000 dirhams and it increases when the level is average.

The accessibility to basic health care remains easy for about 66.8% of the population living unless 6 km of the nearest establishment of primary health care, what represents often less than 20 min of walking for 58.9% of the studied population (Table 3).

Attitude and practices of complementary feeding by mothers

Of the mothers, 58.1% planned to start the diversification when the child reaches the age of 6 months; 93.0% received no information on breastfeeding during the day, among which 75.8% breastfed their children every time they demanded it; 97.4% benefited from no identification of the practical problems of the infant feeding; 84.2% benefited from no visit of necessary follow-up; and 97.8% had no idea on the frequency of feeding overnight.

For children aged from 6 to 24 months, 64.8% of women diversified at the age of 6 months (extremes from 1 to 12 months); 74.6% of them were not given any advice on improving food diversification; and 89.8% reported that there was no emphasis, given by healthworkers, to the protection, the promotion and the support of exclusive breastfeeding during the first few months of the child's life (Table 4).

Of the babies, 10% were exclusively breastfed and 90% of the infants had a mixed feeding, a part of dominant breastfeeding and a part of partial breast-feeding (Table 4).

Mother's perceptions regarding the optimal age of starting up dietary diversification

Among 559 women under study who answered the questions concerning the knowledge and the practices concerning the optimal age of adding complementary foods, 36.0% were for a starting up of the diversification well before 6 months, 62.1% expected to start the diversification at the age of 6 months and 2.0% were

Table 3. Accessibility to Health Care

	Population size	Percentage (%)
Monthly income (MAD)		
≤ 1,000	34	5.9
1,001 - 1,600	35	6.1
1,601 - 2,000	84	14.6
2,001 - 3,000	174	30.3
> 3000	247	43.0
Distance from the health facility (km)		
< 6	383	66.8
6 - 10	186	32.5
> 10	4	0.7
Means of transport		
Car, motorcycle	49	8.5
Public transport	183	31.9
Cart	4	0.7
Walking	338	58.9
Duration of the journey		
< 20 min	483	84.1
20 min - 1 h	87	15.2
> 1 h	4	0.7

beyond 6 months (extremes from 1 to 12 months) (Table 5).

Mothers' perceptions of complementary feeding suit to their actual practices, as illustrated in Table 6.

For children aged 6 months or older (Table 6), 30.4% of mothers have diversified before the age of 6 months ($n = 98$), 66.5% began diversifying at the age of 6 months ($n = 214$) and 3.1% have started beyond 6 months ($n = 10$) (Table 6).

Counseling services provided by health professionals

Of mothers, 45.6% expressed their satisfaction with the ser-

vices offered at the health facilities, and 61.5% with children less than 6 months old reported an examination period of very short duration. Of women, 55.7% reported a very short time allocated to counseling, and 84.6% of mothers did not receive any advice on complementary feeding or tips on solving common breastfeeding issues (Table 7).

We are convinced that we must strive for the overriding objective that the healthcare workers must be very vigilant to breastfeeding issues as long as it significantly influences the children's development and protection. There are many maternal factors that enable the clinician to notice many of the "red flags" that can alert him of the need for close follow-up, such

Table 4. Practice of Breastfeeding for Babies Under 6 Months

	Population size	Percentage (%)
Breast-feeding of baby ≤ 6 months		
Less than eight times	3	2.0
Breastfeed 8 or more times in 24 h	18	12.1
On the appeal by the baby	115	77.2
Who were not breastfed	13	8.7
Breast-feeding of baby > 6 months		
Less than eight times	29	7.1
Breastfeed 8 or more times in 24 h	47	11.5
On demand	325	79.3
Who were not breastfed	9	2.2

Table 5. Expected Age to Start the Diversification

Diversified diet	Size	Percentage (%)
Before 6 months	201	36.0
6 months	347	62.1
Beyond 6 months	11	2.0

as maternal issues with breasts (delay of lactogenesis, flat or retracted nipples, and cracked or bleeding nipples). By providing an individualized care and advice that is geared towards meeting the mothers's needs, the health professional will be able to enhance the confidence and skills of the mothers in taking care of their children (Table 7).

Discussion

The recommendations regarding the age of food diversification have changed over the centuries. At the beginning of 20th century, breastfeeding was the main feeding infants. Food diversification started usually after the age of 1 year. In the 1920s, publications advocated a food diversification around the age of 6 months to reduce the risk of infection and increase the nutritional intake. Until the late 20th century, the recommended age for food diversification was further advanced, sometimes before age 4 months [10-13].

In 1923, a Swedish pediatrician, Jundell, reported that the earlier practice of food diversification in an orphanage in Stockholm, around the age of 6 months, was associated with better height and weight growth of infants. The confirmation by other authors of the beneficial effect on weight gain and resistance to infection, this early diversification, led the American Medical Association to recommend in 1937. The introduction of solid foods earlier and earlier in life was reinforced by Steward, who in 1943 advised the intake of sardines, tuna or

Table 6. Effective Age of Introduction of Complementary Foods

Food diversification	Size	Percentage (%)
Before 6 months	98	30.4
6 months	214	66.5
Beyond 6 months	10	3.1

shrimp in infants 4 - 6 weeks, and even advocated by Sackett 10 years later the introduction of cereals from the second or third day of life. In the 1960s, a gradual return to a more physiological and less dogmatic approach to food diversification has been observed which nevertheless willingly began around the age of 3 months, if not sooner. This evolution was due in particular to socio-cultural reasons: stress due to women's work, earlier integration of infants in community life, desire to discover new flavors and, of course, part of more or less sustainable modes [14].

In 2003, WHO declared itself in favor of a return to the "exclusive breastfeeding for 6 months" followed by "complementary feeding from the age of 7 months with food balanced, age-appropriate, safe and properly administered, in conjunction with continued breastfeeding up to 2 years or longer depending on the child's wishes and the mother" [3, 14, 15].

These WHO recommendations are often faced with practical habits of populations. Several anthropologists have shown that no civilization has in fact adopted exclusive breastfeeding prolonged for a period of 6 months. There have always been other nutritional intakes, provided by stepmothers, siblings, and grandparents. The child's relationship with the world is thus created from the beginning, in the multiplicity and diversity. As to the learned societies of the main industrialized countries, while supporting a prolonged exclusive feeding, ideally during 6 months, they recommend actually that the diversification does not begin before 4 months, in order not to increase the risk of allergy, and not after 6 months of age [14].

Table 7. The Advice Given by Health Professionals

Different kinds of counseling	Population size	Percentage (%)
The breast-feeding baby \leq 6 months		
Breastfeeding on demand	128	22.3
Breastfeeding during the night	143	24.9
The introduction of a diversified diet	125	21.8
The breast-feeding baby $>$ 6 months		
Breastfeeding on demand	378	65.9
The introduction of a diversified diet	332	57.8
The average number of meals per day	4	0.7
Non-utilization of illustrative material	568	99.0
The identification of breastfeeding issues		
The breast-feeding baby \leq 6 months		
A failure to recognize the common breastfeeding challenges	145	25.3
The breast-feeding baby $>$ 6 months		
A failure to recognize the common breastfeeding problems	407	70.9

In 2008, the French Paediatric Society Nutrition Committee recommended that the beginning of the food diversification should take place after 6 months of age, and not after 4 months, and it can in no way be considered deleterious in the current state of knowledge and existing research capabilities. He underlined that the egg and the fish can be introduced from the end of the first half-year of life and either after 1 year, like that was traditionally recommended [16].

The recommendations of the American Academy of Pediatrics (AAP) agreed to recommend an adequate and diversified diet between 4 and 6 months, without delaying the introduction of potentially allergenic foods [17].

In 2008, the European Society for Pediatric Gastroenterology, Hepatology, and Nutrition (ESPGHAN), concerned to prevent food allergies, coeliac disease and insulin-dependent diabetes, determined a period called "window of opportunity" between 4 and 6 months, exactly between the 17th and the 24th. ESPGHAN recommendations were based on significant research resources which showed that, to induce food tolerance, it was important that infants should be put in contact with allergens at an early stage, rather than delay the introduction of potentially allergenic foods, the infant has no allergy risk or he came from a nuclear family in which one or more of the members have documented allergy [18, 19]. In our series, a family atopy (parents or siblings) (allergic rhinitis, asthma, conjunctivitis, eczema or food allergies) was found in 47.4% of cases.

Let's reiterate that early food diversification, long before the age of 6 months, was practiced around 1975 - 1980. The practice of delayed diversification, especially in the high-risk allergic infant, was recommended after the work of Fergusson and Horwood, conducted from 1981 to 1994, showing, with a decline of 10 years an increase in the frequency of atopic dermatitis 2.6 times when the introduction of solid foods was before the age of 4 months versus an introduction after this age [19].

Food diversification should be done gradually, in a pleasant way. The first learning about food diversification is facilitated by the open nature of children to new and little preset preferences. The specific terms of food introduction are not subject to any absolute scientific rule. There is no specific order and the food frequency introduction, presentation individually or in combination, are left to the arbitration of the parents. The repercussions of these practices on subsequent tastes are not yet completely identified [20].

Our study included 574 women of the Prefecture of Ain Chock in the Casablanca region bringing their children between 0 and 24 months old for consultation, vaccination, counseling or any other medical or paramedical act. The study established the prevalence of exclusive breastfeeding, the optimal age of switching from a liquid lacteal diet to solid food, approaches to counseling and practices on food diversification.

The main limitation as far as our study is concerned is the method. The interview guide was the subject of a pre-structuring; some details of the analysis were given precedence over others. The second limit of the survey is that knowledge or what can be said in the interview does not necessarily reflect the percentage of mothers using optimal practices, since it was not performed in real time and determined by the situation on the ground.

The first notable observation is that 66.5% of those interviewed began the diversification at the age of 6 months in accordance with recommendations of the French Paediatric Society Nutrition Committee. For instance, the prevalence of diversification of the food-complementation diet at the age of 6 months varies between 80% and 90% in Switzerland [21], in Italy [22] and by more than 90% in Spain [23]. Paradoxically, this prevalence in France is among the lowest in the European countries with less than 70% [24].

In the fourth edition of the only French survey, carried out every 8 years since 1981, specifically dealing with food consumption of French infants and young children conducted by the French syndicate of childhood food, in 2005, with mothers of 713 infants and young children between the ages of 0 and 36 months, it was shown that mothers should be supported imperatively to make an informed decision about infant feeding, and the medical staff is by far the largest source of advice. The general practitioner and pediatrician are fundamental pillars of the education of young women in their role as mothers and are actually recognized as such by the mothers interviewed. In terms of the other traditional sources of guidance, there is a balance between the role of the environment and the role of media. Younger mothers make more use of human scaffolding, the immediate community in which they live. As they grow older, mothers distance themselves from the influence of peers, greater autonomy within their daily lives and often they turn to the media [2]. The low internet usage in 2005 has probably grown up in households in 2016.

The French survey highlighted the fact that the mother is the main interlocutor of the child, and many things happen between her and her child at the time of diversification and the transition to the spoon. Mothers know intuitively that the first few months are critical to the development of his body and mind. They are often afraid of doing something wrong. This underlies the low percentage of mothers (15%) that rely on their own experience to feed their children and the great need for advice for 85% of mothers. Current mothers do not know the generational support (mother, grandmothers, and aunts) that our grandmothers knew because of changing social structures and the dispersal of families. They especially need help as they are primiparas and younger [2].

In our series, beliefs and practices of mothers remain weak and even erroneous. In our context, despite the fact that there is frequently an emotional and social transgenerational support but young mothers often receive false guidance related to social rituals, just as well as ethnic communities across the country which have rituals and traditions that are different from each other and from the mainstream community. This is also mirrored by the fact that an early starting up of the food diversification from the age of 3 months concerned the third of the infants at the time of the survey. The rate of timely complementary feeding remains far from adequate: only two-thirds of children age 6 months up to 9 months received a complementary feeding besides the maternal milk, according to data from a Population and Family Health Survey [24, 25].

Several recent studies came to conclusions which emphasized the importance of the role of health workers in the decision-making to breast-feed, in breastfeeding patterns, timing of complementary feeding, food quality and extensive nutritional

counseling and support. Almost none of the mothers, we talked to, gave specific pointers for behavior. Most of them supported the requirements for effective listening carefully and respectfully to their needs in order to help them take concrete actions to correct inappropriate practices: “Nobody bothered to find out what are my needs and my expectations to gain a better understanding of knowledge gaps that might threaten the health and well-being of my children”.

In our survey, approximately all women, although eager to breastfeed and wishing to provide some kind of healthy environment for their children, may be skeptical about their ability to properly feed their infants and claim that health professionals did not ensure that mothers are given all relevant information, for optimizing infant feeding practices and combating protein and energy malnutrition, that may improve the quality of care and make it more child friendly. In their respective declarations, the mothers also insisted upon the fact that they have not received, at no point, a satisfactory explanation to be certain that the child’s diet meets in full all his nutritional needs. However, Taveras et al [3] found that communication problems between mothers and health care workers are far too often at the root cause of inadequate mother-baby assessment focused on the fact that breastfeeding was the best way to keep babies healthy. Whereas 91% of the obstetricians certify that they take time to discuss the matter of breastfeeding in depth to support the best possible solutions for mothers and children alike, only 16% of the mothers reported that the matter was clearly discussed during medical visits.

Evidence-based recommendations demonstrate that efficient protection, promotion, and encouragement of breastfeeding need serious procedures, from legal and policy directives to changes in behavior, women’s work and improvement of the working conditions, and health and services to support women and their families to breastfeed in an optimal way. Without engagement and contribution by governments, donors, and civil society, the promotion, defense, and support for breastfeeding will be deficient and we will register unavoidable losses that future generations will rightly call us to account for [26].

It seems that a link exists between the non-compliance to the recommendations and the low socioeconomic and intellectual level. Mothers from low-income households with low education levels tend to diversify earlier. On the other hand, it is reassuring to notice that the counseling given by health workers provides good guidance and precious resources as important part of the introduction of appropriate complementary feeding for 45% of the interviewed. Skinner et al [27] found that the doctor’s recommendations represent a significant factor in the age of introduction of the first solid foods. Spiegelbatt et al [28] noticed that mothers who are well informed on dietary diversification have tendency towards complying with established recommendations in comparison to the misinformed mothers. Nevertheless, almost all the women interviewed expressed deep regret and frustration over the lack of information provided by doctors and nurses, at clinics and primary health-care centers, about breastfeeding and complementary nutrition of children.

Experience from historical data available on dietary diversification teaches us that health professionals need to be pragmatic and humble, and always ensure that their recom-

mendations are acceptable to parents, depending on their history, their culture and their socioeconomic background, family eating habits, the siblings, the traditional practices of previous generations, and also contemporary fashion [14].

Conclusion

Recent experience has shown that education and support for mothers significantly extend the number of months that mothers breastfeed, and are especially helpful in promoting exclusive breastfeeding. Counseling is an enabling process with a strong educational component built within it. There are numerous relevant arguments to invest in the actions undertaken to fill the gaps of knowledge identified by the Moroccan mothers on the complementary feeding of children, as long as their practices remain widely discordant with international standards and recommendations. This requires strategies to promote breast-feeding, and also different activation campaigns and educational nutritional programs for food diversification. On the other hand, emergency expansion of training and capacity development for health professionals ought to be stressed with the aim of adopting measures to enhance the nutritional status of all infants and children through education and improvement of healthy feeding practices on the household and community levels.

Acknowledgments

The authors would like to thank their patients and their parents for taking part in this study.

Disclosures

There were no conflicts of financial, professional or personal interest.

Author Contributions

Habibi Mouna and Barkate Amina conceived and designed the study. Habibi Mouna collected the data. Serhier Zineb performed statistical analysis and interpretation of data. Aguenau Hassan, Radouani Mohammed Amine, Doukkali Loubna, Abkari Abdelhak, Mrabet Mustapha critically draft and reviewed the manuscript. All authors also claim to have read and approved the final manuscript.

References

1. Turck D, Dupont C, Vidailhet M, Bocquet A, Briend A, Chouraqui JP, Darmaun D, et al. [Complementary feeding: Evolving concepts and recommendations]. *Arch Pediatr*. 2015;22(5):457-460.
2. Le Heuzey MF, Turberg-Romain C, Lelievre B. [Comparison of feeding behaviors in mothers of infants and

- young children from 0 to 36 months old]. *Arch Pediatr*. 2007;14(11):1379-1388.
3. OMS. Strategie mondiale pour l'alimentation du nourrisson et du jeune enfant. 2003. http://www.who.int/nut/documents/gs_infant_feeding_text_fre.pdf.
 4. Weinstein-Loison Scarlett. La sante commence par les intestins. ed. Le souffle d'or, 2008. ISBN 10:2840583429
 5. Schwartz C, Chabanet C, Boggio V, Lange C, Issanchou S, Nicklaus S. [To which tastes are infants exposed during the first year of life?]. *Arch Pediatr*. 2010;17(7):1026-1034.
 6. Grosdidier R, Lassié E. A table !!!. Passeport-Nutrition pour petits et grands de la grossesse a l'adolescence. Ed Delville sante. Paris. 2011. ISBN: 978-2-85922-234-5.
 7. MdS/DP et OMS. Politique de Sante de l'enfant au Maroc - Analyse de situation. Ministere de la Sante/Direction de la Population et Organisation Mondiale de la Sante, Bureau regional de la Mediterranee Orientale. 2005.
 8. MdS. Enquete Nationale a Indicateurs Multiples et Sante des Jeunes ENIMSJ 2006 -2007. Ministere de la Sante, Service des Etudes et de l'Information Sanitaire - SEIS, Direction de la Planification et des Ressources Financieres- DPRF Rabat. 2008 a.
 9. HAUT COMMISSARIAT AU PLAN. Comptes marocains nationaux 2007-2012. <http://www.hcp.ma/downloads/> (Base 2007).
 10. Guides alimentaires du PNNS: La sante vient en mangeant et en bougeant. Livret d'accompagnement du guide nutrition des enfants et ados pour tous les parents, destines aux professionnels de sante, theme nutrition. 2004. <http://www.gouv.sante.fr>.
 11. Deschamps JP, et al. Comportement, motivations et connaissances de la mere vis a vis de l'alimentation du nourrisson. *Rev Pédiatrie*. 1977;12:203-212.
 12. Fantino M. pour le SFAE. Etude TNS-SOFRES-Consommation, analyse des donnees nutritionnelles. 2005.
 13. Gojard S. L'alimentation dans la prime enfance. Diffusion et reception des normes de puériculture. *Rev Fr Sociol*. 2000;41:475-512.
 14. Turck D. [History of complementary feeding]. *Arch Pediatr*. 2010;17(Suppl 5):S191-194.
 15. Dupont C, Chouraqui JP, Bocquet A, Bresson JL, Frelut ML, Ghisolfi J, Girardet JP, et al. [Feeding during the first months of life and prevention of allergy: a response from the authors]. *Arch Pediatr*. 2009;16(8):1191-1193.
 16. Chouraqui JP, Dupont C, Bocquet A, Bresson JL, Briend A, Darmaun D, Frelut ML, et al. [Feeding during the first months of life and prevention of allergy]. *Arch Pediatr*. 2008;15(4):431-442.
 17. Greer FR, Sicherer SH, Burks AW. Effects of early nutritional interventions on the development of atopic disease in infants and children: the role of maternal dietary restriction, breastfeeding, timing of introduction of complementary foods, and hydrolyzed formulas. *Pediatrics*. 2008;121(1):183-191.
 18. Agostoni C, Decsi T, Fewtrell M, Goulet O, Kolacek S, Koletzko B, Michaelsen KF, et al. Complementary feeding: a commentary by the ESPGHAN Committee on Nutrition. *J Pediatr Gastroenterol Nutr*. 2008;46(1):99-110.
 19. Dutau G, Lavaud F. Existe-t-il reellement une fenetre d'opportunité pour la diversification alimentaire? L'exemple de la maladie caliaque a la lumiere de publications recentes. *Revue Francaise d'Allergologie*. 2015;1(55):1-4.
 20. Rigal N. [Food diversification and taste building]. *Arch Pediatr*. 2010;17(Suppl 5):S208-212.
 21. Societe Suisse de Nutrition. Mere et enfant - L'alimentation durant la grossesse, l'allaitement et la premiere annee de vie. Berne. 2011.
 22. Rossant-Lumbrosso J, et al. Bien nourrir bebe de 0 a 3 ans. Ed Odile Jacob. 2007.
 23. Gonzales C. Mon enfant ne mange pas. La Ligue Leche (LLL) Madrid. 2010.
 24. Girardet JP, Tounian P. La diversification alimentaire du nourrisson: quelques erreurs a eviter. *Realites Pédiatriques*. 2000;47:19-22.
 25. Schilling FC. Connaissances des meres sur l'alimentation et la sante des enfants de la naissance a 3 ans. These de doctorat en medecine faculte de medecine Nancy 1, 1989.
 26. Rollins NC, Bhandari N, Hajeebhoy N, Horton S, Lutter CK, Martines JC, Piwoz EG, et al. Why invest, and what it will take to improve breastfeeding practices? *Lancet*. 2016;387(10017):491-504.
 27. Skinner JD, Carruth BR, Wendy B, Ziegler PJ. Children's food preferences: a longitudinal analysis. *J Am Diet Assoc*. 2002;102(11):1638-1647.
 28. Spigelblatt L, Laine-Ammara G, Arsenault L, Zvagulis I, Pless IB. [Influence of follow-up education of mothers about too early introduction of solid food to infants]. *Pediatric*. 1991;46(5):475-479.