

Knowledge and Training Needs on Child Nutrition of Health Workers in the Autonomous Community of Cantabria, Spain

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Abstract

Introduction: Child nutrition Pediatric counseling is an important aspect of pediatric care and health professionals are often responsible for doing so. However, there are few studies on the level of knowledge of these professionals and what their training needs are to keep them up to date.

Objective: To provide information on child feeding knowledge and the training needs of pediatricians, pediatric nurses and pharmacists.

Methods: Postal, survey, anonymous, using a self-administered questionnaire of 104 items, with four domains: breastfeeding, artificial breastfeeding, complementary feeding and obesity prevention. The questionnaire was distributed to all pharmacists, pediatricians and collegiate pediatric nurses practicing in Cantabria (Spain). Differences between professions were earned through the Kruskal-Wallis test.

Results: The overall participation rate was 73.6% (495/672); 73.6% (368/500) among pharmacists; 68.0% (83/122) among paediatricians and 88.0% (44/50) among nurses. The median percentage of correct responses was 80.4% (IQR 26.2) and the lowest scores were relative to complementary feeding: 66.0% (IQR 27.2). Pediatric pediatricians and nurses scored higher than pharmacists on breastfeeding and complementary feeding ($p < .05$). Most respondents (98.0%) they had advised on child nutrition during the previous month; 93.0% believed they needed more nutrition training and 81.0% preferred to take online courses.

Conclusions: Professionals show a good knowledge about child nutrition, but there are disparities between the different professions. More continuous training is needed, with special emphasis on complementary feeding.

Keywords: Pediatrics; Nutrition; Feeding Behavior; Food; Continuing Education; Knowledge

Introduction

Proper infant feeding promotes the achievement of adequate. Population development, also intervening in the prevention of nutrition-related diseases that may occur during childhood, adolescence and adulthood [1-3]. In addition, it also helps to learn stable nutritional habits because exposure during childhood to very sweet or very salty flavors contributes to the stable can of food preferences [4].

During the first six months of life, nutritional needs are adequately covered by breastfeeding, but from that moment on it is necessary to progressively introduce new foods into the diet [5,6]. As nutritional requirements during childhood present much greater variability than in later phases of life, families frequently turn to health professionals for advice or clarification about their children's nutrition. These professional recommendations influence the decisions that parents ultimately make [7-9] since, for example, the instructions of health professionals have contributed significantly to promoting breastfeeding [10] and raising awareness among mothers about breastfeeding importance of its duration [11].

In order to adequately advise families, it is imperative that health professionals keep their knowledge of child nutrition up-to-date, but few studies exist in our country on what is the real level of this knowledge or what are the best ways to do so. Keep them up to date. It is true that there are ongoing training programs [12-14], but before planning training strategies it is convenient to determine what existing knowledge is in order to establish which people should receive training and on what specific topics it should focus on. This way of proceeding contributes to improving the participation and implication of professionals in teaching programs, increasing their levels of satisfaction with them and facilitating that the training received has a real impact on daily clinical practice [15-18].

Objective of the Study

The main objective of this study has been to assess knowledge and evaluate the training needs on infant feeding among health professionals in Pediatrics, Nursing and Pharmacy in the Autonomous Community of Cantabria (Spain) and, with this information, to establish recommendations on the design of future teaching programs on child nutrition.

Material and Methods

It is a cross-cutting descriptive study carried out among health professionals whose activity is related to child nutrition and residents of the Autonomous Community of Cantabria. Pediatricians, pediatric nurses and pharmacists were considered a healthcare professional. To this end, the Official College of Physicians, the Official College of Nursing and the Official College of Pharmacists of Cantabria were attended. From their records, they identified 672 collegiate professionals who were broken down as well: 500 pharmacists, 122 pediatricians (Primary Care, Specialized and MIR) and 50 Pediatric Nursing professionals.

For data collection, a self-administered questionnaire designed by a panel of 45 experts was used. Among them were members of the Ordesa Chair of Child Nutrition, belonging to the University of Cantabria and the University of Zaragoza, as well as representatives of scientific societies and professional colleges previously mentioned in Cantabria. The instrument developed by this panel of experts included items based on the updated review of the scientific literature and on the experience of the members of the expert group. With the first version of the questionnaire, a pilot test was carried out to check the apparent validity (face validity) and acceptability of the items. In its final version, the questionnaire included 104 items, which were answered as correct or incorrect, divided into four thematic blocks: a) breastfeeding - 25 items, b) artificial feeding - 25 items, c) complementary feeding - 29 items and d) role of nutrition in the prevention and development of obesity - 25 items. In addition, each participant was asked how many times they had made nutritional recommendations in the last month, if they felt they should improve their knowledge of child nutrition and, if so, what would be the training modality they would prefer.

All the professionals previously identified, together with the questionnaire and an envelope stamped at destination, were sent a letter from the respective professional associations requesting their collaboration, explaining the purpose of the study and guaranteeing the confidentiality of their responses. It was specified that the information collected would only aim to improve the educational offer on child nutrition and the responses would be analyzed globally. The estimated time to complete the questionnaire was about 45 minutes and no incentive was offered to improve the response rate. The period of distribution and receipt of the questionnaires was 3 months, from July 1 to September 30, 2014. When there were four weeks left to reach the deadline to return the completed ques-

tionnaires, the participants who had not answered all- Via received a second letter, as a reminder.

The results of the study have been analyzed by calculating the percentage of participants who correctly responded to each item, as well as the median and interquartile range (IQR) of the percentage of correct responses of all the items in the questionnaire and each area of knowledge. Differences in results between groups have been assessed with the Kruskal-Wallis non-parametric or Chi squared test, with the result significantly considering the result for a value of $p < 0.05$. SPSS 22 statistical software for Windows (IBM Corp) has been used. Released 2013. IBM SPSS Statistics for Windows, Version 22.0. Armonk, NY: IBM Corp).

Results

Of the 672 people requested to participate in the study, 495 respondents, so the total participation rate stands at 73.6%.6%. By groups of professionals the participation rate was 73.6% for pharmacists (368/500),68.0% for pediatricians (83/122) and 88.0% for nursing (44/50), 2 (2) x 7.29 p x 0.026.

Table 1-4 detail the items that made up each thematic area, the answer considered correct and the percentage of successful answers for each of them. The median para percentage of the total percentage of successful responses was 80.4%% (IQR 26.2), for breastfeeding it was 80.5% (IQR 28.2), for artificial breastfeeding 84.9% (IQR 25.4), for complementary feeding 66.0% (IQR 27.2) and finally, nutrition and obesity 79.7%% (IQR 21.0) (Figure 1).

Question	Correct answer	% hits
1. Breastfeeding is the best quality food for the newborn when the mother is not malnourished	V	99
2. During the second year of life, breast milk is of good quality	V	60
3. If the mother takes amoxicillin we should temporarily suspend the LM	F	73
4. If the mother is receiving chemotherapy or radiation therapy treatments she can continue with THEL	F	93
5. LM is recommended as the only food up to 6 months	V	81
6. LM is recommended as the only food up to 3 months	V	86
7. A normal newborn should receive nothing but LM	V	91
8. Water must be offered in addition to the LM from the month	F	80
9. Colostrum is nutritionally despicable	F	95
10. The composition of ripe milk is similar to colostrum in terms of the total amount of protein	F	92
11. The amount of lactose in transitional milk is somewhat lower than that of mature milk	F	22
12. The composition of mature milk in protein content is 40% casein and 60% lactic whey	F	42
13. It is excessive to breastfeed more than 8 times a day	F	65
14. Proper breastfeeding position generally prevents cracks	V	90
15. MRL should be discontinued if mastitis appears	F	73
16. MRL should be discontinued when the baby has diarrhea	F	87
17. LM recommended in twins	V	89
18. LM should be discontinued if the mother becomes pregnant again	F	87
19. Breast milk can be stored 48 hours between 0 and 4°C	V	74
20. If it is to be kept for longer, should it be frozen at -20°C?	V	72
21. Once thawed you can keep a few more hours in the refrigerator	V	90
22. The total correct calorie needs are 110 Kcal/kg/day at 2 months	V	53
23. The total correct calorie needs are 104 Kcal/kg/day at 8 months	V	42
24. The total correct calorie needs are 87-89 Kcal/kg/day at age 4	V	16
25. The total correct calorie needs are 47 Kcal/kg/day in adult	F	92

Table 1: Breastfeeding (LM).

Question	Correct answer	% hits
1. All milk formulas are the same, similar and there are no differential characteristics between them	F	96
2. There is no need to influence how bottles should be prepared because mothers have sufficient knowledge	F	98
3. Start formulas are recommended between 0 to 4-6 months	V	93
4. Continuation formulas are recommended from 4-6 months to one year	V	82
5. Growth formulas are recommended for 1 to 3 years	V	97
6. The protein source of the starting formulas are purified from cow's milk, whey and casein	V	94
7. Growth formulas are fortified with iron, vitamins and minerals and may contain corn syrup, lactose and sucrose	V	89
8. The powdered starter formulas are designed to be constituted in 13% water (1 shallow scoop of 4.5 g per 30 ml of boiled water)	V	83
9. As a rule, 25-30 ml of formula per kilo of weight will be offered and taken	V	87
10. Milk can be reconstituted with tap or mineral water interchangeably	V	26
11. In the case of using mineral waters, the first choice would be those of strong mineralization	F	93
12. Milk already reconstituted for 24 hours can be stored in a thermos	F	63
13. Microwave is an excellent system for bottle sterilization	F	76
14. If infant milk is enriched with vitamin D, the oral supplement is not necessary	F	85
15. With special formulas: before any child who regurgitates, an anti-reflux formula should be recommended	F	54
16. Lactose-free formulas should always be used after a process of water gastroenteritis	F	34
17. Soy formulas must be supplemented with methionine, L-carnitine, iron and zinc	V	84
18. Hydrolyzed formulas: it is considered a formula with extensive protein hydrolysing when its peptides have a molecular weight of less than 5000 daltons	V	20
19. Special formulas are synthetic diets and can be used in cases of infant colic	V	85
20. It is a mistake to indicate an anticholic formula for a baby's crying without knowing what its real cause is	V	95
21. The inadequate weight gain of more than one month in less than 2 years and a nutritional support indicator	V	92
22. Weight loss or stagnation for more than three months in children older than 2 years is an indicator of nutritional support	V	70
23. The loss of two weight percentile ranges for age is a nutritional support indicator	V	91
24. Triceps crease repeatedly lower than P3 for age is an indicator of nutritional support	V	92
25. A decrease in growth rate of more than 2 cm per year is an indicator of nutritional support	V	65

Table 2: Artificial lactation (LA).

Question	Correct answer	% hits
1. Recommendations on AC vary by cultures and countries	V	95
2. It is a mistake not to introduce the AC before 6 months	F	89
3. Generally, from 4 months on-screen the LM does not meet the nutritional requirements of infants and supplements should be administered	F	65
4. From 8 months as a rule, they can already start chewing	V	66
5. If solid and lumpy food is not introduced before 10 months, the risk of subsequent non-acceptance increases	V	57
6. There is a scientific basis for the order of introduction of AC	V	57

7. The introduction of legumes before the year of age is prohibited	V	41
8. Most scientific societies do not recommend the introduction of cow's milk before 12 months	V	94
9. When the child starts with cow's milk, it is recommended that it be semi-skimmed	F	62
		51
10. Gluten is currently recommended no or before 4 months	V	66
11. Gluten is currently recommended no or later than 7 months	V	92
12. Gluten is currently recommended later than 8 months	F	76
13. The introduction of gluten while breastfeeding has no benefits	F	90
14. The gradual introduction of gluten has no advantages	F	93
15. If there are any celiac children in the family, the brother should be delayed from introducing	F	71
16. If the baby does not take the fruits properly, it can be sweetened with natural honey n	F	81
17. From 6 months on, preparations containing cocoa can be introduced	F	89
18. No more than 2 grams of salt should be given to purees	V	66
19. Sporadic or continued use of commercial feeding jars is safe	V	87
20. Vegetable purees lose food properties if frozen	F	62
21. The introduction of complementary feeding before 4 months is not associated with the risk of obesity in adulthood	F	75
22. During the first year of life, the use of green leafy vegetables should not be greater than 40% of the total content of puree	V	63
23. 8-grain porridge is better than 4 cereal porridge	F	88
24. We can vary the composition of the fruits in the porridge according to the consistency of the faeces	V	90
25. Commercial juices can be enjoyed without restriction	F	35
26. Daily calcium recommendations are 600 mgr/day	F	43
27. Energy needs in the second year of life are greater than the first	V	61
28. The first year of life a child should drink at least 100 ml of water/day	F	66
29. A child cannot be 9 hours without eating because of risk of hypoglycemia	F	95

Table 3: Complementary feeding (AC).

Question	Response	% Success
1. Diagnosis of obesity-overweight should be made below age 3	V	80
2. BMI should be routinely calculated	V	76
3. The measurement of abdominal circumference in relation to size in childhood is useful	V	73
4. An infant with excessive weight does not pose a health risk in adulthood	F	80
5. Eating habits must be acquired from the earliest years of a child's life	V	98
6. Breakfast should provide all the necessary nutrients for proper performance with all immediate principles	V	97
7. If the child did not have breakfast, the diet could be supplemented in a balanced way in the rest of the shots	F	69
8. You can do without the mid-morning intake during this childhood stage	F	80
9. Refreshing drinks can be offered daily without restriction	F	92
10. Making meals as a family and preventing the child from eating only with television and other consoles or mobiles does not influence the development of obesity	F	78

11. Fast food should be eaten sporadically and should not be incorporated into a child’s dietary habits	V	96
12. We should eat four pieces of vegetables, plus fruit a day	F	8
13. Light foods should be recommended to children from the year of life	F	96
14. Physical exercise is critical in the prevention of cardiovascular health since childhood. It should be practiced 2 times/week	F	95
15. Healthy eating campaigns from school are not considered necessary	F	95
16. Probiotics are living microorganisms that when ingested short for the duration of infectious diarrhea	F	41
17. Probiotic intake contributes to the preinvention of antibiotic-associated diarrhea	V	70
18. The intake of probiotics is an adjunct in the eradication treatment of <i>Helico-bacter pylori</i>	F	78
19. Probiotic intake is adjuvant in the eradication treatment of <i>Clostridium difficile</i>	F	76
20. Probiotic intake contributes to the revenir of lactose intolerance secondary to gastroenteritis	F	72
21. Probiotic intake contributes to food allergy reinvention and treatment	F	89
22. Probiotic intake is very beneficial in cystic fibrosis	F	90
23. Probiotic intake is very beneficial in inflammatory intestinal disease	F	70
24. Prebiotics are non-living substances that once ingested promote the formation of natural intestinal bacteria in the colon	V	91
25. There are preparations on the market that combine probiotics and prebiotics (synbiotics))	V	92

Table 4: Role of nutrition in the prevention and development of obesity.

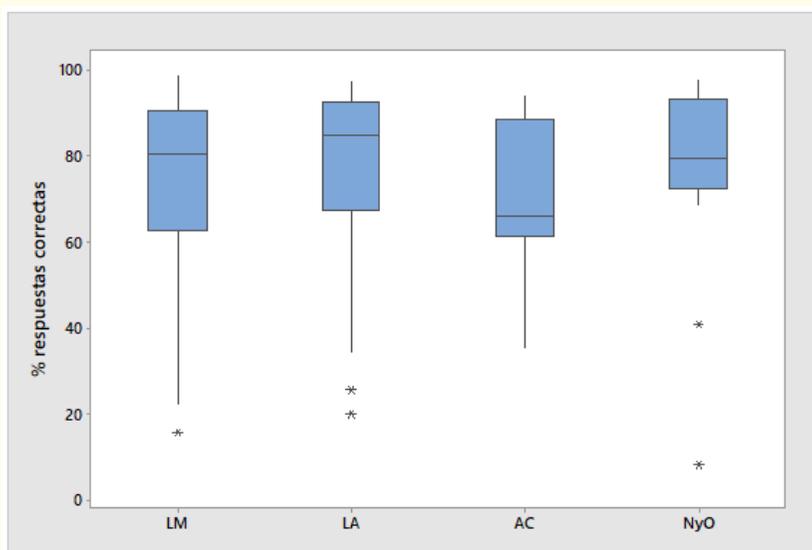


Figure 1: Percentage of successful answers in each thematic area.

LM: Breastfeeding; LA: Artificial Breastfeeding; AC: Complementary Feeding; NyO: Role of Nutrition in the Prevention of Obesity.

There were only significant differences in the right answers depending on the type of professional answering in two thematic areas. With regard to knowledge of breastfeeding, it became clear that there was a significant difference in the median of successful

responses ($H(2) \times 11.15, p < 0.05$). The biggest difference was between pharmacists (74.3% IQR 34.5) versus paediatricians (97.7% IQR 10.7) and nursing (93.0% IQR 10.4). Something similar happened with complementary feeding ($H(2) \times 6.96, p < 0.05$). Also

in this case the biggest difference existed between pharmacists (63.9% IQR 34.5) versus pediatricians (91.0% IQR 43.0) and nursing (88.6% IQR 19.3).

98% of participants said they had made recommendations on child nutrition over the past month and 26% said they had done so on more than 10 occasions. About 93% felt it necessary to increase their training on this subject and, if participating in some training program, 81% preferred to do so through "online" courses.

Discussion and Conclusion

This study on training needs in child nutrition has allowed us to find that there is a very high interest in updating knowledge and continued training in infant feeding, as more than ninety percent of the participants have stated. We also assumed that professionals were involved in the decision-making of families on child nutrition and, in our study, virtually all of them (98%) they noted that they had made recommendations on this issue during the previous month.

The knowledge assessment instrument has been well accepted by the different types of professionals since the participation rate in the study has been approximately 73%. On average, participation rates in survey-type studies among physicians are usually 54 - 58% [19,20] and in our case, participation has been higher in all professional groups. Particularly noteworthy is the high participation of the nursing community (88.0%) with a statistically significant difference with respect to the other groups, which may show their interest in child nutrition.

Globally, we can consider that there is a good level of knowledge and involvement among health professionals since, globally, the median of correct answers is above the value of the third quartile. However, when considering each of the subject areas separately, the lowest figures of correct answers are found in the sections on complementary feeding and the relationship between nutrition and obesity.

In complementary feeding the lowest scores focus on gluten introduction guidelines in the diet, the safety of food jars and indications of prebiotics and probiotics [21-26]. These results may relate to the fact that there is currently no clear scientific consensus on recommendations for the more or less early inclusion of these foods and there are even criteria that have been modified over time, including on-demand or tolerance feeding. This variability

in the guidelines can influence professionals to be less accurate in their responses. Even the fact that pharmacy professionals show a lower level of knowledge than pediatricians and nurses may be related to this topic being further removed from their daily field of activity.

In the case of the relationship between nutrition and obesity, the need for an early diagnosis of overweight and obesity stands out, as well as that professionals should actively and specifically recommend the practice of physical exercise [27,28]. It should be noted that there has been a classic concept of health among the general population that considered overweight children and even obesity healthy. In addition, because starting at age 2 decreases the number of annual reviews, parents do not usually go to the pediatrician when their children show a significant weight increase without another associated symptomatology. For both reasons, health professionals should help raise public awareness of the need to avoid and control excessive weight gain during childhood to prevent it from evolving into metabolic syndrome during adolescence and/or early adulthood. To do this, they need to routinely explore appropriate parameters during consultations to diagnose overweight and obesity. In addition, they should report on the most appropriate type of diet and healthy lifestyle habits, as there is no routine of prescription exercise by professionals.

Also noteworthy are the aspects about which there is a higher level of knowledge, especially all those that concern breastfeeding. There is a high degree of information about artificial breastfeeding since a large part of the daily clinical activity that concerns infant nutrition is related to this topic. When breastfeeding is not possible, it is necessary to recommend to the mother the type of artificial milk that best mimics the characteristics of breastfeeding and how to use it for as long as necessary. In the case of breastfeeding, the results obtained may have been influenced by the intense breastfeeding promotion campaigns that have been carried out, explaining its advantages, together with a large training offer on this subject for professionals in the pediatric field. The fact that the group of pharmacists shows a lower level of knowledge in this field may be justified because they have a less professional relationship with this specific topic.

However, even in these well-known areas, there are also areas where continuing education is necessary. For example, in artificial lactation the level of knowledge is lower regarding the indications of special formulas, the criteria for nutritional supplements and the

preparation and storage of formulas. It is plausible to think that this finding is related to the large number of artificial milk on the market, with small modifications in their formulation and aimed at improving the symptoms triggered by infant colic, functional constipation, regurgitations, etc. Breastfeeding, despite being a well-known area, also has less well-known aspects, such as variations in the composition of breast milk over time and the measures required for its conservation. Breast milk evolves like living beings, it changes throughout the breast, the day and the months, adapting in each circumstance to the needs of infants. Its conservation becomes an important issue and it is important to know which containers are the most suitable for its conservation and for how long it can be kept in good condition depending on the method used.

Nine out of ten people who have participated in the study have shown interest in conducting training programs on child nutrition and eight out of ten will prefer to do so through online training. This data is important when designing new training programs it seems that professionals appreciate the time and spatial flexibility, the concreteness and the ability to avoid the problems of other more traditional methods such as rigid schedule, the size of the group receiving training or the physical location of the classroom. However, we should also not forget that there are aspects where traditional training remains relevant, so rather we would have to see the two types of training as complementary, albeit with a special relevance of online training in the case of child nutrition.. We can also consider that the existence of significant differences between groups of professionals with regard to breastfeeding and complementary feeding highlights that the contents of the training programmes may be different for each group, to adapt to the specific needs they have for the development of their work.

Among the strengths of this study, it should be noted that all health professionals with involvement in child nutrition in Cantabria were accessed and that 73% decided to respond. As limitations we must point out that there may be a certain bias in the selection of participants. Possibly those who are more interested in everything related to child nutrition may have been more inclined to complete the questionnaire. Consequently, these people with higher interest are likely to also have more knowledge about this topic than those who chose not to participate. Despite this, aspects have been identified in which it may be necessary to improve the existing level of knowledge even among the professionals most aware of everything related to child nutrition.

In conclusion, we consider that health professionals have an interest in child nutrition and the vast majority of them routinely make recommendations on this issue to families. In general, the level of knowledge they have shown is high, with slight differences between the professional collective days that may be based on their specific professional activity and that justifies the need to propose training programs with differentiated content. We also have an evaluation tool, which with regular reviews based on the evolution of the “state of the art” at that time of knowledge on child nutrition can contribute to the design of better teaching programs, by identifying specific areas in which it is necessary to influence during continuous training.

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