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PAGES: 357-364

ORIGINAL PDF URL: <https://dergipark.org.tr/tr/download/article-file/593327>

The Importance of Consumption of Fish Meat in Early Childhood Period in Terms of Healthy Development

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Geliş : 13.03.2018

Kabul : 22.05.2018

Review / Derleme

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E.Dergi ISSN: 1308 -7517

DOI: [10.22392/egirdir.405244](https://doi.org/10.22392/egirdir.405244)

Abstract

Early childhood period (0-8 years) is the fastest period of human development and is the most demanding period. This period covers the whole of the physical, mental and social developments. There are three main factors that influence these development types. They are nutrition, environment and education. The importance of nutrition in child development starts in the womb, and it also continues after the birth. During the period of pregnancy, every nutrient that has a place on the mother's own diet also has an indirect effect on the baby. This situation also continues during the postpartum breastfeeding period. Protein-based foods should always be found in the children's nutrition programs during the period of supplementary food and afterwards. The fish is a highly nutritional food source and is also an excellent source of nutrition for the babies. It's a food that is extremely rich in omega-3. Omega-3 fatty acids in the fish are considerably beneficial for babies' brain development. The fish is also rich in iron, calcium, zinc and magnesium. These minerals are also very advantageous in the development of the baby. The fish is a protein source with high nutritional value because of its vitamin, mineral and fat contents, in addition to being easily accessible in our country, whose three sides are surrounded by the sea, and whose water resources are fairly rich. Our country's waters are also rich in fish species and the fish prices are suitable for every budget size. In this study, the importance of consuming fish meat during the early childhood period, where the basis of a healthy life is constituted, in terms of healthy development has been investigated.

Keywords: Fish meat, early childhood period, development, omega-3

Erken Çocukluk Döneminde Balık Eti Tüketiminin Sağlıklı Gelişim Açısından Önemi

Özet

Erken çocukluk dönemi (0-8 yaş) insan gelişimin en hızlı olduğu ve dikkat gerektiren dönemidir. Bu dönem fiziksel, mental ve sosyal gelişimin tümünü kapsamaktadır. Bu gelişimleri etkileyen üç ana faktör bulunmaktadır. Bunlar beslenme, çevre ve eğitimidir. Beslenmenin çocuk gelişimindeki önemi anne karnında başlamakta olup; doğum sonrasında da devam etmektedir. Hamilelik döneminde annenin kendi diyetinde yer verdiği her besin dolaylı yoldan bebeği de etkilemektedir. Bu durum doğum sonrası emzirme döneminde de devam etmektedir. Ek gıda ve sonrası dönemlerde çocukların beslenme programları içeriğinde protein kaynaklı yiyecekler her zaman bulunmalıdır. Balık besleyici yönü yüksek olan ve bebekler için mükemmel bir besin kaynağıdır. Omega-3 yönünden oldukça zengin bir besindir. Balıklardaki omega-3 yağ asitleri bebeklerin beyin gelişimi için oldukça faydalıdır. Balık ayrıca demir, kalsiyum, çinko ve magnezyum açısından da zengindir. Bu mineraller de bebeğin gelişiminde oldukça faydalıdır. Üç tarafı denizlerde çevrili ve su kaynakları oldukça zengin olan ülkemizde balık; rahatlıkla ulaşılabilmesinin yanı sıra vitamin, mineral ve yağ içerikleri nedeniyle besin değeri oldukça yüksek bir protein kaynağıdır. Ülkemiz suları balık türleri bakımından da zengin olup her bütçeye hitap etmektedir. Bu çalışmada, insan sağlığının temelleri atılan erken çocukluk döneminde balık eti tüketiminin sağlıklı gelişim açısından önemi araştırılmıştır.

Anahtar kelimeler: Balık eti, erken çocukluk dönemi, gelişim, omega-3

INTRODUCTION

Nutrients such as proteins, carbohydrates, fats, vitamins, minerals and water are needed from the daily consumed foods in order to maintain the regular function of the cells, which are the smallest building blocks of the body. Sufficient quantities and regular intake are important for growth, continuity of life, protection of health and are defined by the concept of adequate-balanced nutrition. Growth and development are hindered and health is negatively affected if none of these essential nutrients is taken or insufficiently or excessively taken. Even though this situation is important for all age groups and genders, it is especially more important for individuals in pregnancy, breastfeeding, infancy, childhood, adolescence, and old age, which are known for being risk groups (Karaağaoğlu and Eroğlu Samur, 2015).

Parallel to the rapidly increasing population, the nutritional needs are also increasing. Today, people are trying to make the most of aquatic resources to meet their nutritional needs and to minimize nutritional problems. Aquatic products are easy to digest, are effective in balanced nutrition, and have a high nutritional value. For this reason, meeting some of the high-quality nutritional needs makes them even more important (Şen *et al.*, 2008; Sivri *et al.*, 2011). The most consumed and preferred food groups among them are the fish varieties (Sivri *et al.*, 2011). Despite the fact that their benefits on human health are known, fish consumption in Turkey is still not at the desired level (Aydın and Karadurmuş, 2012; 2013).

The quality of a nutrient depends on the fact that the proteinaceous substances it contains are rapidly soluble in the digestive tract with the influence of enzymes. Fish meat proteins are of great importance for both growing individuals and for those who are in physical and mental activities, due to their features such as quick dissolution and easy digestion. (Balık *et al.*, 2013). The average consumption of seafood is 18 kg/per person in the world and the average of European countries is 23 kg/per person while the average of our country is 6.2 kg/per person (TUIK, 2016). Today, in the majority of developed countries, people prefer healthy foods that are nutritious. Among these nutrients, fish and other aquatic products that are rich in polyunsaturated fatty acids are seen to be the most preferred.

Being able to raise healthy children is possible with balanced and adequate nutrition during early childhood. Adults, who take care of them need to be conscious and careful since they do not yet know their developmental characteristics, abilities, interests and needs in early childhood and they are not able to express their emotions and thoughts. Children, who cannot have a balanced and healthy nutrition in this period, are slow to develop and they carry these negative traces throughout their lives. In this study, the importance of fish meat consumption in terms of healthy development in the early childhood period was evaluated.

Early childhood and nutrition

Early childhood development involves the physical, mental and social development of children in the early stages of life (0-8 years) and includes all attempts at nutrition, health, mental development and social communication of children. It is possible to mention three main components that affect early childhood development: nutrition, environment and education (Özmert, 2005).

Nowadays, while determining the development level of the countries, the nutrition way of the children is a more important parameter than the indicators such as the commercial capacity of that country, the income per capita and the average of lifespan. This is not only the general indicator of child health but also the level of education of that country. Malnutrition, as well as the emergence of different health problems in developed and developing countries, also affects the achievements of the children in education and training (Hatun *et al.*, 2003; Küçükali, 2006).

Breastmilk and supplementary nutrition have always maintained a significant place in human life throughout history. According to the information obtained from the leaves of papyrus written in ancient Egypt in 1550 BC, the recommended period for breastfeeding is up to 3 years. In ancient Greece, it is suggested that only breastfeeding is recommended for the first 6 months (Turck, 2010; Devecioğlu and Gökçay, 2012). Today, according to the results of scientific researches, the healthiest form of nutrition in the first years of life is “breastfeeding alone without any additional food including water for the first six months, and maintaining the breastfeeding until at least two years, starting with appropriate supplementary nutrients in the sixth month”. This proposal is being accepted scientifically by the health ministries of many countries, and particularly by the World Health Organization (Devecioğlu and Gökçay, 2012).

The second important step in the establishment of the nutritional system is the provision of supplemental nutrients (Özmert and Yurdakök, 1995; Tokatlı, 2003). When additional nutrients are given, as well as the child's biological needs and the hygiene of the food, this inter-maternal-infant relationship will affect this period and the future years of the child's life. After six months (6-36 months), babies enter the process of separation and individualisation. This period is also the period when additional nutrients are introduced (Satter, 1990) (Table 1).

Table 1. Recommendations for supplementary nutrition for children 6 to 23 months of age fed with breastmilk (supplementary nutrients) (WHO, 2009; Devecioğlu and Gökçay, 2012).

Age	Additional calorie requirement	Properties of the nourishments	Frequency	Amount to be consumed in a meal
6-8 months	200 kcal day ⁻¹	Intense puree or crushed	2-3 day 1-2 times as snacks	2-3 dessert spoon - 250 ml, half of the bowl
9-11 months	300 kcal day ⁻¹	Thinly cut or crushed, as the baby can take with his hand	3-4 meals 1-2 times as snacks	250 ml, half of the bowl
12-23 months	550 kcal day ⁻¹	Family kitchen, shredded or crushed if necessary	3-4 meals 1-2 times as snacks	250 ml, ¾ half of the bowl

The initiation of supplementary nutrients at the sixth months, as well as the breastfeeding of the child until the age of two, contribute to both physical and mental health positively (Butte, 2001; Davis, 2001; Reynolds, 2001). Additional nutrients are fruit juices and purees, vegetable purees, soups, pudding, yoghurt, eggs, meat, edible offal and legumes. In the seventh month, the child may be fed with food prepared using nourishments of different nutrient groups at certain meals (Anonymous, 2013).

A good supplement should be clean and safe (pathogen, harmful chemical, toxin-free), not too hot, spicy and salt free, rich in energy, containing protein and micronutrients (especially Fe, Zn, Ca, Vit C, Vit A), easy to prepare, easy to consume, and most importantly, the child must like this nutrient. Red meat, chicken, fish or eggs should be kept in the everyday diet or as often as possible. The World Health Organization also states that a diet containing only animal-derived nutrients can provide enough calcium, iron and zinc (Bülbül, 2004).

Parents can set limits both on nutrition time and content, once the child has reached the age of one. Child's one-week balanced consumption and normal growth of the child should be considered as important parameters to decide the nutrition time and content since the children's food consumption may vary from day to day. Problems with nutrition and growth in children are mainly due to three reasons: medical or physical causes, inappropriate nutrient selection, and inadequate nutritional dynamics. For this, it would be appropriate for the children to be assessed for all these three reasons. During this period (from one year to four), the child will show significant progress in all areas of development. Children also need to have a healthy and regular diet during early childhood (Özmert, 2005).

Nutritional content of fish meat

Fish are generally classified as fat-free when they have less than 2% fat, and fatty when they have more than 5% fat, based on their fat content. Most of the fat in the fish meat is found as triglycerides. These compounds are esters made with glycerol of 3 molecular fatty acids. Fatty acids are triglycerides composed of carbon chains of different lengths showing the degree of fat saturation (Pigott and Tucker, 1990). In nature, unsaturated fatty acids are omega-9, omega-6 and omega-3, and they are called oleic, linoleic and linolenic. Eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA), which are the two important fatty acids found in all kinds of seafood and not found in other food species, are linolenic series omega-3 fatty acids. It is indicated that these two fatty acids cause significant biochemical and physiological changes in the body (Gordon and Ratliff, 1992). Fish oils are more valuable in terms of nutrition than those obtained from terrestrial animals. Fish oil contains 20% saturated fatty acids, with unsaturated fatty acids at 80%. Most of these unsaturated fatty acids also form polyunsaturated fatty acids. Fish oil is the sole source of EPA and DHA acids, which are n-3 group fatty acids (Varlık *et al.*, 2004; Mol, 2008).

The protein level in fish varies between 15-20% (Gülyavuz and Ünlüsayın, 1999). Fish proteins contain all the amino acids necessary for the protection and development of body tissues. These essential amino acids are also found in plant proteins, but there are low amounts of lysine and methionine in plants. Although it is a false belief, it is generally believed that meat is a better source of protein than fish (Love, 1982). When aquatic products are compared to other ground animals as a protein source, for example, the trout has a protein content of 19%, and there's a 16% protein content in sheep meat. Since the essential fatty acid content of aquatic products is rich, they can be shown among high nutrients such as milk and eggs (Karabulut and Yandı, 2006). In addition, the importance of the fish, which is a dietetic and low energy nutrient, and which contain vitamins (niacin, folic acid, A, D, E and K) and minerals (iodine, fluorine, phosphorus and selenium, vanadium, sulphur), has been increasing (Tatar, 1995; Erdem and Çelik, 2003).

The importance of fish consumption in early childhood

Hyperactivity is defined as a lack of attention. The main characteristic of hyperactivity impairment is the shortened duration of attention, which is permanent and continuous and is expressed as aggravation and discomfort in behaviours due to the lack of supervision for prevention (Öncü and Şenol, 2002). In hyperactive children, n-3 and n-6 were observed to be quite low, and aggression was shown to be inhibited in young people who added DHA to their diets (Arnold, 2001).

It is reported that when treating the asthma patients, especially asthma observed in childhood, DHA and EPA are added to the diet of these people, and disease symptoms are not observed anymore (Hodge *et al.*, 1998; Nagakura *et al.*, 2000). In a study in which children were observed for 5 years from one year of age, the omega - 3 fatty acids added to children's diets were found to be highly effective in the prevention of allergic asthma caused by the mite (Mihreshahi *et al.*, 2001). In another study, the effects of omega-3 fatty acids in the treatment of house dust and mite-induced allergic asthma in childhood were followed for 3 years. The results of the study have shown that omega-3 fatty acids are highly effective in treating such disorders (Peat *et al.*, 2004). It is stated that these fatty acids show positive results in the treatment of problems such as childhood behavioural disorders and learning difficulties. However, more extensive research is needed (Richardson, 2004). In another study, it was concluded that children fed with food species containing DHA are better than children who are fed with DHA-free foods, in terms of brain and also mental development. At the same time, consumption of DHA-containing foods is recommended for infants who cannot receive breast milk for various reasons (Agostoni *et al.*, 1995).

Studies have shown that the antithrombotic effect of omega-3 fatty acids prevents coronary thrombosis risk (blood clotting in the coronary arteries) by modifying thrombosis activity and reducing the clustering of these disc-shaped blood factors that cause the blood clotting (Köksal, 2003). As A, K, D and B vitamins are necessary for growth and development, it is important to have fish in the diet of children (Köksal and Özel Gökmen, 2008).

Since the main source of nutrition is ground animal products, the milk of mothers who consume them at a low level and the babies eating less meat are at risk of vitamin B12 deficiency. It is estimated that three out of two school-age children may be deficient (Siekman *et al.*, 2003). There are a number of studies conducted to identify the importance of omega-3 fatty acids in the development of the foetus and the new-born infant. In particular, omega-3 fatty acids needed during the last three months of pregnancy and during infancy are very important for brain, eye and nervous system development (Agostoni *et al.*, 1995; Mahaffey, 2004; Ricardo and Dangour, 2006). It is also noted that consuming omega-3 fatty acids during pregnancy, reducing the risk of premature birth (Olsen and Secher, 2002).

CONCLUSION

Nutrition and the nutrition process are very important for the infants. The mother's having a balanced and regular nutrition during the pregnancy process, starting to breastfeed immediately after the birth and to have supplementary food with the breastmilk starting from the sixth month are necessary facts for the nutrition. When supplementary

food species are given, their nutritional value and role in growth should also be considered.

Babies may be introduced to fish between 6-7 months old. For babies with a food allergy history in their family, fish meat should not be started before the 12th month (Anonymous, 2012). Supplementary food should be given to the babies as two meals in the 6th-8th months and three meals in the 9th-11th months. The fish to be given to the babies must be cooked thoroughly (Anonymous, 2014), its bones should carefully be picked out, and it should be served as grinded or added into the vegetable soup (MEB, 2013). Oily fish such as salmon, tuna, sardines, mackerel and herring include high-omega-3 polyunsaturated fatty acids, which are important for neuromotor development. Especially sea fish are good sources of iodine (Anonymous, 2012).

Nutritional deficiencies cause slowing in terms of development and growth in infants. For that reason, it is very important for mothers to develop themselves in balanced and adequate nutrition. In order to gain permanent eating habits, education should be given at early ages and conscious practices should be done.

The fish meat is in the most valuable food group with its nutritive value and richness in omega 3 fatty acids. Early childhood consumption of fish meat is very important for healthy development. As a result, in early childhood, where development is most rapid in infants, consumption of fish prevents numerous diseases as well as helping to maintain health by providing growth and development.

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