

ROLE OF NUTRITION AMONG CHILDREN SIX YEARS OF AGE AND YOUNGER AND ROLE OF NURSES TOWARDS THEIR NUTRITION

Literature review

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Abstract

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| Author(s) Sapkota Puspa Sharma Laxmi | Type of publication Bachelor's thesis Number of pages: 47 | Published Spring 2021 |
| Title of publication Role of nutrition among children six years of age and younger and role of nurses towards their nutrition. Descriptive literature review | | |
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| <p>Many parents and caregivers are confused about healthy nutrition of their children. Many children eat more food than what they need while others eat less food than required. Both lead to health problems, so it is important to educate parents about good nutrition of children.</p> <p>The aim of this thesis is to find out the role of nutrition among young children through a nursing perspective and recognize the role of nurses towards their nutrition. The purpose is to increase the knowledge about the role of child nutrition towards families and pediatric nurses, prevent malnutrition, and support caregivers in child development. The thesis has two questions: what is the role of nutrition among children six years of age and younger? and what is the role of nurses towards their nutrition? A descriptive literature review was selected as a method and eight articles were analyzed by using thematic analysis.</p> <p>For the development and growth of children, breastfeeding is the most effective nutrition. The overall activities of children are influenced by a healthy diet. Besides, different vitamins help in the development of the brain, maintain healthy bones, and prevent the death rate in children. Good nutrition avoids many physical and mental problems, helps to manage chronic illness and cope with stress. Nurses have an important role in supporting a balanced diet for children.</p> <p>Finally, concluded that there are major nutritional roles in children such as growth and development, multiple disease prevention, early awareness of malnutrition, and overweight. In the nutritional welfare of children, primary nursing roles include promoting a healthy diet, offering dietary counselling and nutrition therapy by educating parents and families. To improve the nutrition of children, more evidence-based research is required and knowledge about nutrition of children should be provided to their families by nurses.</p> | | |
| Keywords: Pediatric nutrition, food nutrition, 0-6 years old child, malnutrition, role of nutrition, nursing perspective. | | |

Tiivistelmä

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| Työn nimi Ravitsemuksen rooli kuuden vuoden ikäisten ja sitä nuorempien lasten keskuudessa ja sairaanhoitajien rooli ravitsemuksessa ja hoitotyön näkökulmasta. Kuvaava kirjallisuuskatsaus | | |
| Tutkinto-ohjelma Sairaanhoitaja (AMK) | | |
| Tiivistelmä Monet vanhemmat ja hoitajat ovat mietтелиitä lapsen terveellisestä ravinnon saannista. Monet lapset syövät enemmän kuin mitä tarvitsevat ja toiset syövät vähemmän. Molemmat johtavat terveysongelmiin, joten on tärkeää kouluttaa vanhempia lapsen hyvästä ravinnosta. Opinäytetyön tavoitteena on selvittää pienten lasten ravitsemuksen rooli ja tunnistaa sairaanhoitajien rooli hoitotyön näkökulmasta. Tarkoituksena on lisätä tietoa lasten ravitsemuksen roolista perheille ja lasten sairaanhoitajille, estää aliravitsemusta ja tukea omaishoitajia lasten kehityksessä. Opinäytetyössä on kaksi tutkimuskysymystä: Mikä on ravitsemuksen rooli kuuden vuoden ikäisten ja sitä nuorempien lasten keskuudessa? Entä mikä on sairaanhoitajien rooli heidän ravitsemuksensa? Menetelmäksi on valittu kuvaavan kirjallisuuskatsauksen ja kahdeksan artikkelia on valittu, jotka analysoitiin temaattisen analyysin avulla. Imetys on tehokkain ravinto lapsen kasvulle ja kehitykselle. Terveellinen ruokavalio vaikuttaa lasten toiminnan yleiseen suorituskykyyn. Lisäksi erilaiset vitamiinit auttavat aivojen kehityksessä, ylläpitävät luun terveyttä ja estävät lasten kuolleisuuden. Hyvä ravinto välttää monia fyysisiä ja mielenterveydellisiä ongelmia, auttaa hallitsemaan kroonista sairautta sekä edesauttaa selviytymään stressistä ja taistelemaan sairauksia vastaan. Sairaanhoitajilla on tärkeä rooli lapsen tasapainoisen ruokavalion tukemisessa. Lopuksi todettiin, että lapsen puutteettomalla ravinnolla on merkittäviä rooleja, kuten riittäväkasvu ja kehitys, sairauksien ehkäisy ja varhainen tietoisuus aliravitsemuksesta ja ylipainosta. Ensisijaisesti sairaanhoitajien tehtäviin lasten ravitsemuksellisessa hyvinvoinnissa kuuluvat terveellisen ruokavalion edistäminen, ruokavalion neuvonta ja ravintoterapia kouluttamalla vanhempia ja perheitä. Lasten ravitsemuksen parantamiseksi tarvitaan enemmän näyttöön perustuvaa tutkimusta, lisäksi lasten ravinnosta tulisi antaa tietoa heidän perheilleen esimerkiksi sairaanhoitajien kautta. | | |
| Avainsanat: lasten ravitsemus, 0–6-vuotiaat lapset, aliravitsemus, ravitsemuksen rooli, sairaanhoitajan näkökulma | | |

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1 INTRODUCTION

Nowadays the majority of guardians are confused about nutrition intake for their children, especially what children eat, how much nutrition they need and resources of nutrition. They wonder whether the children are getting enough vitamins and necessary nutrients required for their development. (American Academy of Pediatrics 2016a.)

Nutrition is an important role in the development of physical and psychological growth of young children (American Academy of Pediatrics 2016a). Millions of children are eating more than what they do not need, and millions are eating too little of the requirement. At least one in three children under five are not developing well globally due to malnutrition and at least one in two children under five suffer unseen hunger from important vitamin and other necessary inadequacy nutrients. Child overweight can bulge to the early outbreak to type-2 diabetes, depression, and is a powerful predictor of adult obesity which will have a serious economic and health consequences. (Unicef 2019, 8.)

Full breastfeeding of the child is recommended until the age of four to six months. For full-term and average weight babies, breast milk is adequate as the primary food before the age of six months. In addition to this the child needs vitamin D. (THL 2019.)

Improved health outcomes in young children have long-lasting health-positive benefits, including increased output, efficiency, and a lower percentage of non-communicable diseases throughout the years. In the earliest years, it is mostly the family who commits for the guidance in the growth of child. Many parents and other caregivers need support for this. (World Health Organization 2020.) Therefore, guiding parents and pediatric nurses are fundamental for complete health and wellbeing of children.

This thesis is internationally focused, and it covers studies conducted between the year 2010–2020. It is focused on food nutrition among children six years of age and younger such as infants, toddlers, and pre-schoolers. It also focuses on the role of nurses towards nutrition of young children.

Based on the evidence the important roles of nursing in child nutrition were perceived. In this thesis, descriptive literature review is written on the evidence-based, prevention of malnutrition in young children, the importance of food nutrition among infants, toddlers, and pre-schoolers from a nursing perspective. It also dives into factors of nutrition such as energy nutrients, minerals, and vital vitamins. The thematic analysis will be used for data processing.

The aim of this thesis is to find out the role of nutrition among young children through a nursing perspective and recognize the role of nurses towards their nutrition. The purpose is to increase the knowledge about the role of child nutrition towards families and pediatric nurses, prevent malnutrition, and support caregivers in child development.

2 PEDIATRIC NUTRITION

Good nutrition is fundamental for physical growth, mental progression, productivity, well-being, and health across the entire cycle. Some of the essential types involves breastfeeding when caring for babies and young children. Useful feeding habits build-ups caregiver bonding and psychosocial growth. (World Health Organization 2020.)

Infants (under 12 months), in this period parents get the most crucial information from their child such as how child prefer to be cared, interact, hold, and supported. This period levels the most familiar thoughts and questions that come out within the first month of childhood. During this period somatic and motor development of children will be fast. (American Academy of Pediatrics 2020a.)

Toddlers (one to three years old) are growing from early childhood towards the preschoolers. In this stage changes in somatic and motor growth will be delayed as compared to infants. However, some enormous mental, communal, and emotional changes can occur. Toddlers attempt to walk and run frequently. (American Academy of Pediatrics 2020a.)

Pre-schoolers (three to five years old) grow into pre-schoolers from infancy. Somatic growth and motor development slowdown in this period, but social and emotional growth changes enormously. (American Academy of Pediatrics 2020 a.)

Best lifestyle choices such as a balanced diet and a proper amount of nutrients build an appreciable contribution to date rate and illness in the UK (Patience 2014). The importance of nutrition in childhood cannot be ignored. Infant breastfeeding and the availability of food for proper nutrition are essential. (Patience 2014.)

In the stage of infant stage, the child receives nearly all nutrition from milk. Milk can be breast milk, breast milk substitutes, or a mixture of both kinds of milk. During the first year of life, the infant receives nearly all nutrients from breast milk or formula milk. At around six months, many babies can take a small amount of food for example oat milk, rice, iron contained foods, different kinds of vegetables and fruits. (American Academy of Pediatrics 2016 a.)

Generally, while beginning to add food to babies, reducing the fat amount is not recommended. Even though AAP (American Academy of Pediatrics) recommended fat limitations in a few babies is best. Decreasing the proper amount of fat is not suggested because fat helps in the growth of babies' brains and nerves, especially for under two age of old. (American Academy of Pediatrics 2016a.)

Breast milk is a huge source of nutrition. Infant breast milk is also partially replaced by formula milk, but it is not as beneficial as breast milk. Infants are unable to get immunity from motherly antibodies and do not support neurological development in the same way as breastfeeding supports. (Patience 2014.) Image 1 illustrates how breastfeeding benefits the mother and infant.

How breastfeeding helps the mother and child

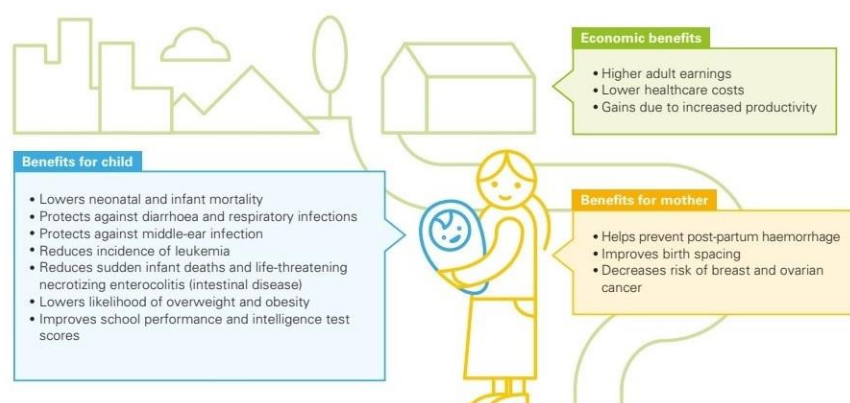


Image 1 How breastfeeding helps the mother and child (Unicef 2019)

When a baby is ready to get solid food (in six months) parents should provide the food, it does not mean that breast milk is completely stopped. Parents can feed both breast milk and as well as soft solid food. When a child becomes six months old, they need extra nutrition like vitamin D and iron. Only breast milk and formula milk are not enough for the proper development of the child. Parents should provide healthy food containing adequate amounts of nutrients and energy to help the child grow and to make the child active. Most parents begin with vegetables, fruits as well as meat. Meat is good source of iron. Parents could provide their children with the same meal as what they eat in family meals, so parents do not need to buy commercial food for them. When children start to eat food regularly, the amount of breast milk can decrease. They have a tiny stomach, but they need a huge amount of nutrition and energy. Parents need to be aware of and provide food with high nutrient and energy. (Patience 2014.)

When a baby becomes eight months usually, they need three meals and two nibbles (snacks) every day. When child become one-year-old food is the main source of nutrient than milk. Food is recommended after the first birthday of a child. Parents have to make meal plan in advance for their child for example food divided into four different parts: milk and milk products, green vegetables and fruits, carbohydrates, and protein (meat and non-meat protein). Fats are important for children, Good fat should be chosen for example fat from real sources such as nuts, fish, dairy products, and olive oils. A child's allergy should

be also taken into consideration. The department of health (DH) suggests that vitamins A, C, and D are important from six months of the child to four years in the UK especially for those who have less than 500 MLs of infant formula. (Patience 2014.) Getting nutrition in early childhood helps in the growth and development of a child as well as ensures the healthy life of an adult and older people. In UK public health workers are responsible for the good nutritive begin in child life. (Patience 2014.) The infant nutrition plate model is shown in image 2.



Image 2 Plate model (Ruokavirasto VRN 2014)

2.1 Nutrition of toddlers and preschoolers

Toddlers and pre-schoolers develop in spurts and their hunger comes and goes very rapidly. Some days they might take a huge amount of food and a low amount the next day. By providing them an adequate amount of food, it is easy for them to get a sufficient amount of food daily. (American Academy of Pediatrics 2016a.)

Generally, toddlers, it can be noticed that child starts to take less food after his//her first birthday because hunger is reduced. The child does not want to eat more after taking few bites of food. Sometimes they don't want to come to even a dining table. Parents might think a child should eat more than what they eat. There is a reason for that, the growth rate is slow, and does not need too much food even though the child is more active in this stage. (American Academy of Pediatrics 2020b.)

Preschool children may appear to be in steady motion much of the time. Since they use body parts to communicate, they convey the emotions they do not yet present through words. Their movements from body help to understand many things, so pre-schoolers can now have a positive attitude about eating and to get enough energy from food. (American Academy of Pediatrics 2020 c.)

It is good to be conscious as parents when supplying food to preschoolers. There is no need to minimize the fat in the meal. Research has found that a low-fat diet contributes to the child to excessive mass gain-mainly whether extra sugars are recorded with dietary fats. Giving priority to mind intelligent fats on the meal and decreasing the trans-fat such as fat from bakeries and fried foods is necessary. Healthy fats are important for a health-balanced meal and as well as in the growth and development of children. Unhealthy fats can be replaced by healthy fats for example by olive oil, fish oil, and omega three oil. It is important for the growth of the brain as well as a benefit for the heart also. Healthy meals include the source of protein, much non-starchy vegetable, whole grain food, and seasonal foods. (American Academy of Pediatrics 2016b.) Image 3 shows the daily food checklist of children age between two to five years old.

Healthy Eating for preschoolers Daily Food Checklist



Use this Checklist as a general guide.

- This food checklist is based on average needs. Do not be concerned if your child does not eat the exact amounts suggested. Your child may need more or less than average. For example, food needs increase during growth spurts.
- Children's appetites vary from day to day. Some days they may eat less than these amounts; other days they may want more. Let your child choose how much to eat. Throughout a day, offer amounts shown below.

| Food group | 2 year olds | 3 year olds | 4 and 5 year olds | What counts as: |
|---|-------------|--------------|-------------------|---|
| Fruits Focus on whole fruits | 1 cup | 1 – 1½ cups | 1 – 1½ cups | ½ cup of fruit? ½ cup mashed, sliced, or chopped fruit ½ cup 100% fruit juice ½ small banana 4-5 large strawberries |
| Vegetables Vary your veggies | 1 cup | 1 – 1½ cups | 1½ – 2 cups | ½ cup of veggies? ½ cup mashed, sliced, or chopped vegetables 1 cup raw leafy greens ½ cup vegetable juice 1 small ear of corn |
| Grains Make half your grains whole grains | 3 ounces | 3 – 5 ounces | 4 – 5 ounces | 1 ounce of grains? 1 slice bread 1 cup ready-to-eat cereal flakes ½ cup cooked oatmeal, rice, or pasta 1 tortilla (6" across) |
| Protein Foods Vary your protein routine | 2 ounces | 2 – 4 ounces | 3 – 5 ounces | 1 ounce of protein foods? 1 ounce cooked meat, poultry, or seafood 1 egg 1 Tablespoon peanut butter ½ cup cooked beans or peas (kidney, pinto, lentils) |
| Dairy Choose low-fat or fat-free milk or yogurt | 2 cups | 2 – 2½ cups | 2½ cups | ½ cup of dairy? ½ cup milk 4 ounces yogurt ¾ ounce cheese |

Some foods are easy to choke on while eating. Children need to sit when eating. Foods like hot dogs, grapes, and raw carrots need to be cut into small pieces the size of a nickel. Be alert if serving 3- to 5-year-olds foods like popcorn, nuts, seeds, or other hard foods.

There are many ways to divide the Daily Food Checklist into meals and snacks. View the 'Meal and Snack Patterns and Ideas' to see how these amounts might look on your preschooler's plate at www.ChooseMyPlate.gov/preschoolers-meal-and-snack-patterns.



Image 3 Daily food checklist (Department of agriculture GOV.US 2016)

2.2 Malnutrition forms in young children

Malnutrition of children in the 21st century has three key elements. The first one is the continuing undernutrition threat. The second central issue is hidden hunger inadequacy in important vitamins and minerals like vitamins A and B, as well as zinc and iron. Unseen and hidden hunger steals energy and health of children and in some cases even their lives. The

third major part is overweight, obesity in its more serious form. All these forms of malnutrition affect children, families, and communities. Malnutrition of children in the 21st century is continually highlighting the fact that many food systems administer children too little of the food they acquire and too much of which they do not need. (Unicef 2019, 36.)

Unhealthy nutrition influences malnutrition in early childhood. 59 % children aged six to 23 months are not nourished fish, milk products, eggs, or meat. (Unicef 2019, 8.) It is important to first work on improving wellbeing between birthtime and the first week of life to secure that each child lives and develops to fulfil its full potential. Insufficient nutrition and poor access to safe water and sanitation are some of the negative factors. (World Health Organization 2020.)

Chinese young children are under the strain of dual malnutrition-simultaneous of over and undernutrition. Undernutrition terms as stunting and or underweight and overnutrition terms as overweight and obesity. Financial growth is good for better child nutrition. Evidence of china health and nutrition survey (CHNS) shows that nutrition status of children has regularly improve even though still there appear some issues for example simultaneous of over and undernutrition and increase in overweight and obesity in urban and remote areas. (Zang, Becares and, Chandola 2016.)

Research shows that there is a risk of poor development for those children who suffer from overweight and stunting together. Besides simultaneous overweight and stunting in child results in dual undernutrition issues, infection issues, and overweight related illness. Due to this, there is a dual strain of illness in Chinese children. (Zang, Becares, and Chandola 2016.)

Nearly half of all deaths are due to under-nutrition in children under five. 200 patients were taken in the study of nutritional assessment of children between six months to five years old. The result shows that 108 out of 200 patients were male and 92 were females. Allocation of patients was in the age group between 13 and 36 months. According to SAM (severe acute malnutrition) and MAM (moderate acute malnutrition) allocating patients shows 127 plunges under SAM and 73 under MAM. (Gandhi, Gulabani, Joshi, Pathak, Sharma &Yadav 2017, 42.)

The principal provider of the care is the mother, especially during the first five years. The form of care she provides depends on her understanding and knowledge of the certain form of health care and basic nutrition. This can have an impact on malnutrition of children. Practise study and knowledge inclination were done among 50 mothers. The outcome indicates that mothers have less knowledge of what to be added in complementary feed,

immunization value, and hazard signs signifying illness. (Gandhi, Gulabani, Joshi, Pathak, Sharma & Yadav 2017, 43–44.)

Firstly, tens of millions of children continue to suffer from undernutrition. Its occurrence is noticeable in stunted bodies of children affected by the loss of proper nutrition during the important first 1000 days. These children carry the risk of early stunting for their entire lives and their complete physical and rational potential will never be reached. Undernutrition is also apparent in the wasted bodies of children when situations like poor feeding practices, food shortages occur. There were 149 million children under 5 stunted in 2018 and nearly 50 million were wasted. Wasting describes an infant who is too thin for their height. (Unicef 2019, 17–18,40.) Image 4 shows prevalence of children under 5 who are not growing well, stunted, wasted or overweight in 2018.

Secondly, the insufficiency of important minerals and vitamins which are usually also referred to as micronutrients deprives strengths of children at every stage of life. Hidden hunger is often noticed when it is too late to do anything. It has a negative impact on the health and wellbeing of children, women, and young people. Unicef reports that according to the currently available data at least 340 million children under five struggles from inadequacy micronutrient. (Unicef 2019, 18.)

Thirdly obesity and overweight of children imply both in infancy and in later life. They can cause a variety of medical issues throughout childhood such as orthopaedic, musculoskeletal, and gastrointestinal complexity. Behavioural and emotional problems, as well as early increased risk of type 2 diabetes, may occur. Childhood obesity is a steady indicator of adult obesity which can have significant health and economic implications. In each continent, child overweight has risen. Based on current studies the rate of overweight under five years old overweight will grow from 40 million children to 43 million by 2025. Overweight affects especially low-and middle-income countries which is remarkable since often it is seen as an issue only in wealthy countries. Nearly half of the overweight of world under-fives lives in Asia and one quarter in Africa. (Unicef 2019, 44.)

The length equivalent weight seen on the growth curves distinguishes obesity and overweight. When a pre-school child weighs >20 percent more than the average weight, it is seen as obese. If the weight is 10-20 percent greater than the normal, it is seen as overweight. Obesity and overweight can be measured using BMI or body mass index values. (Terveyskylä 2020.)

The factors of obesity are both genetic and growth environment. The causes of obesity may stretch back to the fetal period and early health and nutritional well-being. Lack of exercise and easily accessible high-energy foods predispose to the development of overweight. The

most common illness is hypothyroidism which is accompanied not only by obesity but also by a slowdown in height growth and other symptoms such as constipation, fatigue, and cold. Thyroid medication does not alter a child's weight unless the child has a thyroid disease deficiency. Many metabolic or hormonal disorders are causes of overweight which are much less common. (Terveyskylä 2020.)

Obesity treatment is worthwhile, as it can eliminate the occurrence of complications related to obesity if the child manages to lose weight any closer to average weight. In addition to weight loss, increased physical activity and healthy nutritional changes decrease health problems and help to maintain normal adult weight. (Terveyskylä 2020.)

Obesity changes metabolism. The levels of insulin in the blood and sugar may raise and LDL cholesterol as well and particularly triglycerides. The amount of good cholesterol named HDL diminishes in the blood. A large percentage of obese children have fatty liver, which is indicated by elevated liver value ALT. In many children who are overweight generally, systolic blood pressure is too high but diastolic known as lower pressure is less normal. Systolic blood pressure in teenagers should not increase >130 mmHG and > 120 mmHG before puberty. The corresponding limits are 80mmHG and 75mmHG for diastolic blood pressure. Besides, obesity is often linked to psychosocial problems. A child who is overweight may be bullied in kindergarten and school which can sometimes result in exclusion and isolation. (Terveyskylä 2020.)

Screening and treatment for obesity occur mainly in child health care centre and health care at school. The easiest way to treat obesity is through your familiar nurse clinic or hospital. A doctor, physiotherapist, psychologist, and nutritionist will also be included in the treatment if the treatment is not effective enough. Specialist treatment is used to treat children and adolescents whose obesity is extremely serious and is suspected to be due to another disease. In the treatment children or adolescents do not receive medications or withstand obesity surgery. The living condition and lifestyle of the family including eating and exercising habits will be discussed as well as family diseases especially obesity and diabetes. The whole family should be included in the treatment process. (Terveyskylä 2020.)

Treating obesity in children and adolescents is based on improvements in lifestyle. Eating and exercising habits are the most important. Setting realistic goals for lifestyle changes not so much for weight is important. For children and young people, it is important that the family of child and young people commit to caring. The following points are worth paying attention to such as reducing fast food and snacking, reducing the sugar and fat content of food, use of more vegetables, fruits and berries, regular healthy breakfast, good diet and high fiber content in the diet, evading the use of sugary drinks, family meals and participating in school

meals. In the treatment process of the overweight child, the purpose is to increase physical activity and reduce screen time such as time spent on digital platforms. Encouraging children to try out different forms of exercise to find which sports they prefer is very important. (Terveyskylä 2020.)

Treatment of obesity in people of all ages is always challenging and obesity in children, and adolescents tend to progress into adulthood. Accordingly, efforts should be made to prevent it. Consideration should be paid to children of overweight or obese parents since obesity often occurs in the same family due to heredity and the same lifestyles. Families should be encouraged for healthy lifestyles. Many studies have found that children who receive breast milk have a lower incidence of obesity later than those who receive substitute milk. Breast-feeding should also be preferred for this reason. Regular exercise habits, a healthy recommended diet, and adequate sleep intake are important. (Terveyskylä 2020.)

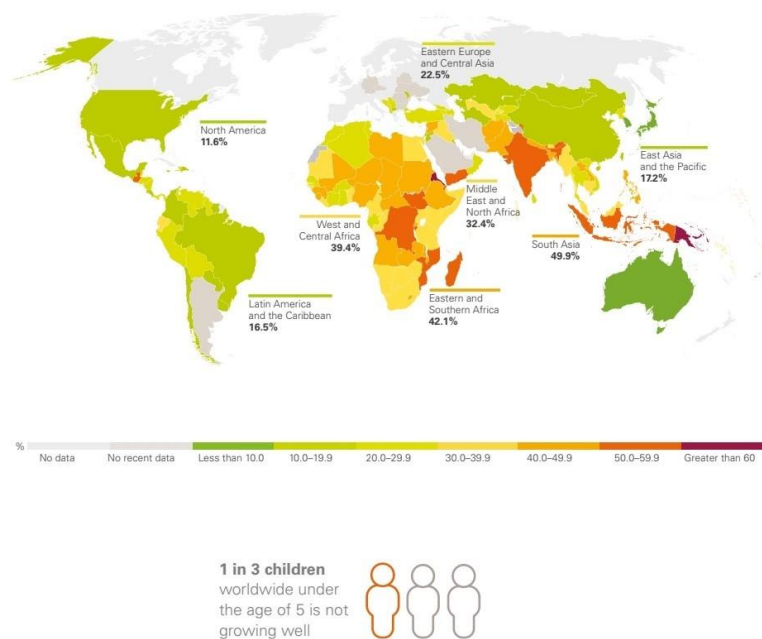


Image 4 Prevalence of children under 5 who are not growing well, stunted, wasted or overweight, 2018 (Unicef 2019)

2.3 Factors of nutrition

Children require more energy with size compared to adults and appropriate intake of energy nutrients must be provided. Carbohydrates are the most abundant energy source in our diet, approximately half of them emerge from daily energy intake as well as in children. In the infant stage lactose is the most essential carbohydrate which is a carbohydrate in breast milk and other dairy products. During childhood, the most preferred carbohydrate sources

are full grain cereals, vegetables and potatoes, fruit and berries, and low-fat dairy products. There should be less pure sugar or sucrose. Increased use of sucrose rapidly increases energy consumption, negatively affects dental health, and reduces essential nutrients for a child's development and growth. Sugary soft drinks or energy drinks are not recommended for all ages. (Terveyskylä 2020.)

About one-third of energy should come from fats, and less than one third from saturated fats. At room temperature, saturated fats are solid and are considered hard fats. Double bonded fats are considered unsaturated fats. In Finland, saturated fat consumption such as animal/milk fat overtakes the recommendation. Therefore, portions of margarines and vegetable oils should be selected to butter, and butter-based, skimmed milk, and other low-fat dairy products. It is also recommended to use low-fat meat and chicken. As a bread fat, it is recommended to use vegetable margarine and while cooking vegetable oil, running or soft vegetable margarine. Rapeseed oil is rich in the only essential fatty acids for our body. They are polyunsaturated fats which are named linoleic and alpha-linolenic acid. Fish also has a lot of polyunsaturated long-chain fats and it is recommended to eat fish at least two days a week. (Terveyskylä 2020.)

In Finland intake of protein in children is sufficient. To minimize the amount of animal protein, it is advisable to have an organic vegetarian food day a couple of times every week. Excessive protein intake in early childhood may increase the risk of later obesity. Red meat and sausages are not part of the daily diet. Poultry meat is more suggested over red meat. Healthy protein sources are dairy and milk products, eggs, cereals, and legumes. (Terveyskylä 2020.)

Fiber is one of the key factors of nutrient which helps to prevent heart diseases and constipation. For children, constipation is seen as a general issue. A Sufficient amount of fiber in a daily diet makes children healthier. Motivation and guidance of parents are needed for children to choose the proper amount of fiber for example vegetables that are darker in colour, barley, beans, fruits, and as well as berries. (American Academy of pediatrics 2016a.)

Calcium is the most important key factor of nutrition. Calcium plays a big role in developing the teeth and bones of children. Calcium can be obtained from milk. As a nurse, it is vital to guide and encourage children to drink milk. We must take into consideration that some children might be affected by milk allergy as well as deficiency of tolerance of lactose. In such cases lactose-free milk, oat milk, tofu soya-beans, nuts or calcium strengthen juices as well as fruits and green leafy vegetables can be offered. (American Academy of pediatrics 2016a.)

Iron is an important nutrient for immune, neural production, and cell growth as well as in the control of exercise and energy metabolism. It is a necessary mineral for the body. In 2011 around 300 million children worldwide had anaemia. The most common cause of anaemia is thought to be by a deficiency in iron. Oral iron supplementation has been regularly recommended by WHO as one of the interventions which can reduce the occurrence of anaemia. Regular iron supplementation for infants and young children is highly recommended. For children aged six to 23 months living in an environment where anemia is relatively common, elemental iron is suggested to give ten to 12.5 mg daily for three constant months in a year. For preschool-age children aged 24–59 months, 30 mg elemental iron is recommended for three constant months in a year. (World Health Organization 2016.)

All children must receive vitamin D supplementation daily during childhood. It can be given to a baby from two weeks of age. The recommended intake of vitamin D for children under one year of age is 10 micrograms per day. 10 micrograms of vitamin D can be given every day of the year if the baby is fully breastfed or if the baby is receiving less than 500 ml infant formula or weaning product a day. It is recommended to give vitamin D in the form of drops for children under one year of age. When the child is one year old 10 micrograms of vitamin D is given on a daily basis. Children between two to 17 years old need to get seven and half micrograms of Vitamin D a day throughout the year. The use of a vitamin in addition to vitamin, dairy products, and fats is safe. There is no risk of increased intake of vitamin D in a normal diet. (THL 2019.)

Human cells require vitamin B12 or cobalamin and folic acid to form nucleic acids (DNA). Vitamin is present in only animal origin food. The main sources of vitamin B12 are liver, meat, and dairy products. Many times, a normal diet includes very small quantities of vitamin B12 that a person requires. People who follow a rigid vegetarian diet may have vitamin B12 deficiency supplementation is recommended. Deficiency of vitamin B12 is treated with vitamin preparation. (Terveyskirjasto 2019.)

| Vitamin | Age | Amount |
|----------------|--|---------------|
| Vitamin D | Two weeks - One year | 10 mg/day |
| | Two years - Seventeen years | 7.5 mg/day |
| Iron | Six months - Twenty-three months | 10 – 12.5 mg |
| | Twenty-four months - Fifty-nine months | 30 mg |

Table 1. Vitamin with age and amount

2.4 The role of pediatric nurse and family

Nurses play an important role in caring for children, preventing malnutrition, and treating those who are already at risk of malnutrition. Nurses are experts in the regular guidance of children's weight and height to notice signal of malnutrition at an early stage, encourages the mothers to breastfeeding and feeding, providing vitamins, regular health check-up, and in providing the guidelines and counselling to the family about appropriate balance in dietary. (Nursing for nutrition 2013, 6).

Breastfeeding is most important for fighting against malnutrition and in reducing the rate of child mortality. Well trained nurses are key role to explain the advantages of breastfeeding as well as in the management of a balance diet. Expert nurses are helping those women who have their first baby and are not well skilled in how to care for the child. Nurses assist the mothers on how to feed the child after birth and support continues until the child becomes an adult. (Nursing for nutrition 2013.)

Appropriate nutrition plays a key role in the prevention of different diseases, helps in the recovery as well as in continuing healthy life ahead. Pediatric nurses who are working in hospital and day-care need to have daily contact with child/child patients. Therefore, it is essential to know the importance of nutrition and to be able to monitor the healthy diet of the patients and as well as to support them in choices of healthy foods. Healthy food plays vital role in prevention of long-term diseases for example heart diseases and diabetes.

Nurses working in hospitals need to pay attention, especially to a balanced diet. This way patients may recover as soon as possible. While working at school, they focus on the prevention of diseases for example by providing nutritional education. The Nurse may educate how more sugar in the diet may affect type 2 diabetes. Nutrition for diabetes is vital. Overweight is a risk factor for diabetes. More sugar-containing food in the diet is a fast track of

obesity in children than in the whole grain diet. Therefore, the role of pediatric nurses in day-care in proper nutrition management for their meals is important. (The role of nurses and nutrition in healthy patients 2018.)

The family is also the most important place for the growth of young children. The resources of families are meaningful to the wellbeing and health of all family members. It is essential to recognize the importance of eating at home on a regular basis which also helps to bind the family. It helps to work together to find effective solutions for a good diet. Finland advocates transparency in health. Children are provided with food in the school and early childhood education programs. (THL 2020.)

Eating habits of families are part of the overall well-being of the family. It includes a regular schedule and use of the time of rest such as sleep, management of screen time, and regular exercise. Regular meals and care for the children is a component of social, physical, and mental well-being. For young infants, hunger is a strong feeling that they perceive as pain. When the hunger is cued by giving the baby food, the child's first feeling of safety is formed. The feeling of basic safety is also enhanced in children by fulfilling their food-related needs and by regular mealtimes. The warm social relationship between the child and the parent at meals helps the child create a healthy self-image as an eater and avoids the development of eating-related problems. Positive mealtime interactions and joy created by food leads to an improvement of the dietary habits of children. Children need positive feedback and support that shows that they are making progress. (THL 2020.)

As many parents know toddlers and infants can be choosy eaters. The choices for food and taste can transform from week to week and almost always parents provide what the child favors. The instinctive choice of young children for sweet foods aims to support higher consumption of commercial snack foods including such as cookies, sweets, and cakes. A study of 2016 on feeding habits among young children in Dakar, Dar es Salaam, Kathmandu, and Phnom Penh concluded that the reason mothers feed their children with commercial snack foods was because their children "like it". The study discovered that young children in all four cities were much more inclined to eat commercially processed snack foods than micro-nutrient-rich foods like leafy green vegetables. After reading this thesis the family will obtain important nutritional information for young children. It will help them to make healthy everyday food choices in the family. (Unicef 2019, 78.)

Wellbeing is an individual's overall understanding of the past, present, future self, and the immediate environment which consist of the mental, physical, social, spiritual, and all other aspects of life (Ashton & Jones 2013,4).

Individuals tend to experience wellbeing at different levels despite being in similar circumstances. It can be highly influenced by eco-social status in life as well as personal emotions, psychological conditions, employment status, housing conditions, educational & cultural background and other various aspects but is not fully dependent on them. (Ashton & Jones 2013, 4.)

The role of parents is most important in early childhood as well as in the adults. Parents provide not only money as well as they provide all type of support for their child. They spend time with them. It gives a positive impact on the growth of children, strengths as well as wellbeing. Single mother, particularly if she works, will not be able to provide her children with enough time. Wellbeing of children also depends upon parental mental health, type of family, and relationship with them. Good relationship influences a positive impact on the wellbeing of children. (Waldfogel, Craigie and Brooks-Gunn 2011.)

Nurses are responsible to support parents and families in their real caregiving and finding the good choices for their child in health care place as well as outside the health care place. Nurses support the parents by giving therapeutic care, for example, educating the parents about prevention, diagnosis, and treatment of diseases in advance. Nurses have different roles, for example, educating parents in childcare, feeding, feeding problems, encouraging, facilitating family support, and appreciating them. (Hockenberry & Wilson 2019, 7-9.)

Nurses help to find the need for the child and support the family in making the future plan. Every nurse must know the significance of the prevention of illness. A nursing plan should cover an analysis of all factors of child growth and development as well as good nutrition. Providing guidelines and educating the parents are the most significant part of the prevention of children from poor nutrition as well as from other diseases. Nurses can support and counsel the parents for example by providing emotional support and participating in problem-solving. (Hockenberry & Wilson 2019, 7-9.)

3 THE PURPOSE AND AIM OF THE THESIS

The purpose of this thesis is to improve knowledge about the role of child nutrition towards families and pediatric nurses, prevent malnutrition, and support caregivers in child development. Parents, young children, and pediatric nurses will benefit from early nutrition education strategies in places like child health care centre, daycare centers, and pediatric wards.

The aim of this thesis is to discover the role of nutrition among young children from a nursing perspective and recognize the role of nurses towards child nutrition. This study states the following research questions.

What is the role of nutrition among children six years of age and younger?

What is the role of nurses towards nutrition of the child?

4 METHODOLOGY AND DATA SEARCH

4.1 Descriptive literature review

The descriptive literature review also known as traditional or narrative literature review analysis and outlines a body of literature and summarizes the findings on the subject. The body of literature consists of important studies and observations dealing with the subject area. Its initial aim is to contribute to the reader with a broad background for understanding present knowledge and understanding of new research. The literature review consists of five parts which are setting subject for review, searching for literature, literature collection, reading, and review, writing the review, and references. (Coughlan, Cronin & Ryan, 2008, 2.)

Firstly, while choosing the topic for review it is important to see how much literature and data are available on the chosen topic. It is important to ask questions to oneself such as why this topic is important and what am I trying to find out? Discussing with others for example clinical consultant or educating oneself about the topic can also help to recognize which areas of the topic the reviewer is concerned about and can assist to find how much information occurs on the topic. Reviews can be too long or too one-dimensional if topics are too broad. It is advisable, to begin with a focused and restricted topic and develop the review in the process. (Coughlan et al. 2008, 3.)

After selecting a thesis topic next step is to recognize and allocate relevant information in a constructive manner (Coughlan et al. 2008,3). According to Newell and Burnard (2006) while searching the literature, reviewers must consider a specific topics or questions. This way the results will be more focused. (Coughlan et al. 2008,4.) Younger (2004) says in present-day literature searchers use online databases and computers. A large amount of information is generated by computer systems, which can be accessed more efficiently and accurately than by use of a manual search. (Coughlan et al. 2008,4.) Many electronic systems deal with different fields of knowledge and it is essential to recognize the databases apply to the subject. Ely & Scott (2007) describes that keywords for study are one of the most common methods for identifying literature. (Coughlan et al. 2008,4.) Journals are usually regarded as more up to date than books as sources of knowledge, but books are still a reliable and appropriate source of information (Coughlan et al. 2008,4).

At the stage of literature collection, reading, and review, suitable literature should have been collected. First, it is best to read collected literature to get a better understanding of what they are about. Many articles that have been published include an abstract or a summary at the start of the article which could as well help to choose if the article is useful for subject.

It is advised that source and complete references should be included in the process after the article has been checked as it is hard to discover them at the later stage. Writing a concise overview of each article which can include capabilities, disadvantages, key ideas, and opinions of the publication are the final stage of the evaluation. It must be written in own words which can help to understand the content better. It also helps while writing the review. (Coughlan et al. 2008,4-5.)

In the process of writing the review, to build a proper academic paper one should have the potential to present the information. It is also recommended to avoid long, and complicated words. Sentences with one simple message should be kept as short as possible. The written report should include mainly an introduction, a body, and a conclusion. According to Hendry and Farley (1998), an abstract is a brief description of the findings of the review and is commonly initiated at last. (Coughlan et al. 2008,5-7). The meaning of the review should be included in the introduction. The key search terms and literature sources must be summarized. Inclusion/exclusion principles should be accurately explained.

The main body consists of analyses of the literature. It is appropriate for the reviewer not to involve personal opinions about the research quality. It should be written in own words and not include different quotes or definitions. The reviewer must understand the suited information. (Coughlan et al. 2008,5-7.) Beyea and Nicholl (1998) have mentioned that the text must flow naturally from one theme or section to the next to maintain stability and continuity. This can be obtained by summarizing each section or theme and identifying how it corresponds to the next one. A Mainly clear summary of the study explaining recent information should be concluded in the conclusion. (Coughlan et al. 2008,5-7.)

Finally, the literature review should include a complete bibliographical collection of the books, reports, journal articles that have been included in the work. Each quotation in the text must appear in the reference. In conclusion, a literature review is essential for the research to practice and may help understand a research approach. Through literature review, nurses can be engaged in improving patient care for example via evidence-based practices.

4.2 Data Search and collection process

Data selection for the descriptive literature review is done through electronic scientific database resources PUBMED, EBSCOhost, and Terveysportti. Articles were searched by using different keywords: "pediatric nutrition" OR "food nutrition" OR "0-6 years child",

“Malnutrition” AND “Child” AND “infant”, “Pediatric nutrition” AND “infant” AND “child”. Table two shows the result of searched articles by using electronic scientific database resources.

All data were searched from Mastofinna by using a different keyword for example keyword “lasten vajaanavitus” search was done through Terveystietä. It suggested five articles from which the most appropriate one was selected for the thesis topic after reading. Table 2 shows data investigation process.

By using “pediatric nutrition” AND “infant” keyword through EBSCO. At first 1,110 articles were found. After that it was filtered by full text, scholarly peer-reviewed journal, article form of paper was picked, English language, and full-text PDF. The date of publication was 2010-2020. There were 110 search results, and five articles were selected and read and finally one was chosen.

By using “pediatric nutrition” AND “infant” AND “child” keyword through EBSCO host. At first 2,202 articles were found. After that it was filtered by full text, scholarly peer reviewed journal, article form of paper was picked, English language and full text PDF. The date of publication was 2010-2020. There were 95 search results, and four articles were selected and read and finally one was chosen.

By using keyword “malnutrition” AND “Child” AND “infant” keyword through PubMed. At first 1100 articles were found. After that it was filtered by full text, scholarly peer reviewed journal, article form of paper was picked, English language and full text PDF. The date of publication was 2010-2020. There were 120 search results, and three articles were selected and finally one was chosen.

By using “Role of nutrition” AND “Child” AND “Nursing perspective” keyword through EBSCO host. At first 1300 articles were found. After that it was filtered by full text, scholarly peer reviewed journal, article form of paper was picked, English language and full text PDF. The date of publication was 2010-2020. There were 90 search results, and three articles were selected and finally one was chosen.

By using “pediatric nutrition” OR “food nutrition” OR “0-6 years child” keyword through EBSCOhost. At first 5,541 articles were found. After that it was filtered by full text, abstract available, year, language, age and 32 articles were found. After that filtered by using major heading nutrition, results came three articles, three articles were read and finally one was chosen.

By using “Pediatric nutrition” AND “infant” AND “child” keyword through EBSCOhost. At first 2,202 articles were found. After that it was filtered and came 49 articles, after that chosen

abstract available and got 12 articles, 12 articles were read based on abstract and full article, finally two articles were chosen.

Finally, 501 articles were found, among them 32 articles were chosen based on abstract and full articles. 32 articles were read together through and finally eight articles were selected. At the end of the thesis, the key findings of eight articles are given in appendices.

| Access/Keyword | Database | Finding | Finding based on abstract | Selected articles |
|--|--------------|------------|---------------------------|-------------------|
| "pediatric nutrition" OR "food nutrition" OR "0-6 years child" | EBSCOhost | 32 | 3 | 1 |
| s "Malnutrition" AND "Child" AND "infant" | PUBMED | 120 | 3 | 1 |
| "Pediatric nutrition" AND "infant" AND "child" | EBSCOhost | 49 | 12 | 2 |
| "Lasten vajaaravitsemus" | Terveystietä | 5 | 2 | 1 |
| "Pediatric nutrition" AND "Infant" | EBSCOhost | 110 | 5 | 1 |
| "Pediatric nutrition" AND "infant" AND "child" | EBSCOhost | 95 | 4 | 1 |
| "Role of nutrition" AND "Child" AND "Nursing perspective" | EBSCOhost | 90 | 3 | 1 |
| Total | | 501 | 32 | 8 |

Table 2: Data investigating process

4.3 Inclusion and exclusion criteria

Inclusion criteria is a key element which helps to find out answers to a research question. Exclusion criteria is that which helps to ignore the unsuitable data, incorrect data which may increase the risk for a result of the study. (Pneumol 2018.)

Table 3 shows Inclusion and exclusion criteria. In this thesis, only scientific data-based studies are considered which are published between 2010-2020 and excluded study published before 2010. Only study English and Finnish are included and other than English and Finnish are excluded. The thesis study is included for all countries and it is not focused on any specific countries. During data search, only on full text available was focused and available only abstract was excluded.

| Inclusion | Exclusion |
|---|--|
| <ul style="list-style-type: none"> • Study published between 2010-2020 • Languages: English and Finnish • Study focuses for all countries • Full text | <ul style="list-style-type: none"> • Study published before than 2010 • Others than English and Finnish • Not specific countries • Not full text (only abstract available) |

Table 3: Inclusion and Exclusion criteria

4.4 Thematic analysis

Thematic analysis is the most familiar method for data analysis in qualitative research. History shows that, it is confusing or debatable. This concept accommodates meanings of data, identify the data, data can be for example interview, report, program, script, or recorded. It is a sketch of data that is used extensively for the qualitative analysis of data. (Javadi & Zarea 2016, 2.)

Coding is a key point for topics, arguments, similarities, and differences in the data. Coding can be done by writing notes or underlining the text. According to the research question, it is important to read the transcript carefully, realizing and finding out the issue that comes from the data. Codes should be selected that answers the research questions or that are relevant to them. (Sutton & Austin 2015.)

Theme: indicates the specific part of research data or it is a key point which is extracted from the data, which is short and meaningful. Coding is the specific part of data and the theme is the result of coding. It is unknown about exactly the solutions to the questions "what ratio of the data is necessary for the emergence of the theme". (Javadi & Zarea 2016, 2.) It is an approach for recognizing, describing, investigating, and evaluating arguments within the circumstances, it explains data in brief (Braun & Clarke 2006, 6). There are six stages for the thematic analysis of the data (Javadi & Zarea 2016, 24).

In this thesis firstly, suitable articles were searched from different databases by using keywords. All data were read completely to get the main ideas and concepts. All articles were summarized to gain a deeper understanding. This method was time-consuming, but it was an important stage in getting familiar with the data.

Secondly, we coded the data, different colors were used for different codes. data with the same colors were coded to distinguish data with the same color that had the same form of ideas. Same color codes were put in one group and given one name for the same color codes. In this way, five sub-themes were found and named after coding with different colors for the analysis. From five sub-themes two main themes were found and named. Finally, the final evaluation and analysis were done through writing.

For example, growth and development is one of the sub-themes, before creating this sub theme same type of codes were collected in one group. Three codes (support battle bacteria and viruses by breastfeeding / preventing from diseases, influence the overall success of children with healthy diets, control poor nutrition that leads to general health issues) were

under one group. After this new name was given for three codes which is growth and development. Hashtag symbol (#) was used for articles references.

In the thematic analyzing process firstly, introducing to research data: In the first step to get familiar with the data literature, descriptive review is written, the research topic is found for example from different books, journals, and internet sources. All data should be read completely, repeatedly to get ideas, concepts, and important aspects from data. When reading data, it is important to go in-depth. This method is time-consuming, but it is a very important stage of getting familiar with study/data. It is important to go through the whole data before doing coding for getting the main points from the data. (Javadi & Zarea 2016, 4.) At the starting point of this about hundreds of studies regarding nutrition for the child and prevention from diseases were read.

Secondly bringing out the key points: After being familiarized with the data, next step is to code the data. Different codes can be found and different colors for different codes can be used. The code can be arranged, it depends on the type of analysis for example "inductive or theoretical" or it depends on the questions, which is built in the thoughts of the writer. (Javadi & Zarea 2016, 4.)

Thirdly seeking themes: The third step is to find out the themes from the codes. A similar type of codes can be now chosen in one set and give the name for the set Besides relation between different types of codes and themes should be considered. Picture, table, or map can be used to show the relationship between code and theme. (Javadi & Zarea 2016, 4-5.)

Fourthly reviewing themes: In this process comparison between the themes must be done. Some themes are not really theme because there is no sufficient information for supporting the themes. If possible, discarding them or mixing other themes with each other can be done. (Braun & Clarke 2006.) At last best understanding can be gained on what separates the themes and so they describe the whole study. (Javadi & Zarea 2016, 6.)

Fifthly defining and naming themes: In this step defining the themes is done. What themes tell and what kind of data is included by the theme should be defined. In this stage finding out a summary about each theme in one or two sentences is done. After defining, themes should be named, the name should be exact and clear. (Javadi & Zarea 2016, 6.)

Finally Writing the report: When there are a nice set of themes, finally final evaluation or analysis is done through writing and reporting. The main aim is that story of themes is provided accurately and clearly without repetition. (Javadi & Zarea 2016, 6.)

5 RESULTS

The intent was to find answers for the research question, “What is the role of nutrition among children six years of age and younger and role of nurses towards their nutrition. Besides, the findings will be identified in five sub-categories and there are two main categories which are shown in table 4. Sub-categories include growth and development, vitamin-based treatment of multiple diseases, early aware of malnutrition and overweight, prevention of illnesses, promoting a healthy diet through nurses. The main categories are the role of nutrition among young children and the role of nurses towards nutrition of the child.

| Codes | Sub-theme | Main-theme |
|--|--|--|
| Support battle bacteria and viruses by breast-feeding / preventing from diseases | Growth and development | The role of nutrition among children |
| Influence the overall success of children with healthy diets | | |
| Control poor nutrition that leads to general health issues. | | |
| Development of the brain. | Vitamin-based treatment of multiple diseases | |
| Good mood improvement | | |
| Maintain bone health | | |
| Inhibit the death in children | Early Aware of malnutrition and overweight | |
| Balance overweight | | |
| Support food allergy and vegan children | | |
| Avoidance of physical and mental ailments | Prevention of illnesses | |
| To manage chronic diseases | | |
| Cope with stress and fight illness | | |
| Educating health care professionals. | Promoting a healthy diet through nurses | Role of nurses towards nutrition of the child. |
| Providing nutrition therapy | | |
| Educating families via nurses | | |

Table 4: Subcategories and main category

5.1 Growth and Development

Breast milk plays an important part in the role of nutrition in the growth and development of children. It is also the foundation for physical growth and development. Breast milk helps

to fight children against different bacteria and viruses, which would restrict their overall development. Breast milk provides supporting factors for immunomodulatory and intestinal growth. Breastfed infants are more capable of self-control than formula-fed infants. After 6 months children require more sources of iron even when a child is breastfed. (Salmio, Tuokola, Strengell & Ashorn 2014.) Alongside, impact of breast milk is shown instantly as well as later in child health and overall development (Herman, Baer, Adams, Sabo. Duran, Johnson, Yakes 2013).

A Healthy diet influences the overall success of children. Healthy Nutrition is a key component of growth and development in children, it helps to maintain a good life for recent and future life (Jain 2020). The school performance of a young child has an impact through good nutrition. The learning capacity of children, preparation for school, and as well as in performance later in life are shown from insufficiency in nutrients. For all forms of growth and school success, nutrition plays a significant role for young children as well as adults. The child who receives healthy food within first year faces a healthy life for many years. (Herman et al. 2013.)

In the role of nutrition among children **control of poor nutrition** that leads to general health issues is important. During the crucial two-year period after birth, children with poor diets seemed to be withdrawn, less active, and less helpful than their well-nourished children. A well-dieted child has increased alertness and power to join in educational activities, social interactions, therapies, and advantages from fewer illnesses and improved coping skills. Two-year-old children who have insufficient nutrition are more likely to start school late and 16% more likely to fail than children consuming healthy nutrients. (Jain 2020.)

5.2 Vitamin based treatment of multiple diseases

Development of the brain in children is necessary. The mind of a child grows faster at two to three years stage and they need a high amount of iron. In childhood, iron insufficiency is the most common nutrients issue all over the world because after six months child requires more sources of iron even when the child is breastfed. Insufficiency of iron leads to anemia, serious anemia will affect the performance of psychomotor and cognitive development. Sufficient nutrition is most important for everyone to prevent different kinds of health consequences. (Herman et al. 2013.)

Good mood improvement has a positive influence on the lives of children. It is intended that children have a positive outlook on life through good mood enhancement. Having adequate vitamins helps to keep the mood of children stable and avoids further problems. B12 vitamin is an important cofactor in DNA and RNA synthesis. There are numerous types of

families with different types of diet. Families who eat meat or fish less than once weekly are at a risk for a lack of vitamin B12. Alongside children who are breastfed by vegan mothers experience vitamin B12 deficiency between the ages of two and 12 months. Insufficiency of B12 vitamin results in haematological (megaloblastic anaemia) and neurological disorders (neurodevelopment delay, and regression, neuropsychiatric disorders). (Winckel et al. 2011.)

One of the primary elements of vitamins is **maintaining bone health** in children. The plasma levels of 25-OH-vitamin D in vegetarians were found to be lower than in lacto-vegetarians, both with lower levels than meat and fish eaters. Generally, a well-balanced lacto-ovo-vegetarian diet meets the increasing nutritional needs of children. Adequate intake of calcium during childhood is necessary to obtain normal bone mineral mass for a lifetime (Winckel et al. 2011.) As a matter of fact, in long-term parenteral nutrition children are in risk to bone metabolism, therefore it is important to ensure enough intake of calcium and vitamin D (Salmio et al. 2014).

5.3 Early aware of malnutrition and overweight

Death in children at an early stage needs to be **inhibited**, the death rate can be stopped by early interventions. It has been demonstrated that malnutrition and overweight play a major role in the nutrition of the infant. Overeating or deficiency of food both leads to poor nutrition. It has shown that the huge burden of child death outcomes from malnutrition. Childhood undernutrition, including fetal growth conditions, stunting, wasting, vitamin A and zinc deficiency, and inefficient breastfeeding, has recently been estimated to cause 3.1 million deaths in children. The middle level of acute malnutrition in children is associated with a slightly increased risk of death and on the other hand, serious acute malnutrition is linked with a higher risk of death. (Kelsey, Johnstone, Moses & James 2014.) Correspondingly diarrhea is related to malabsorption and marked protein, vitamin A, zinc, and other micro-nutrient failures.

All infections are caused by dietary protein loss and as well as with the loss of amino acid. Moreover, acute malnutrition in children causes disturbance in innate immune function. For this reason, the child death rate is increased due to lack of proper nutrition and from an infectious disease like bacterial sepsis, diarrhea, and pneumonia. (Kelsey et al. 2014.) For children who visited the hospital due to malnutrition during their first year of life, doctors result that children were continually smaller than those who have not experienced malnutrition later in age three and four years. (Jain 2020.)

Balancing overweight in children is a key factor for a daily healthy life. Overeating and junk foods contribute to overweight problems in young children. Overweight leads to a raise in BMI of children and fat percent. The study of early introduction of complementary foods and childhood overweight in breastfed and formula-fed infants in the Netherlands (the PIAMA birth cohort study) found that children aged two to 12 who received complimentary food before four months were at a greater risk of overweight and obesity. On the other hand, breastfeeding is an important preventative factor for overweight in children between zero to three months. For breastfed infants, long-term diseases such as asthma, type two diabetes, and obesity have been reported to reduce. Breastfeeding has been shown to help in the maintenance in a healthy weight of children. (Pluymen et al. 2018.)

Nurses should **support food allergy and vegan children** since children with food allergy are at risk of developing micronutrient malnutrition for a broad range of micronutrients, including iodine, calcium, and vitamin D. Equally children with an only a vegan diet and not breastfed are at risk of protein deficiencies and malnutrition as well. (Venter, Groetch, Netting & Meyer 2017.) Vegan children are likely to be smaller and thinner (Winckel, Velde, Bruyne & Biervliet 2011). However, feeding problems are recognized as a major problem in food-allergic children which then shows as a result of malabsorption or as the result of a general inflammatory process (Venter et al. 2017). This suggests that the more limited the diet and the younger the child the greater possibility of malfunctions. Children in need of special health care (CSHCN) are at high risk for nutritional shortages, and 40 percent of babies and children in need of special health care are at nutritional risk (Jain 2020).

5.4 Prevention of illnesses

The importance of nutrition plays a vital role in the **avoidance of physical and mental ailments** in children (Pluymen et al. 2018). Mental health, particularly for the growth and development of children is as important as physical health. Breastfeeding is seen to help reduce perinatal anguish such as mental or physical pain in children. (Herman et al. 2013.) Alternatively, psychiatric issues related to autonomy, hyperactivity, unhappiness, bipolar disorder, schizophrenia, and anxiety were reported by the center for development due to diet imbalance (Jain 2020). Healthy food increases somatic and psychological capabilities (Pluymen et al. 2018).

One purpose of role of nutrition is **to manage chronic diseases** through healthy diets. Both overeating and undereating lead to the risk of chronic illness in children. Besides, insufficiency of B12 vitamin results in hematological (megaloblastic anemia) and neurological disorders. However, vegetarian diets lead to lower ischemic cardiovascular mortality and lower obesity incidence. Recent research has shown that while nutrition is not optimal during

crucial periods, a lifetime emphasis on nutrition should be preserved, as the effects of negative exposures can be diverted. (Pluymen et al. 2018.)

Due to undernutrition, an infection may occur through loss of appetite, amino acid, and micronutrients. Lack of proper intake nutrition leads to exposure to infection which leads to difficulty in chronic gut inflammation and has change in the gut microbiota. (Kelsey et al. 2014.) Breastfeeding can minimize the harmful effects of gestational diabetes on infant growth and reduces the risk of excessing chronic diseases in infants (Herman et al 2013). Providing complementary food earlier than four months could lead to a higher risk of heart diseases and type two diabetes (Pluymen et al. 2018).

Nutrition can **cope with stress and fight illness** in various ways such as a ketogenic diet which is high in carbohydrates, protein, and fat. This diet is used for many types of epilepsy care. In this case, the brain uses ketones as its energy source, instead of glucose. The ketogenic diet should not be stopped abruptly for example, in emergencies as it may provoke seizures. (Salmio et al. 2014.)

5.5 Promoting a healthy diet through nurses

Educating health care professionals is important particularly for up-to-date knowledge and skills. Nurses have an important role in monitoring the growth of children especially height and weight and in providing the guidelines to the parents about feeding. (Venter et al. 2017.) **Nutritional therapy** is an important aspect of the diagnosis of chronic serious childhood diseases. The goal of nutrition therapy is to ensure normal development of children. Nutrition therapy is ideally done by a multidisciplinary team such as a nutritionist, pediatrician, and pediatric nurse. However, the planning of nutrition care for a seriously ill child and the responsibility for its implementation belong to special medical care. (Salmio et al. 2014).

Vegan children are likely to be smaller and thinner, it is essential as a nurse to be aware and to discuss why a vegetarian diet is adopted. Due to their small body reserve at birth, children who are breastfed by vegan mothers will experience vitamin B12 deficiency between the ages of two and 12 months, even without signs of malnutrition from a mother. Nurses must pay special attention to B12 vitamins with vegetarian diet children. (Winckel et al. 2011.)

For children with numerous food allergies, nurses have an important role in **educating the parents** as well as advising on food expulsion and replacement. Nutrition inadequacy and the risk of growth are high which is why monitoring the growth especially growth in height/length and guiding the parents on normal feeding to prevent feeding difficulties is

important. Due to the different kinds of food allergy in children, parents are supported by nurses about food diet and food replacement. Nutrition inadequacy and the risk of growth are high which is why nurses monitoring the growth especially growth in height/length and guiding the parents on normal feeding to prevent feeding difficulties is important. (Venter et al. 2017.)

All nurses outlined that overweight was a sensitive topic. Many nurses felt uncomfortable to bring up the issues about overweight with their parents. They recognized that it was slightly due to fear of offending parents. Reactions of parents from the weight-related conversations altered between parents. Some parents responded positively and expressed motivation to change their lifestyle. Certain parents responded strongly to the news and parents could get angry, mad, and felt accused. Some nurses felt it would be beneficial to give information about the discussion topic beforehand due to the sensitive topic. The nurses speculated that if the parents were given information beforehand, they would less likely become upset. (Sjunnestrand, Nordin, Eli, Nowicka & Ek 2019.)

6 DISCUSSION

6.1 Discussion of key findings

The purpose of this literature review was to contribute knowledge for families and pediatric nurses about the role of nutrition. Another purpose is to prevent malnutrition and support caregivers in child development. The aim of the thesis is to discover the role of nutrition among young children from a nursing perspective. In this thesis, the role of nutrition among children six years of age and younger and the role of nurses towards their nutrition is answered.

This thesis question is well answered by the growth and development theme. The results indicate that one of the key factors in the growth and development of children is breast milk since it provides many supporting factors for the growth (Salmio, Tuokkola, Strengell & Ashorn 2014). It is important to take into consideration as parents. Many new parents may know little about caring for a baby and may not know anything about the various benefits of breast milk.

Based on the findings of similar studies nutrition is a vital component of growth and development which helps to sustain healthy lives for many years for young children. Another key thing was found that the role of nutrition influences on young child's overall performance. (Jain 2020.) These findings assist parents and nurses in daycare and child health care centers while making choices regarding nutrition for children. In all aspects of life, people often do not know how much nutrition influences their overall efficiency. While nutrition affects an adult's behavior, children are in a stage of growth, which is why paying special attention to them is even more important.

The results highlighted the importance of iron, calcium, and as well as the importance of B12 and D-vitamin in children. In the role of nutrition in children, vitamins play an important part. Insufficiency in necessary vitamins has a negative impact on children's overall health such as insufficiency in iron leads to anaemia. (Herman & et. all 2013.) Since vitamins are profoundly linked to the development of the brain in children caregivers should especially take note of this. Lack of minerals also has a negative impact on the overall health of children.

The outcome of vitamin B12 shows that insufficiency contributes to neurological and hematological problems (Winckel & et. all 2011). While exploring these results children breastfed by vegan mothers experience B12 deficiencies mostly. The study demonstrates a connection between the role of nutrition of vegan mothers and their eating choices affecting their

children's nutrition health. Children are unable to make their own choices, which is why the position of parents is most critical.

Results show that due to malnutrition there is a greater risk of an increase in disease as well as it leads to deaths (Kelsey, Johnstone, Moses & James 2014). It affects the growth and development of children who have experienced malnutrition during childhood. It has demonstrated that those children who need special health care are in a nutritional risk group. A child who got early complementary foods before four months, they faced overweight at the age of two to 12 and due to this rise in BMI and fat percent in children. (Pluymen et al. 2018.) Therefore, when nutrition is in balance there are no signs of malnutrition, overweight, and child mortality.

Results and previous studies show a similar type of information for example unhealthy nutrient impact malnutrition in early childhood. Due to under nutrient, nearly half of deaths occur under the age of five (Gandhi, Gulabani, Joshi, Pathak, Sharma & Yadav 2017, 42). Decreasing death in children and preventing them from malnutrition is an important role in nutrition. Inadequacy micronutrient has a great negative impact on child entire lives and their complete physical and rational potential.

Both result and previous studies reflect that overweight and obesity both leads to complexity in later infancy as well as in later life. It leads to a risk of type two diabetes as well as other chronic diseases. Studies show that the rate of overweight under five overweight will grow from 40 million children to 43 million by 2025. (Terveyskylä 2020.) The rate is growing which is why early recognition of overweight by nurses and parents is critical. The factor of obesity is genetic and growth environment, lack of exercise, and easily accessible high-energy foods predispose to the development of overweight. In addition to weight loss, increases physical activity and healthy nutritional changes decreases health problems, and helps to maintain normal adult weight (Terveyskylä 2020). Therefore, a healthy diet and a healthy lifestyle are an important factor to decrease overweight and chronic diseases.

The result indicates that nutrition has an important role in the prevention of the physical and mental problems in children for example vegetarian diets help to lower ischemic cardiovascular mortality and lower obesity incidence (Pluymen et al. 2018). Nutrition helps to prevent infection, as well as helps to recovery (Kelsey et al.2014). Therefore, nutrition therapy is one of the most important part of the prevention of different diseases as well as it helps to recover from diseases in time. Breastfeeding can reduce the harmful effects of gestational diabetes on infant growth and it helps to maintain a healthy weight as well as prevents from chronic diseases (Herman et al. 2013). Breastfeeding helps to minimize perinatal anguish such as mental or physical pain in children (Herman et al. 2013). Finally, continuous

breastfeeding leads to, decrease in the different kinds of pain, protect the child from various short term and long-term diseases as well as it makes strong immunity power of child.

The result supports also previous studies that nutrition for example fiber helps to prevent heart diseases, diabetes, and constipation. Appropriate nutrition prevents different kinds of long term and short-term diseases, helps in recovery of disease as well as to continue healthy life ahead.

One of the major influencers is a nurse in the role of nutrition among children such as in child health care centers, daycare, and as well as in hospitals. This is supported by the results that nurses play an important role in monitoring the growth of the infant, especially height and weight, and in providing parents with guidance on feeding. The data grants a clearer understanding of the dietary needs of children with special diets such as vegan and children with food allergies. It has shown that nurses play an important role in educating the parents as well as advising on food expulsion and replacement. Guiding the parents on normal feeding to prevent feeding difficulties is important. (Venter et al. 2017.) Role of nursing is important for treating different diseases and in nutritional guidance. They support families in maintaining dinner schedule and balancing healthy lifestyles in daily basis.

6.2 Ethical and trustworthiness of the study

Ethics is necessary for the security of society, for good research practice, nursing education, and as well for the improvement of evidence. Researchers need to prepare carefully how to approach ethics in their research and develop an understanding and education of ethics before participating in the research process. Beneficence, integrity, truthfulness, and loyalty play an important role in the ethics of the research process. (Doody & Noonan, 2016,1.)

By beneficence, the study is intended to do good and benefit the participants/ organization. Parents, pediatric nurses, and pediatric ward benefit from research. Alongside researchers are committed in treating participants justly and rightfully in the process of the research study according to the concept of integrity. As well as by truthfulness and loyalty it is meant that researcher has an obligation, to tell the truth about the study. The researcher must make sure that the research project is explained well to participants and that they have understood all forms of the study. (Doody & Noonan, 2016,1.) When there is trust between the participants and the researcher, loyalty is created. Researchers should maintain privacy. (Doody& Noonan, 2016,3.) To conclude the ethical perspective the laws and regulations of human action are involved with ethical issues. The researcher is in charge of protecting the participant's rights in all phases of the study. (Holloway & Wheeler, 2010.)

The research identified as of no use is said to absent accuracy which means conclusions are not valued perceiving because they are untrustworthy. Therefore, trustworthiness is also necessary for the research process. Credibility, transferability, dependability, and confirmability activities play an important role in the implementation of trustworthiness in the research process. (Amankwaa 2016, 1.)

There are different approaches to implementing qualitative research according to Lincoln and Guba's (1985) description. Continuous commitment, constant observation, peer debriefing, enough references, and member checking. Generally, member checking is often used as an approach for verifying the validity of an account and it is the most essential technique for creating credibility. (Amankwaa 2016, 2.)

This thesis was consistently committed and observed. Peer debriefing and exploring new development strategies also took place. Enough and trustworthy references are placed. The online meeting was arranged and discussed, and topics were divided before starting to write the thesis. Sometimes the same and different topics were read and discussed later together before making conclusions. It was good to do a thesis in pairs since ideas could be shared even though sometimes it was difficult to arrange a suitable time for both. Supervisor teacher assisted in improving the thesis process. Thesis was peer reviewed and second reviewer had also taken place.

One of the tools for introducing transferability is a thick description which Lincoln and Guba express as a way of obtaining a form of external validity. By identifying an issue in precise detail, it is easy to distinguish the matter which the conclusions are drawn can be applied to other environments, periods, circumstances, and individuals. However, according to Merriam (1995) while deciding whether and how research findings may be transferred to other settings it is the responsibility of the research user. Accurate and enough information must be provided by the original researcher on the study dimension to support the user for decision making. (Amankwaa 2016, 2.)

A method as inquiry audit is suggested by Lincoln and Guba (1985) to create dependability. Inquiry audits are regulated by acquiring a researcher who is not involved. The research process evaluates both the method and the research product. The aim to assess the accuracy of whether the observations, understanding and, conclusions are supported or not (Lincoln & Guba 1985).

According to Lincoln & Guba (1985) audit trail, triangulation and reflexivity play a key role in confirmability. It is said that audit trail is a clear definition of the research steps taken from the start of a research project to the improvement and in informing of results. Researchers see triangulation as a technique for evaluating findings and as a test of validity using various

data sources in a study to improve their understanding. Lastly to develop reflexivity following steps have been recommended. Planning research that contains several researchers which helps in development and understanding of a study better by analysing it together. Having a reflexive journal where including daily notes during research process is also seen as valuable. (Lincoln & Guba, 1985.) Concluding this trustworthiness is a key element within the research process. Adding important research activities mentioned above helps to bring quality research from which many can benefit.

7 CONCLUSION AND NEED FOR FURTHER RESEARCH

In conclusion, the results indicate that there are many nutritional roles among children six years of age and younger and as well as the role of nurse in children's nutrition is a crucial aspect.

Based on the results the major nutritional roles in children are growth and development, multiple disease prevention, early awareness of malnutrition, and overweight. Alongside offering dietary counselling through nurses by educating health care professionals, families and providing nutrition therapy are key nursing roles in nutritional wellbeing of children.

Breast milk plays a significant role in nutrition for young children. Good nutrition is a crucial factor in the growth and development of children. During the two years after birth special attention to good nutrition must be paid. Brain development in children is important. Having enough vitamins such as vitamin D, B12, and calcium helps to keep children's mood healthy and prevents further health problems. Overweight and undernutrition issues can be reduced through early interventions by being conscious of malnutrition and overweight at an early stage. One of the roles of nutrition is to regulate chronic diseases through a balanced diet. As a nurse, it is important to be aware of families adopting a vegetarian diet and children with food allergies and support them in food choices.

Consideration future research it is recommended to have more evidence-based nutrition knowledge provided to the families of children. For this to take place, nurses should be trained in evidence-based nursing as well as developing communication skills. As there are different types of families with different cultures which means different nutrition types. It is also suggested that broader study data should be carried out and the background and multiculturalism of families should be contemplated. As a nurse it is also important to consider special diet of children.

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APPENDICES

Appendix 1. The summary of articles

Article 1

Reference: Ashorn, M., Merras-Salmio, L., Strengell, K. & Tuokkola, J. 2014.

Lääketieteellinen Aikakauskirja Duodecim. Sairaalan Lapsen Ravitseminen

The main findings:

- Ketogenic diet, rich in carbohydrates, protein and fat, is used for many forms of epilepsy treatment.
- The brain uses ketones as its energy source.
- Seizure might occur if ketogenic diet is stopped abruptly.
- Breast milk provides supporting factors for the immunomodulatory and intestinal growth.
- In long-term parenteral nutrition children are in risk to bone metabolism therefore it is important to ensure enough intake of calcium and vitamin D.
- Nutritional therapy is an important aspect of the diagnosis of chronic serious childhood diseases.
- Nutrition therapy is ideally done by a multidisciplinary team such as nutritionist, pediatrician and pediatric nurse.

Article 2

Reference: Ek, A., Eli, K., Nordin, K., Nowicka, P. & Sjunnestrand, M. 2019. Planting a Seed - Child Health Care Nurses' Perceptions of Speaking to Parents About Overweight and Obesity: A Qualitative Study Within the STOP Project. BMC Public Health

The main findings:

- Many nurses felt uncomfortable to bring up the issues of overweight with the parents due to fear of offending them.

- Reactions of parents from the weight-related conversations changed between parents, some parents responded positively and expressed motivation to change their lifestyle.
- Certain parents responded strongly to the news of overweight and parents could get angry, mad and felt accused

Article 3

Reference: Herman, D., Baer, M., Adams, E., Sabo, L., Duran, N., Johnson, D., Yakes, E. 2013. Life course perspective: Evidence for role of nutrition.

The main findings:

- Breast milk's impact is shown instantly as well as later in child health and development.
- Breastfeeding helps to reduce perinatal death rate in children.
- Breastfeeding helps to reduce perinatal anguish such as mental or physical pain in children.
- For breastfed infants, long-term diseases such as asthma, type 2 diabetes and obesity have been reported to reduce.
- Breastfeeding is important preventative factor for overweight in children between 0-3 months.
- Overweight leads to raise in children's BMI and fat percent.
- Insufficiency in nutrients affect children's learning capacity, in preparation for the school and has impact in performance later in life.
- Children's mind grows rapidly especially at 2-3 years stage, therefore they require high amount of iron.
- After 6 months child require more sources of iron even the child is breastfed
- Lack of iron leads to anemia.
- Serious anemia affects the performance of psychomotor and cognitive development.
- Both overeating and undereating leads to risk of chronic illness in children.

- Breastfeeding can minimize the harmful effects of gestational diabetes on infant growth.

Article 4

Reference: Jain, G. 2020. Diet and Nutrition, The Role of Nutrition and Wellness in Healthy Schools

The main findings:

- Nutrition is key component in growth and development of children.
- Healthy food increases somatic and psychological capabilities.
- Child who receives healthy food within 1st year will face healthy life many years.
- Overeating or deficiency of food both leads to poor nutrition.
- Nutrition will help to maintain good life for recent and future.
- Children who visited hospital due to malnutrition during their first year of life, doctors result that children were continually smaller than those who were not experienced malnutrition later in age three and four years.
- Poor nutrition/overeating leads to weight issues.
- 40% of infants and children are under nutritional risk with need of special health care.
- Good or poor nutrition impacts on young child's school performance.
- Two-year-old children who have insufficient nutrition are more likely to start school late and 16% more likely to fail than children with healthy nutrients.
- Lack of different kinds of vegetables, fruits, dairy foods are linked with lower performance in pupils.
- Psychiatric issues related to autonomy, hyperactivity, unhappiness, bipolar disorder, schizophrenia and anxiety were reported by the center for development due to diet imbalance.
- The lack of nutrients such as vitamins B12, B6, A, C, folic acid, zinc, iron, and calcium are linked with low capacity in study, increased absent and tiredness in children.
- During the crucial two-year period after birth, children with poor diets seemed to be withdrawn, less active, and less helpful than their well-nourished children.

- For all forms of growth and school success, nutrition plays a significant role for young children as well as adults.

Article 5

Reference: Kelsey, J., Johnstone, T., Moses, N., & James, B. .2014. Childhood Malnutrition: Toward an Understanding of Infections, Inflammation, and Antimicrobials.

The main findings:

- Childhood undernutrition, including fetal growth condition, stunting, wasting, vitamin A and zinc deficiency, and inefficient breastfeeding has recently been estimated to cause 3.1 million deaths in children.
- Child death rate is increased due to lack of proper nutrition and from infectious disease like bacterial sepsis, diarrhoea and pneumonia.
- Due to undernutrition, infection may occur through loss of appetite, amino acid and micronutrient.
- Diarrhoea causes to lose nutrients like vitamin A, zinc, and proteins.
- Lack of proper intake nutrition leads to exposure to infection which leads to difficulty in chronic gut inflammation and has changes in the gut microbiota.
- Huge burden of child death result from malnutrition or undernutrition and it influences infectious diseases.
- Acute malnutrition in children causes disturbance in innate immune function.
- Middle level of acute malnutrition in children is linked with slightly increased risk of death.
- Serious acute malnutrition in children are linked with higher risk of death.

Article 6

Reference: Pluymen, L., Wiga, A., Gehring, U., Koppelman, G., Smit, H., Rossem, L. 2018. Early Introduction of Complementary Foods and Childhood Overweight in Breast-fed and Formula-fed Infants in the Netherlands: the PIAMA birth cohort study.

The main findings:

- Children aged 2-12 who received complementary food before 4 months were in a greater risk of overweight and obesity.
- Breastfed infants are more capable to self-control than formula fed infants.
- Providing complementary food earlier than 4 months may lead to worry of obesity in adulthood and can have higher risk of heart diseases and type 2 diabetes.

Article 7

Reference: Venter, C., Groetch, M., Netting, M & Meyer, R. 2017. A Patient-Specific Approach to Develop an Exclusion Diet to Manage Food Allergy in Infants and Children. Children's Hospital Colorado, University of Colorado, Aurora, CO, USA

The main findings:

- Cashew nuts and peanut were more inclined to cause anaphylaxis than hazelnuts.
- Food allergic children are at risk of developing micronutrient malnutrition for a broad range of micronutrients, including iodine, calcium, and vitamin D.
- Feeding problems are recognized as a major problem in food allergic children which then shows as a result of malabsorption or as the result of general inflammatory process.
- Due to different kind of food allergy in children, parents are supported by nurse about food dietary and food replacement.
- Nurses have important role in monitoring the Childs growth specially height and providing the guideline to the parents about feeding and advising in food expulsion and replacement.

Article 8

Reference: Winckel, M., Velde, S., Bruyne, R. & Biervliet, S. 2011. Clinical Practice: Vegetarian Infant and Child Nutrition. Department of Paediatrics, Division of Paediatric Gastroenterology and Nutrition, University Hospital Ghent, Belgium

The main findings:

- Vegetarian diets lead to lower ischaemic cardiovascular mortality and lower obesity incidence.
- The more limited the diet and the younger the child the greater possibility of malfunctions.
- Vegan children are likely to be smaller and thinner.
- Children who are breastfed by vegan mothers will experience vitamin B12 deficiency between the ages of 2 and 12 months.
- Children with only vegan diet and not breastfed are risk of protein deficiencies and malnutrition as well.
- Nurses must pay special attention to B12 vitamins with vegetarian diet children.
- B12 vitamin is an important cofactor in DNA and RNA synthesis.
- B12 deficiency rises malabsorption symptoms in organs with rapid cell turnover such as bone marrow and intestine.
- Insufficiency of B12 vitamin results in haematological (megaloblastic anaemia) and neurological disorders.
- Families who eat meat or fish less than once weekly are at a risk for a lack of vitamin B12.
- Adequate intake of calcium during childhood is necessary to obtain normal bone mineral mass for a lifetime.
- The plasma levels of 25-OH-vitamin D in vegetarians were found to be lower than in lacto-vegetarians, both with lower levels than meat and fish eaters.