

Post Diploma Graduate (PDG) Course in Human Nutrition and Dietetics in NAIROBI-KENYA School of online and distance learning

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1. Define **critical period** of growth and development, give an example of why this is important to the development of the fetus.

The 1,000 days between pregnancy and a child’s 2nd birthday are the most critical time for child’s cognitive and physical growth and development. The health and well-being of a pregnant woman is directly connected to the growth and health of her fetus. The right nutrition for the mother and for the child during this time can have a profound impact on the child’s growth and development and reduce disease risk, as well as protect the mother’s health.

The critical period is important because if something interferes with growth and development during this period, the effects are irreversible. Each organ and tissue in the developing fetus is vulnerable to nutrient deficiency and to toxins, which can interfere with their growth and development. For example, the heart is fully developed by 16 weeks but lungs by 26 weeks. Therefore early malnutrition of the pregnant could severely affect the heart; where as later malnutrition could damage the lungs. Continuous good care is therefore vital for a pregnant woman.

1. What is meant by growth and development and what are the factors affecting normal growth and development of infants and toddlers?

Growth is the increase in weight and height with age, or size that comes about because of the multiplication of cells and their differentiation for many different functions in the body while development refers to increase in skills and functions. Growth is a continuous but not a uniform process from conception to full maturity.

Infants are children from birth to one year (12 months) while toddlers are children from one year (12 months) to three years (36 months).

Factors affecting normal growth and development of infants and toddlers include the following;

1. Heredity

Heredity is the transmission of physical characteristics from parents to children through their genes. It influences all aspects of physical appearance such as height, weight, body structure, the colour of the eye, the texture of the hair, and even intelligence and aptitudes. Diseases and conditions such as heart disease, diabetes, obesity, etc., can also be passed through genes, thereby affecting the growth and development of the child adversely.

1. Environment

The environment plays a critical role in the development of children and it represents the sum total of physical and psychological stimulation the child receives. Some of the environmental factors influencing early childhood development involve the physical surroundings and geographical conditions of the place the child lives in, as well his social environment and relationships with family and peers. It is easy to understand that a well-nurtured child does better than a deprived one; the environment children are constantly immersed in contributes to this. A good school and a loving family builds in children strong social and interpersonal skills, which will enable them to excel in other areas such as academics and extracurricular activities. This will, of course, be different for children who are raised in stressful environments.

1. Sex:

The sex of the child is another major factor affecting the physical growth and development of a child. Boys and girls grow in different ways, especially nearing puberty. Boys tend to be taller and physically stronger than girls. However, girls tend to mature faster during adolescence, while boys mature over a longer period of time. The physical structure of their bodies also has differences which make boys more athletic and suited for activities that require physical rigour. Their temperaments also vary, making them show interest in different things.

1. Exercise:

Exercise here refers to the normal play time and sports activities which help the body gain an increase in muscular strength and put on bone mass. Proper exercise helps children grow well and reach milestones on time or sooner. Exercise also keeps them healthy and fights off diseases by strengthening the immune system, especially if they play outside. This is because outdoor play exposes them to microbes that help them build resistance and prevent allergies.

1. Hormones

The timely functioning of hormones is critical for normal physical growth and development in children. Imbalances in the functioning of hormone-secreting glands can result in growth defects, obesity, behavioural problems and other diseases. During puberty, the gonads produce sex hormones which control the development of the sex organs and the appearance of secondary sexual characteristics in boys and girls.

1. Nutrition

Nutrition is a critical factor in growth as everything the body needs to build and repair itself comes from the food we eat. Undernutrition can cause deficiency diseases that adversely affect the growth and development of children. On the other hand, overeating or over nutrition can lead to obesity and health problems in the long run, such as diabetes and heart disease. A balanced diet that is rich in vitamins, minerals, proteins, carbohydrates and fats is essential for the development of the brain and body.

1. Familial Influence

Families have the most profound impact in nurturing a child and determining the ways in which they develop psychologically and socially. Whether they are raised by their parents, grandparents or foster care, they need basic love, care and courtesy to develop as healthy functional individuals. The most positive growth is seen when families invest time, energy and love in the development of the child through activities, such as reading to them, playing with them and having deep meaningful conversations. Families that abuse or neglect children would affect their positive development. These children may end up as individuals who have poor social skills and difficulty bonding with other people as adults. Helicopter parenting also has negative effects as they render children dependent on the parents even as young adults and unable to deal with difficulties in life on their own

1. Geographical Influences

Where you live also has a great influence on how your children turn out to be. The schools they attend, the neighbourhood they live in, the opportunities offered by the community and their peer circles are some of the social factors affecting a child’s development. Living in an enriching community that has parks, libraries and community centres for group activities and sports all play a role in developing the child’s skills, talents, and behaviour. Uninteresting communities can push some children to not go outside often but play video games at home instead. Even the weather of a place influences children in the form of bodily rhythms, allergies and other health conditions.

1. Socio-Economic Status

The socio-economic status of a family determines the quality of the opportunity a child gets. Studying in better schools that are more expensive definitely has benefits in the long run. Well-off families can also offer better learning resources for their children and they afford special aid if the kids need it. Children from poorer families may not have access to educational resources and good nutrition to reach their full potential. They may also have working parents who work too many hours and cannot invest enough quality time in their development.

1. Learning and Reinforcement

Learning involves much more than schooling. It is also concerned with building the child up mentally, intellectually, emotionally, and socially so they operate as healthy functional individuals in the society. This is where the development of the mind takes place and the child can gain some maturity. Reinforcement is a component of learning where an activity or exercise is repeated and refined to solidify the lessons learned. An example is playing a musical instrument; they get better at playing it as they practice playing the instrument. Therefore, any lesson that is taught has to be repeated until the right results are obtained.

1. What are the three classifications of under nutrition in preschool children and how is this determined?

Pre school children are children whose age range from one to four years. Undernutrition is one of the health problems affecting these age category of children. Under nutrition in this age category is classified in to three types. The following are the three classifications and criteria used for their determination:

**stunting**: Is assessed by the anthropometrics measures of height for age. It is an indicator for linear growth which is associated with long term deficiency hence chronic malnutrition. This is caused by cumulative effects of inadequate nutrition (poor diet) and/or health(disease). Stunting is defined as low height for age at <-2 standard deviations of median value for the National Center for Health Statistic (NCHS) and World Health Organization (WHO) international growth reference. Severe stunting is <-3 SD

**Underweight:** Is assessed by anthropometrics measures of weight for age. This represents body mass relative to age. Weight for age is influenced by height for weight. These two together cause both stunting and wasting. Both indicate long-term nutrition and health experience of an individual or population. Underweight is defined as low weight for age at < 2SD of median NCHS/WHO.

**Wasting:** Represents recent and severe process characterized by high weight losses, mostly due to acute shortages of food and/or severe disease. Chronic dietary deficiency and disease result in wasting. Anthropometrics index for wasting is weight for height. Wasting is low weight for height <-2SD NCHC/WHO and severe wasting is <-3SD. The prevalence is usually limited to 2-3% beyond which it becomes an emergency.

1. What precautions should one take when preparing infant formula?

Infant formula are made to imitate mother’s milk. Cow’s milk is the preferred breast milk substitute for most mothers because it is easily available at an affordable price. However, problems associated with formula and cows milk range from diarrhea, vomiting and dehydration, which in turn lead to failure to absorb nutrients.

Formula can be used as a substitute for breastfeeding when it is absolutely necessary. Exclusive breastfeeding should be encouraged because of its various advantages. The health provider will ensure that the option is “acceptable, feasible, affordable, sustainable, and safe” (AFASS).

The following are the precautions one should take when preparing for an infant formula.

* Use a concentrated infant formula containing vitamins and irons.
* Use cup and spoon that have been washed in clean water and dishwashing soap/detergent.
* Place them in boiling water for 3 minutes to ensure sterility.
* Squeeze water through the nipple holes to be sure they are open. Rinse them well so that
* soap is gone and let them stand in a rack to dry.
* Clean the top of the formula can with soap and water and rinse.
* Open the formula can with a clean opener and pour out the necessary amount. Cover the
* can with fresh foil or plastic wrap and put it in the refrigerator/cool place.
* Follow instructions for the correct preparation of the formula and make just enough for one feed.
* Make fresh formula each time to avoid contamination

1. What are the key causes/determinants of malnutrition in children?

The key causes/determination of malnutrition in children include the following;

* Poor Hygiene- overcrowding and poor sanitation.
* Poor water supply resulting in children being dirty and developing various skin problems and diarrhea.
* Absence of latrines leads to easy spread of intestinal worms.
* Poor disposal of rubbish leading to increased fly and gnat breeding and a likelihood of a spread of diarrhea disease and other infections.
* Poverty: If a family has little land for cultivation and is poor, parents will be unable to buy sufficient food for their families.
* Illiteracy/Education level - Parents limited knowledge of their children’s needs is likely to result in poor health and malnutrition.
* Insufficient health facilities and services.
* Inherited diseases e.g. sickle cell anemia, congenital heart diseases etc.
* HIV/AIDS and opportunistic infections.
* Food insecurity which could be made worse by harsh climatic conditions such as floods/rains and drought which destroy crops and livestock.

1. What are some of the risks associated with introducing complementary foods too early?

Complementary feeding - The use of age-appropriate, adequate and safe solid or semi-solid food in addition to breast milk or a breast milk substitute. The process starts when breast milk or infant formula alone is no longer sufficient to meet the nutritional requirements of an infant (South Sudan MIYCN guidelines, 2017). It is not recommended to provide any solid, semi-solid or soft foods to children less than 6 months of age. The target range for complementary feeding is generally considered to be 6–23 months.

Introducing complementary foods too early is associated with the following risks;

1. It decreases the intensity and frequency of suckling and as a consequence, breast milk production is reduced.
2. Too early introduction of cereals can interfere with the absorption of breast milk iron, which is normally low in concentration.
3. It would lead diarrhea because in developing countries population have restricted diets and live in unsanitary environments.
4. Would lead to entry of pathogenic microorganisms to the child’s tract during feeding.
5. Other long term risks such as obesity, hypertension, arteriosclerosis and food allergy may result if the child is weaned too early.

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