LIFE CYCLE APPROACH TO CHILD AND ADOLESCENT HEALTH

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SUMMARY

Young people are our human capital for the future, therefore child and adolescent health has attracted considerable political and professional attention in recent years. Health is indivisible, requirs holistic approach throughout the individual's life. Healthy outcome at one point in the life cycle, provides a positive determinant for health elsewhere in the cycle. Health and development of the 0–19 age group links intimately, at both ends of the range, with reproductive health. Health during childhood is in part determined by the health of the mother, and affected also by factors such as the nutrition of adolescent girls and the avoidance of early pregnancy. These factors, in turn, are influenced by healthy growth and development in childhood.

The paper presents main environmental and socio-cultural challenges for each of the stages of child and adolescent life. Main challenge described are: unsafe abortion, malnutrition, anaemia, malformations, and infections during pregnancy; low birth weight, asphyxia, hypothermia, infection, failure to initiate early and full breastfeeding in the neonatal period; poor nutrition, growth and development, frequent illnesses, injury, abuse and neglect in the early childhood; poor nutrition, growth and development, injury, abuse, neglect, and helminth infections in the early school age; poor nutrition, poor development, chronic conditions, mental disorders, injury, drug abuse, and violence in the adolescence.

Both, prevention of ill health and care for illnesses are important at all times but the balance between them shifts over time during the childhood and adolescence. Main actions needed to meet the child and adolescent needs are presented as well.

Key words: child health, adolescent heath, life cycle, environmental risk, child development"

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Child and adolescent health has attracted considerable political and professional attention in recent years (Table 1). Health is indivisible, requiring holistic approach throughout the individual's life. What happens in pregnancy and the very early stages of childhood will have a profound impact on child and adolescent development. Growth and development of young children enhances the possibilities for their development during the school age period and in adolescence. This will be carried through into the adulthood and old age. Health and development of the children and adolescents links intimately, at both ends of the range, with reproductive health. Health during the childhood is in part determined by the health of the mother, successively affected by factors such as the nutrition of adolescent girls and the avoidance of early pregnancy. Thus, a healthy outcome at one point in the cycle provides a positive determinant for health elsewhere in the cycle. An investment early on will result in a lifetime of economic, social and personal benefits. Both, prevention of ill health and care for illnesses are important at all times but the balance between them shifts over the time during the childhood and adolescence in relation to risks encountered during the particular life-stage (Table 2).

There are a number of external factors influencing outcomes of the mother and child health cycle. Our health is determined to a very considerable extent by the physical environment in which we live. In particular, the younger generation pays a heavy price for the environmental neglect. The air we breathe, the water we drink, the food we eat and the built environment all exact their toll. These issues are addressed by a number of international events (Table 1).

A balanced diet that provides optimum nutrition, together with a clean water supply, are crucial to every stage of development from pre-conception through to later life. Poor nutrition is associated with a reduced resistance to disease, impaired physical and psychological development, and infant morbidity and mortality. An inadequate diet can lead to deficiency disorders and/or to contribute to civilization diseases. In recognition of the food's essential role in promoting and protecting health the European states endorsed the First Action Plan for Food and Nutrition Policy (1).

The social circumstances in which children and adolescents grow to maturity are also of paramount importance. Peer pressure, family values, mass communication, the school environment, and

List of acronyms:
CEHAP – Children's Environment and Health Action Plan for Europe, IMCI – Integrated Management of Childhood Illness, UNICEF – United Nations Children's Fund, WHO – World Health Organization.

Table 1. *Overview of important events addressing child and adolescent health (9)*

- 1991: World Summit for Children: leaders from across the globe issued an urgent appeal to give every child a better future.
- 1999: WHO Regional Office for Europe published HEALTH21: health for all in the 21st century, which laid out a vision to improve the health of the 870 million people living the European Region.
- 1999: The Third Ministerial Conference on Environment and Health placed children's health at the top of the political agenda.
- 2000: The United Nations Millennium Summit of world leaders highlighted development as being at the heart of the global agenda and formulated eight Millennium Development Goals.
- 2002: Global Consultation on Child and Adolescent Health and Development in Stockholm confirmed the need for more investment in those interventions known to have the greatest impact.
- 2002: The Johannesburg Declaration on Sustainable Development underlined the need to eradicate poverty and engage in sustainable development in the context of the need to create a better future for all children.
- 2003: The Children's Environment and Health Action Plan for Europe (CEHAPE) set out steps for various sectors that are designed to decrease exposure to a number of environmental hazards.
- 2003: World Health Assembly adopted Strategic Directions for Improving the Health and Development of Children and Adolescents.
- 2003: WHO Regional Committee for Europe in Vienna supported resolution calling for the development of the comprehensive regional strategy on the health of children and adolescents.
- 2004: Fourth Ministerial Conference on Environment and Health: "The future for our children" accepts the CEHAP as the key platform.

Table 2. *Main risks of pregnancy, childhood and adolescence*

Pregnancy	Neonatal period	Early childhood	Early school age	Adolescence
Unsafe abortion	Low birth weight	Poor nutrition, growth and development	Poor nutrition, growth and development	Poor nutrition
Malnutrition	Asphyxia			Poor development
Anaemia	Hypothermia	Frequent illnesses	Injury	Chronic conditions
Malformations	Infection	Injury	Abuse and neglect	Mental disorders
Infections	Failure to initiate early and full breastfeeding	Abuse and neglect	Helminth infections	Injury, drug abuse, violence

social and gender norms all exert a considerable influence on lifestyle. Over the past decade, many countries in the European region have experienced rapid socio-political change, economic hardship, increased insecurity, conflict and even war. The health-related behaviour of adolescents is a function of all these pressures. Differences in the health experience of boys and girls are apparent in all countries. Some of these are associated with the lower socio-economic status of women; some are related to differences in biology. Social behaviours and gender norms are also important influences.

Poverty is a major determinant of health. Inequities related to economic situation affect both physical and mental health. Poor children grow up in less healthy environments and are more likely to suffer the effects of pollution. Overcrowded housing is invariably associated with a lack of safe areas for play. Accidents and crime are more prevalent; a poor diet and lack of physical activity are more likely. Poverty places maternal and newborn health at risk and has a deleterious impact on mental health. Relative poverty within countries may be even more important than absolute poverty. Relative poverty is growing at a more rapid rate in Europe and central Asia than anywhere in the world. According to the European Anti-Poverty Network, in some European countries as many as 26% of children live in relative poverty (2).

PREGNANCY

The starting point in the life-course of health and development is that every baby should be a wanted baby. Unwanted pregnancies may lead to unsafe abortions, child neglect, malnutrition, disease, and social problems. This implies effective contraceptive advice and availability as young people approach puberty and during their reproductive years.

A healthy start to life is essential. A woman's health directly influences the health and development of her child. Access to timely and responsive health services, including skilled birth attendants at the time of delivery, is essential.

Maternal mortality varies enormously across the European region, ranging from 6 per 100,000 live births in Switzerland to 41 per 100,000 in some Eastern European countries (3).

Inadequate nutrition in the very early stages of development can have an impact throughout an individual's life. In many European countries, micronutrient deficiency diseases co-exist with disorders of energy excess that result from a lack of fruit and vegetable intake. Malnutrition and anaemia, in pregnant women in low-income countries are a significant threat, as they can severely impact a foetus' growth and development and result in long-term consequences. It has been estimated that eliminating malnutrition

among pregnant women would reduce disabilities among their infants by almost one third (4).

Mothers can also be the vectors for transmitting communicable diseases to their babies. Although the absolute numbers remain relatively small, mother-to-child transmission of HIV has increased dramatically in Eastern Europe. In the Ukraine, for example, infection rates in pregnant women rose from 0.005 per 10,000 in 1996 to 17 per 10,000 only four years later (3).

For the child, infection is the major killer during pregnancy and after birth, as well as low birth weight due to intrauterine growth retardation and/or pre-term birth. Congenital abnormalities are the second leading cause of death in high-income countries (5). In the United States, these anomalies, along with sudden infant death syndrome and premature birth, account for more than 50 per cent of all infant deaths (6). Approximately 3–10% of these cases have been attributed to exogenous and environmental agents (6). Scientific studies reveal that exposure during the early months of pregnancy can lead to an increased likelihood of mental retardation and development disabilities (7). The scope for reducing unnecessary disability and ill health is also considerable, through the application of interventions that are already known to be effective such as vaccination against rubella (which causes birth defects in 90% of children if contracted early in pregnancy). Avoiding alcohol and stopping smoking have beneficial effects on the unborn child. One measure of success will be a decrease in the number of low birth weight babies (below 2,500 grams) (8).

NEONATAL PERIOD

The first 28 days, the neonatal period, are critical. It is also during this time that the child is at highest risk for death. Of the approximately 7 million infants, who die each year, about two-thirds die in the neonatal period. Improving newborn survival will dramatically reduce infant mortality worldwide. Ninety-eight percent of all neonatal deaths occur in developing countries. Perinatal conditions, many of which are significantly influenced by environmental conditions, account for 20 per cent of the under-five mortality rate worldwide (4). Asphyxia can kill the baby if it is not given adequate basic treatment. Hypothermia, often interacting with low birth weight or infection is a major risk. Failure to initiate early and full breastfeeding contributes to this set of events.

Neonatal health is largely a product of socio-economic circumstances, access to appropriate services at the time of delivery as well as during the antenatal period, and parental education. Success in reducing neonatal mortality requires many components: caring families, availability of adequate healthcare, ability to recognize when a sick child needs professional care, good nutrition, and support from communities. It is during this time that the fundamental health and feeding practices are established.

EARLY CHILDHOOD

Over 40% of the global burden of disease is attributed to environmental risks that affect children under five, although this age group only accounts for 10% of the world‘s population (9). Each year more than 10 million children in low-and middle-income countries die before they reach their fifth birthday. Seven in ten of these deaths are due to just five preventable and treatable conditions: pneumonia, diarrhoea, malaria, measles, and malnutrition, and often to a combination of these conditions (10). There are many biological environmental factors associated with this high toll, among them the lack of clean water and sanitation, as well as environmental-related diseases such as malaria and dengue fever. Throughout Europe, the incidence of food-borne diseases continues to increase, with the main burden falling on children under 10 years. Infants aged between 6 to 12 months are at greatest risk as the protection from breast-milk declines and the potential hazards from weaning foods increase (9).

Many of the childhood communicable illnesses can be avoided through the efficient organization and management of immunization programmes. World Health Organization (WHO) and UNICEF addressed the care for illnesses in young children by developing a strategy „Integrated Management of Childhood Illness“ (IMCI). IMCI is an integrated approach to child health that focuses on the well being of the whole child. It aims to reduce death, illness and disability, and to promote improved growth and development among children under 5 years of age (10).

Young children are particularly susceptible to environmental threats because of the rapid development of their immune, respiratory and nervous systems. The metabolic functions of young children are in a dynamic state of development. Any irritants, such as air and water pollutants, encountered during these early stages of growth may permanently impair the development of these vital organs. Children breathe more air, drink more water and eat more food than adults do per unit of body weight, and this higher rate of intake results in greater exposure to pathogens and pollutants (11). Brain development is much more vulnerable to environmental influence than was previously suspected, and the influence of early environmental quality on brain development is long lasting (17). Small children are also curious and learn by exploring their world, for instance, by putting their hands and objects in their mouths, they also crawl and play on the ground and are at risk from pathogens and pollutants on these surfaces. Close parental care and supervision is, therefore, crucial to the safe and healthy development of young children.

Inappropriate nutrition is a major cause of poor health outcomes. WHO has estimated that globally 27% of children under 5 years are underweight (12) and there are wide variations also between the European countries (13). Appropriate feeding practices stimulate psycho-social development, lead to improved nutrition and physical growth, reduced susceptibility to common childhood infections and better resistance to cope with them. Improved health outcomes in young children have long-lasting health effects throughout the life span. Much has already been done in recent decade to promote breastfeeding. As a result, increasing breastfeeding prevalence rates are reported from a number of countries (14, 15). However, a continuing great concern led WHO to develop a global strategy for infant and young child feeding (16).

It is essential also to provide a stimulating environment for psychosocial development. Medical and educational research has shown that the development of intelligence, personality and social behaviour occurs most rapidly in humans during their first three to four years (4). Parents are the children’s earliest teachers, Therefore, strengthening the ability of the mother and all family members to care for and stimulate their children and encourage them to learn can set the stage for adult success.

Child abuse and neglect manifest themselves during the first years of life in every country. For instance 60% of children in Europe and central Asia say they face violent or aggressive behaviour at home (9). The health consequences can be physical, sexual and reproductive, psychological and behavioural, or lead to long-term, chronic disease.

Accidents and unintentional injuries also become more prevalent as the child increasingly starts to explore his or her environment, often without the necessary coordination or awareness of hazards. Drowning, falls, fires, accidental poisoning and traffic accidents account for some of the disability and deaths in this age group (3).

Both, prevention and care for illnesses are very important for young children, and both focus primarily on the mother and other caretakers. Prevention that contributes to the healthy development of the young child includes important issues such as breastfeeding and the appropriate introduction of complementary foods, hygiene practices, immunization and caring behaviours.

EARLY SCHOOL AGE

Globally, most deaths among older children are due to diseases that can be prevented, but that can also be treated easily. An appropriate and timely health care is essential. Vaccines protect a child against the childhood diseases, other diseases, such as diarrhoea and hepatitis A can be prevented by good hygiene and sanitary practices. Childhood cancers are a major concern in developed countries. In the United States, cancer is the second biggest killer of children after accidents, with the median age of child victims of cancer being six years old (18). Acute leukaemia is the most common type of cancer found in children, and its incidence appears to be rising in some developed countries. Among the environmental factors that may play a role are tobacco smoke, radon, asbestos, ultraviolet light radiation, hazardous waste and some pesticides (18).

Helminth diseases, which are caused by intestinal worms found in soils and vegetables, are one of the common health problems among school age children in developing countries. These children commonly carry large loads of helminths, which can cause anaemia and other debilitating conditions. These illnesses can result in impaired learning, poor school performance and more absences from school (19).

Poor nutrition remains globally a major contributor to childhood diseases and deaths. In countries with plentiful food provision, the cheapest form of food energy comes regrettably from fats, oils and sugar. Consumption of these energy-dense foods, together with lack of physical activity, results in increasing prevalence of obesity among children (9).

New health challenges emerge as children become increasingly exposed to the wider physical and social environment. Injuries, usually road traffic injuries, falls and drowning, are now the number--one killer of children aged five to 14 years in developed countries (5). Additional factors such as exposed cooking set-ups, dangerous tools and equipment, open sewers, construction or electrical sites and hazardous chemicals pose threats in developing countries.

Parental lifestyle increases its impact as the child develops. Attitudes to health-related behaviours such as smoking and physical activity are formed, and eating patterns become established. As social interaction beyond the family develops, the school environment, peer pressure and the mass media become increasingly influential in establishing the child's values, attitudes and behaviour patterns. School is an important place for bringing about behavioural changes, promoting better health for students, and teaching about caring for the community environment.

For this age group, both prevention and the appropriate care of illness are essential. As a child moves through the school-age years and into adolescence, prevention of behaviours that can lead to health risks takes on a greater importance.

ADOLESCENCE

One in every five people in the world is an adolescent – defined by WHO as a person between 10 and 19 years of age. Out of 1.2 billion adolescents worldwide, about 85% live in developing countries. Every year, an estimated 1.7 million persons between ages of 10 and 19 lose their lives (20). There are relatively few deaths due to illnesses. Many adolescents die prematurely due to other causes such as accidents and risky behaviour. Many habits and lifestyle choices that start during these critical years contribute greatly to the overall health of an adult. The WHO estimates that 70% of premature deaths among adults are largely due to behaviour initiated during adolescence (20).

Physical and emotional development accelerates with the arrival of puberty, and the young adolescent becomes ever more subject to cultural influences, perceived social norms and pressure from friends although the family support continues to be of significance. It is a normal part of adolescent development to take on new responsibilities and roles which can incur risks, to renegotiate relations with adults in the family and community and with peers, to experiment with things symbolic of adult life. Growing independence is associated with increased risk-taking. Accidents, violence, and suicide are among the three most common causes of death in adolescence (4). Adolescence is also a period of experimentation and rebellion against authority. This is the age when the use of tobacco, alcohol and drugs can become established habits. Their use is a major contributing factor to accidents, suicides, violence, unwanted pregnancies and sexually transmitted diseases among young people in many countries. There is an urgent need to create safer and more supportive environments within which young people can develop. Adult role models, positive peer influence and initiatives such as Health Promoting Schools (9) all have an important part to play in healthy adolescent development.

Sound nutrition remains a foundation stone for good health as the child progresses towards adulthood. However, in many countries, overweight and obesity in children and adolescents is increasing, often co-existing with micronutrient deficiencies (9). Type II diabetes, previously a disease of middle age, is now increasingly being reported among young people in European countries (3).

Pre-existing mental health issues may worsen as the adolescent undergoes this demanding phase of emotional and physical maturation. Impaired mental health is a precursor or consequence of many above-mentioned health-risky behaviours. Adolescence is also a peak age of onset for serious mental illness. In the European region, the incidence of psychological ill health and mortality increases as a consequence of the breakdown of traditional social and family structures, particularly in those communities experiencing significant societal, political and economic change. About 10% to 20% of children have one or more mental or behavioural problem (9).

Chronic conditions include non-communicable diseases such as asthma, cystic fibrosis, juvenile diabetes, epilepsy, juvenile arthritis and haemoglobinopathies such as sickle-cell disease, and mental disorders (4). Chronic conditions typically require comprehensive, ongoing care. Other factors such as family, school or college situations, as well as the health and social services available, determine how a chronic condition is managed. In developed countries, asthma is the leading chronic disease among children. Over the last few decades, asthma and allergies have increased throughout Europe, in Western Europe, the symptom rate is up to ten times that in eastern countries (21). Air pollution, both indoor and outdoor, is one of the triggers for asthma episodes (4).

The HIV/AIDS pandemic is one of the most important and urgent global public health challenges. It is estimated that 50% of all new HIV infections are among young people. In the Eastern part of European region, 84% of new cases are under 30 years of age, compared to 31% in the West, and three quarters of them are injecting drug users (9). Adolescents are therefore at the centre of the pandemic in terms of transmission, impact, and potential for changing the attitudes and behaviours that underlie this disease. Focusing on young people is likely to be the most effective approach to confronting the epidemic.

With adolescence comes reproductive maturity. Preventing teenage pregnancy is a concern for every country. The rates in Western European countries mostly range between 13 and 25 per 1,000 young women aged 15 to 19 years. (3). Unwanted pregnancies may lead to serious health consequences for young women, including the risks associated with dangerous or illegal abortions. Young mothers under the age of 20 years are more likely to deliver a low birth weight baby. Low birth weight is associated with reduced health prospects for the child. In this way, the child and adolescent life circle of one generation concludes and evolves into the life cycle of the next generation and thus interventions in one generation will bring benefits to successive generations.

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