Chapter 4

Physical Fitness in Children

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Abstract

This abstract provides a concise overview of "Physical Fitness in Children," a seminal work examining the multifaceted construct of physical fitness within pediatric populations. The text comprehensively analyzes the physiological, psychological, and sociological determinants influencing children's fitness levels, emphasizing its critical role in promoting long-term health and well-being. It systematically addresses various components of physical fitness, including cardiorespiratory endurance, muscular strength and endurance, flexibility, and body composition, detailing validated assessment methodologies and normative data relevant to different age groups.

The book meticulously explores the impact of physical activity patterns, sedentary behaviors, and nutritional habits on the development and maintenance of childhood physical fitness. Furthermore, it delves into the intricate relationship between physical fitness and cognitive development, academic performance, and psychosocial well-being, highlighting the holistic benefits of an active lifestyle from an early age. Chapters are dedicated to understanding the biological mechanisms underpinning fitness adaptations in children, as well as the environmental and policy-level interventions designed to foster increased physical activity and improved fitness outcomes. By synthesizing current research and theoretical frameworks, this work offers invaluable insights for researchers, educators, healthcare professionals, and policymakers dedicated to enhancing the physical health of the next generation.

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Introduction

Physical Activity

Any bodily movement produced by skeletal muscles that results in energy expenditure is defined as physical activity (Caspersen, Pereira, & Curran, 2000; Gallahue, 1982).

Physical activity offers numerous benefits, which are generally categorized into three main areas: physiological, cognitive, and psychosocial. When examining its physiological benefits, current research indicates that physical activity positively influences children's growth and development processes, enhances metabolic functions, and helps prevent chronic diseases. (Chakravarthy & Booth, 2004; Çabuk et al., 2024; Çiftçi et al., 2023). Additionally, one of the most well-known benefits of physical activity is its ability to increase bone mineral density, thereby reducing the risk of osteoporosis later in life. (Özyürek, 2018). Children who engage in sufficient physical activity in their daily lives experience significant increases in bone mineral density, leading to stronger bones. Additionally, children who maintain an active lifestyle demonstrate improved joint range of motion, enhanced flexibility of muscles, tendons, and ligaments, and healthier spinal alignment. These factors play a crucial role in preventing postural disorders in children.(Ot, 1994). A study involving 150 boys and 143 girls examined the relationship between physical activity levels and femur development. The mean age of the participants was 9.7 years, and physical activity levels were measured using accelerometers. Femur development was calculated as a composite score of factors including bone mineral density, hip axis length, and total lean body mass. The results indicated that children who engaged in at least 25 minutes of regular and vigorous physical activity daily exhibited better femur development. (Sardinha, Baptista, & Ekelund, 2008).

The development of cognitive structures and perceptual performance is closely related to motor skills, and the advancement of these skills requires adequate movement and sensory experiences. (Sallis, Prochaska, & Taylor, 2000). Through exercise, children acquire knowledge about various physical concepts such as fast-slow, near-far, and up-down. It has been observed that engaging in intensive physical activities enables children to gain extensive experiences over time, leading to neuronal growth that enhances brain performance. (Ungerer-Röhrich, Eisenbarth, Popp, Quante, & Wolf, 2011). Physical activities are perceived by sensory organs and are considered specialized sensory experiences. This indicates an inseparable relationship between physical activity and intellectual development. For example, children who can walk backward proficiently are often reported to

have fewer difficulties with subtraction operations in mathematics. (Orhan, 2019). In addition to all these, physical activity positively contributes to the development of children's cognitive and mental functions such as attention, concentration, academic achievement, and spatial imagination. (Saygin, Polat, & Karacabey, 2005).

In recent years, the increased use of technology has become commonly associated with a rise in symptoms of stress, anxiety, and depression among children. Correspondingly, there has been an increase in the number of adolescents who avoid social interactions and tend to isolate themselves. Research indicates that physical activity positively influences children's mental health and enhances their ability to cope with negative factors such as stress. (Meydanlıoğlu, 2015). Research also demonstrates that children who are regularly active and participate in activities exhibit increased levels of self-confidence, self-esteem, and self-efficacy. (Baydemir, 2012). In a study conducted with 417 university students, the effect of students' physical activity levels on their psychological well-being was examined. (Elmas, Yüceant, Hüseyin, & Bahadır, 2021). According to the research findings, students with higher levels of physical activity demonstrated higher scores of psychological well-being. Furthermore, the effect of physical activity on the treatment of more severe mental disorders was examined, revealing that patients who engaged in regular and sufficient physical activity experienced a reduction in psychological symptoms. (Bay & Yılmaz, 2020).

In conclusion, developing physical activity habits in children promotes both physical and mental health, enabling them to integrate harmoniously within society. This can play a vital role in the formation of a healthy community. (Leger, Mercier, Gadoury, & Lambert, 1988).

Physical Fitness

"Physical fitness is the ability to perform a task successfully." (Gutin, Manos, & Strong, 1992). In other words, physical fitness refers to the ability to successfully perform physical activities. It encompasses various attributes such as cardiovascular endurance, muscular endurance, muscular strength, power, speed, flexibility, agility, balance, reaction time, and body composition. These characteristics hold different significance in terms of athletic performance and health. Accordingly, they are categorized as skill-related physical fitness and health-related physical fitness. (Pınar, Erkut, & Saygın, 2002).

Components of Skill-Related Physical Fitness

Skill-related physical fitness (SRPF) includes attributes such as speed, agility, coordination, power, and quickness. (Graham, 2001).

Speed

Speed is one of the motor skills that determine performance in sports. The improvement of speed is more limited compared to other motor skills because it depends largely on the individual's genetically determined physiological potential. Achieving success in different sports requires varying levels of specific speed. Speed is defined as the ability of the body to perform a movement in the shortest possible time and is measured in meters per second (m/s). (Gutin et al., 1992).

Speed refers to the ability to successfully and rapidly perform a specific action or complete a certain distance in the shortest possible time. Running speed in boys shows a consistent increase from ages 5 to 17. In girls, speed increases until around ages 11-12, followed by a slight change until age 17. (Gutin et al., 1992).

Agility

Agility is defined as the ability of the body to change direction quickly, smoothly, easily, and in a controlled manner while moving from one point to another (Gutin et al., 1992). Agility develops rapidly until around the age of 12, that is, until the onset of puberty. Three years after this period, agility performance tends to decline. After this rapid growth phase, agility increases once again until maturity is reached. Before puberty, there is little difference in agility performance between boys and girls; however, after puberty, boys generally demonstrate better agility performance than girls.(Erol, 2011).

Coordination

Coordination, one of the skill-related components, refers to the harmonious functioning of different parts of the body and the control of movements. It is a fundamental ability that enables children to succeed in daily life and sports activities. Particularly during sports or play, coordination skills allow children to integrate and perform movements in conjunction with other physical abilities such as speed, balance, flexibility, and strength. (Caspersen et al., 2000).

Velocity

Power is defined as the ability to perform actions in the shortest possible time or to move the body or a part of it at maximum speed. (Papaiakovou

et al., 2009). Power requires the rapid and coordinated functioning of the musculoskeletal system and the nervous system for optimal performance. (Saygin et al., 2005). Additionally, power emphasizes the necessity of force to reach a specified distance in the shortest possible time. Therefore, it indicates that power is a force-dependent attribute. (Pekel, Bağcı, Onay, Balcı, & Pepe, 2006). The contraction speed of muscles depends on the type of muscle fibers. Athletes possessing Type II muscle fibers perform movements more rapidly. (Gambetta, 1996). The attribute of power is more heavily influenced by genetic factors. It can be improved by a maximum of 10-15% through the development of aerobic and anaerobic capacities. (Günay, Cicioğlu, Şıktar, & Şıktar, 2017). Research indicates that speed performance increases with age at a similar rate in both girls and boys; however, after puberty, this increase becomes more pronounced in boys. (Papaiakovou et al., 2009).

Quickness

Quickness refers to children's ability to respond and move rapidly during sports activities, games, and daily life. This skill not only enhances children's physical performance but also helps reduce the risk of injury. Particularly in sports settings, the development of quickness enables children to be more successful in competitive environments and improves their performance. Moreover, improving quickness contributes to the enhancement of children's motor skills and coordination, thereby elevating their overall level of physical fitness. (Bay & Yılmaz, 2020).

Balance

Balance is the ability to stabilize other parts of the body while a portion is in motion. It is a crucial parameter that allows the body to respond and adapt to various postures and positions. Maintaining balance, whether stationary or in motion, is a fundamental component of skill-related physical fitness. (Çalışkan & Yeşil, 2005).

Health-Related Physical Fitness Parameters

Flexibility

Flexibility refers to the range of motion possible at a specific joint or series of joints. A joint with limited bending or extension capability is termed hypomobile, whereas a joint with excessive flexibility is referred to as hypermobile. Although flexibility is an important component of physical fitness, it is often overlooked. Insufficient flexibility can cause numerous problems, especially in middle-aged and elderly populations. Adequate

flexibility is necessary for efficient and effective functioning in daily life. (Corbin & Lindsey, 1997). Therefore, joint range of motion is an important component in determining physical fitness and is measured using methods such as the sit-and-reach flexibility test. (Ayala, de Baranda, Croix, & Santonja, 2012).

Muscular Endurance

Muscular endurance is the ability of a muscle group to repeatedly perform similar movements or tensions, or to maintain a certain percentage of maximal voluntary contraction statically over a period. Good endurance delays the onset of fatigue. In children and adolescents, muscular endurance is assessed and developed by measuring the number of repetitions performed in exercises such as sit-ups, push-ups, and pull-ups within 30 seconds.(Welk & Blair, 2008).

Cardiovascular Endurance

Cardiovascular endurance is the ability of the heart, lungs, and circulatory system to efficiently perform moderate to high-intensity activities over an extended period. Maximal oxygen consumption (VO_2 max) is an accepted parameter for measuring changes in cardiovascular endurance. (Kılıç, 2007). Aerobic power, the most important indicator of physical fitness and closely related to the cardiovascular system, is the key physiological criterion determining athletes' work capacity. Defined as the maximum amount of oxygen consumed per minute during exercise, aerobic power depends on the cardiovascular system's ability to deliver oxygen to the working muscles and the utilization of oxygen by cells for energy production. It has been observed that maximum aerobic power is typically reached between the ages of 15 and 17.(Gökdemir, Koç, & Yüksel, 2007).

Gallahue's Motor Development Theory

Motor development is a field that examines changes in motor behavior as a result of internal and external interactions. Gallahue limited motor development to childhood and explained this progression through a pyramid model. According to the pyramid model, each stage of motor development builds upon the previous one. The foundation of the model is the reflexive movement phase. Built upon this foundation are, in order, the rudimentary movement phase, the fundamental movement phase, and finally, the specialized movement phase associated with sports. (Gallahue, 1982).

Reflexive Movement Phase

Reflexes are involuntary, automatic movements controlled by the lower brain that form the foundation of motor development stages. (Gallahue, Ozmun, & Goodway, 2014). These involuntary movements, which begin in the womb, form the foundation of motor development. Control of behaviors gradually shifts from the spinal cord and midbrain centers; as the cortex develops, reflexive movements diminish.(Mengütay, 2005). This phase consists of two stages. The information encoding stage spans from the fetal period to the fourth month of infancy and is characterized by observable involuntary movements. The lower brain centers respond involuntarily to stimuli of varying intensity and duration, producing reflexive actions such as sucking, rooting, and protective movements.

The information decoding stage is when the lower brain centers gradually relinquish control over skeletal movements, yielding to the motor areas of the cerebral cortex. During this phase, voluntary movements begin to develop, and the infant starts to move consciously.

Primary (Primitive) Reflexes	*Postural Reflexes*
☐ Moro Reflex	☐ Stepping Reflex
☐ Asymmetric Tonic Neck Reflex (ATNR)	☐ Parachute Reflex
☐ Rooting and Sucking Reflex	☐ Pulling Reflex
☐ Palmar Reflex	☐ Crawling Reflex
☐ Plantar Reflex	☐ Swimming Reflex
☐ Babinski Reflex	

Primitive Reflexes and Postural Reflexes (Çoknaz, 2016)

Primitive Reflexes

Moro Reflex

The Moro reflex is observed in infants shortly after birth. This reflex is triggered by unexpected movements, such as a sudden jolt or the head dropping forward. It is characterized by the infant initially spreading the arms and legs, extending the arms and legs outward, followed by bringing the arms together. Typically, the Moro reflex disappears around 4 to 6 months of age. This reflex is considered an indicator of the development and healthy functioning of the nervous system in infants.(Tüfekçioğlu, 2002).

Asymmetric Tonic Neck Reflex (ATNR)

The Asymmetric Tonic Neck Reflex (ATNR) is observed in infants from birth. This reflex becomes evident when the infant turns their head to one side, causing the arm and leg on the same side to extend while the arm and leg on the opposite side flex. In other words, when the infant turns their head to one side, the limbs on that side extend, and the limbs on the other side bend. This reflex may aid in the development of head control and coordination of body limbs. Typically, the ATNR disappears between 4 and 6 months of age. If this reflex persists beyond this period, it may indicate a developmental issue or neurological disorder. (Tüfekçioğlu, 2002).

Rooting and Sucking Reflex

The rooting and sucking reflexes are natural behaviors exhibited by infants immediately after birth. These reflexes assist infants in meeting their feeding needs.

Rooting Reflex: When an infant's face or cheek is gently touched, the baby turns their head toward the stimulus. This reflex helps the infant locate the mother's breast or feeding source.

Sucking Reflex: When an object touches the infant's mouth or a finger is placed inside, the baby automatically performs a sucking motion. This reflex enables the infant to suckle from the mother's breast. The sucking reflex is crucial for meeting the infant's nutritional needs and initiates the feeding process. (Çalışkan & Yeşil, 2005).

Palmar Reflex

The palmar reflex is a congenital reflex observed in infants and is elicited by stimulation of the palms. This reflex involves the infant's automatic response to close their fingers and grasp tightly when something touches their palms. In other words, when the infant's palm is gently stimulated, they instinctively close their fingers around the object and grip it.

The palmar reflex is typically prominent during the first few months after birth. When infants exhibit this reflex, they grasp firmly when something is placed in their hands by a caregiver. This reflex may help strengthen the palms and develop grasping skills. However, as the infant grows and gains better muscle control, the palmar reflex usually disappears, and the child begins to use their hands more voluntarily.(Çalışkan & Yeşil, 2005).

Plantar Reflex

Also known as the grasp reflex of the foot, the plantar reflex typically lasts longer than the palmar grasp reflex.(Çalışkan & Yeşil, 2005).

Babinski Reflex

The Babinski reflex is elicited when the outer edge of the sole is gently stroked, causing the big toe to dorsiflex (curl upward) and the other toes to fan out. This reflex is commonly observed in infants and young children. However, its presence in adults may indicate a neurological disorder. (Çalışkan & Yeşil, 2005).

Postural Reflexes

Stepping Reflex

The stepping reflex is observed in infants during the first few months after birth. This reflex is elicited when the soles of the infant's feet are touched or when the infant is held in an upright position. When displaying the stepping reflex, infants move their feet up and down in a walking-like motion.

The stepping reflex is considered a preparatory phase for the development of a natural walking response in infants. However, if this reflex does not disappear or persists for an extended period, it may indicate a neurological problem. Therefore, the stepping reflex is often used as a test to assess infant development. (Çalışkan & Yeşil, 2005).

Parachute Reflex

The parachute reflex is observed in infants between approximately 6 and 9 months of age. This reflex involves the infant extending their arms to protect themselves when they sense their body is falling forward. When the infant is tilted forward or moved quickly forward while being held unsupported, they extend their arms and attempt to balance their body. The reflex is named after the way a parachutist spreads their arms and legs during free fall.

Pulling Reflex

When an infant is held by one or both hands while sitting and gently pulled backward, they respond by flexing their arms and attempting to pull themselves forward to stand. This reflex typically appears around the 3rd to 4th month and persists until approximately the 12th month.(Tüfekçioğlu, 2002).

Crawling Reflex

The crawling reflex is observed in infants during the first months after birth. This reflex involves the infant's response to move forward using their hands and knees while lying on their stomach. When displaying the crawling reflex, the infant propels themselves forward by coordinating movements of the hands and knees. This behavior reflects the infant's desire to move and explore their environment. The crawling reflex enhances mobility and aids infants in exploring their surroundings. (Tüfekçioğlu, 2002).

Swimming Reflex

When held in a prone position in water, infants exhibit rhythmic arm and leg movements resembling swimming strokes (Tüfekçioğlu, 2002). Their eyes remain open, and they hold their breath for a certain period.

Primitive Movements Phase

The fundamental movement phase consists of the basic forms of voluntary movements necessary for an infant's survival, continuing until approximately two years of age. These movements develop through both biological and environmental factors and include balance movements involving control of the head, neck, and trunk; manipulative movements such as reaching and releasing; and locomotor movements such as crawling and walking. Although the sequence of skill development remains consistent during this maturation process, the duration of each stage can vary. (Gallahue et al., 2014).

The suppression phase of reflexes occurs as the cortical areas develop, leading to a gradual reduction of reflexes and the emergence of voluntary movements. Since the neuromuscular system is still developing, movements are goal-directed but may lack full control.

The initial control phase is when perceptual and motor information are integrated more meaningfully and appropriately. Around the age of one, the learning of balance, locomotor, and manipulative skills begins. (Cvejić, Pejović, & Ostojić, 2013)

Fundamental Movement Phase

The fundamental movement phase occurs between the ages of two and seven, during which children actively experiment with and explore the movement capabilities of their bodies. While maturation may not be the primary influence during this period, environmental conditions,

opportunities, motivation, and instruction play significant roles in the development of fundamental movement skills. (Gallahue et al., 2014).

During this period, children develop balancing, locomotor, and manipulative movement skills. They explore how movements are performed individually and then combined. Initially, actions such as running, jumping, climbing, catching, and hopping are performed separately; later, these movements are integrated to form complex movement combinations. (Aşçı & Kirazcı, 2014). During this period, three sequential stages occur:

The initial stage refers to the first attempts of children aged two to three years to perform fundamental skills. During this period, movements are at an early developmental level. The rhythmic quality and flow of movements are generally weak, and body usage may be limited or exaggerated. (Karakaş, 2018).

The shaping stage occurs in children aged three to five years. During this phase, greater motor control and rhythmic coordination of fundamental movement skills begin to develop, although movements may still be limited or exaggerated. (Karakaş, 2018).

The mastery stage is the phase during which children become mechanically efficient, controlled, and coordinated in their movements. This stage typically occurs between the ages of five and six. Fundamental movement skills are reinforced and developed through encouragement and learning opportunities. However, the absence of such opportunities can negatively impact the development of basic skills and hinder the transition to the specialized movement phase. There is a connection between mastery and the acquisition of specialized skills; mastery of fundamental movement skills facilitates the learning of more complex and specialized abilities. During this process, the competency barrier plays a key role by enabling the transition and application between the two phases. (Karakaş, 2018).

Specialized Movement Phase

In Gallahue's pyramid model, the phase referred to as the sports-related movement phase, now termed the specialized movement phase, encompasses mature fundamental movement patterns that are developed and integrated to form sports skills and other specialized, complex abilities. Most children, around the age of six, possess the potential and capability to perform most fundamental movements at the mastery level, supported by neural development, anatomical-physiological characteristics, and visual perception abilities. (Gallahue et al., 2014).

This period is also characterized by children's increased effort to develop sports skills and their greater openness to practicing movements compared to adults. Emphasizing the importance of play and leisure activities, children are encouraged to gain experience in various areas through diverse and regular activities rather than specializing in a single domain. (Barker, McCarthy, Jones, & Moran, 2011).

During this phase, the extent to which a child's skills develop depends on a wide range of mental, emotional, and psychomotor factors specific to the individual's abilities. Factors such as reaction time, movement speed, coordination, body type, height, weight, habits, peer pressure, and psychological makeup are among these influences. The goal of movement at this stage is not only to learn how to move but also to use movement as a tool to perform various complex actions in competitive and cooperative games, recreation, sports, dance, and leisure activities. It is a period during which balance, locomotor, and manipulative movements are integrated, coordinated, and refined. (Mengütay, 2005). The specialized phase consists of three overlapping stages: the transition stage, the application stage, and the lifelong application stage. These stages vary based on the movement skills acquired during the fundamental movement phase and are influenced by environmental, individual, and task constraints, which act as stimuli for transitioning from one phase to another. (Gallahue et al., 2014).

The transition stage occurs around the ages of seven to eight, during which children combine fundamental movements and demonstrate transitional skills such as skipping and kicking a ball. Children are actively engaged in the process of integrating and applying various movements. It is recommended that activities aimed at enhancing motor control and movement competence be provided in this stage.(Elmas et al., 2021).

The developed fundamental movements are utilized in daily life and play activities. Since the constraining effects of physiological, anatomical, and environmental factors are not yet fully recognized at this stage, children may show interest in a wide range of sports disciplines. The skills acquired during this phase resemble those in the fundamental movement phase but involve greater form, accuracy, and control. (Aşçı & Kirazcı, 2014).

The application stage occurs between the ages of eleven and thirteen, during which children, with their increasing cognitive abilities, make numerous learning and participation decisions based on task-related, individual, and environmental factors. At this stage, individuals are aware of environmental, personal, and functional constraints. Depending on their

characteristics, individuals may choose to participate in or avoid certain activities during the application stage. (Gallahue et al., 2014).

Sports provide individuals in the transition and application stages with ample opportunities to engage in vigorous physical activity to develop their skills. Competitive events, leisure activities, cooperative recreational activities, and dance are particularly beneficial for children during these stages. (Elmas et al., 2021).

The lifelong application stage begins at around fourteen years of age and continues throughout life. It is considered the peak of motor development and the phase in which activities accumulated from previous stages are applied to daily life, recreation, and sport. Performance becomes more automatic during this stage. Factors such as money, time, facilities, equipment, physical and mental conditions, participation levels, skills, opportunities, and motivation influence this phase. (Özer, 1999).

Erikson's Psychosocial Development Theory

According to Erikson, development is a continuous process that extends from birth to the end of life. An individual builds upon cognitive and social growth initiated during childhood by incorporating new learnings throughout life. Both genetic and environmental factors influence this development. Erikson posits that there are eight fundamental stages of development in a person's life. (Vural, 2023).

Basic Trust vs. Mistrust (0-1 Year)

During this period, the consistent fulfillment of an infant's basic needs such as feeding, cleaning, digestion, and attention lays the foundation for the development of a trust bond between the mother and the infant. Consistent satisfaction of these needs fosters the development of a positive sense of trust. Infants begin a healthy physiological and cognitive developmental process with confidence in their mother's presence. If the mother fails to adequately respond to these fundamental needs, it may result in mistrust and distress in the infant. The infant's ability to develop trust toward people and society during the process of becoming an individual depends on the quality of the bond with the primary caregiver (mother).(Vural, 2023).

Autonomy vs. Shame and Doubt (1-3 Years)

During this stage, children begin to become aware of their own behaviors. They receive praise for positive behaviors and warnings for negative behaviors from their parents. Receiving praise positively influences the development of the child's self-confidence, whereas overly harsh reprimands can lead to

feelings of shame. During this period, children should be supported by their parents to explore their environment, enabling them to take the first steps toward gaining autonomy. (Vural, 2023).

Initiative vs. Guilt (3-6 Years)

Between the ages of three and six, motor and language development become prominent in children. This stage triggers curiosity and fosters a drive for exploration of the environment. It is a period during which children's initiative behaviors can be observed to gain insights into their interests. They should not be judged for their interests but rather supported. Conversely, children who are given complete freedom without guidance may experience negative effects on moral development. The key is to support the child's interests while also providing warnings for harmful behaviors, maintaining a balance between the two. (Erik Homburger Erikson, 1964).

Industry vs. Inferiority (7-11 Years)

During this age range, children begin school and regularly engage in social interactions with their peers. In this process, children may develop a tendency to compare themselves with others. As the sense of achievement becomes prominent, children strive to demonstrate their skills and seek recognition. For the positive development of self-esteem and confidence, it is important not to impose excessive responsibilities or expectations beyond the child's capacity during this stage. Instead, children should be guided towards areas where they can succeed and have potential, and be encouraged accordingly. (Erik Homburger Erikson, 1964).

Identity vs. Role Confusion (11-17 Years)

This period is characterized as the stage when the child becomes aware of their physical development. During this time, the individual embarks on a journey of identity exploration and often exhibits a tendency to select role models, imitating the behaviors of those they admire. Successfully navigating this phase is crucial for healthy identity development. To form their identity, individuals may explore various groups, ideologies, teachings, and beliefs. Additionally, behaviors such as rejecting authority, rebellion, and the pursuit of freedom may also emerge during this stage. (Vural, 2023).

Intimacy vs. Isolation (17-30 Years)

During this period, adult relationships and career planning come to the forefront, and the individual's character begins to stabilize. As the person assumes social roles, concerns and anxieties about the future arise. It is important for the individual to have developed feelings of trust and love

to prevent these thoughts from leading to significant crises. Otherwise, behaviors such as withdrawal and social isolation may occur. (Vural, 2023).

Generativity vs. Stagnation (30-60 Years)

During this period, marked by significant career advancements and family formation, individuals may experience a desire to leave a lasting legacy. Each person's way of fulfilling this desire may differ. Some achieve this fulfillment by choosing professions that benefit society, while others may experience it through marriage and parenthood. Individuals who fail to establish personal goals during this stage may experience feelings of stagnation or unproductiveness. Seeking support from their social environment can have a positive impact in overcoming these feelings. (Erik H Erikson, Erikson, & Kivnick, 1994).

Integrity vs. Despair (60+ Years)

If an elderly individual has experienced a satisfying childhood and youth, they enter a phase where they can enjoy the fruits of those periods. During their productive years, they can observe the knowledge they have passed on to future generations and the social contributions they have made, allowing them to feel a sense of fulfillment from a well-lived life. Conversely, individuals who have not realized their potential and unresolved conflicts may perceive their life as wasted and may experience feelings of despair and fear during old age. (Erik H Erikson et al., 1994).

Piaget's Cognitive Development Stages

Piaget proposed that individuals go through four distinct stages while attempting to understand the world. Each stage is age-dependent and involves different ways and forms of comprehending the world. Piaget believed that all individuals must sequentially pass through these developmental stages. These stages are, in order: the sensorimotor stage, the preoperational stage, the concrete operational stage, and the formal operational stage. (Yüksel, 2015).

According to Piaget's cognitive development theory, individuals perceive and learn about their environment and situations through the formation of schemas. These schemas, which can be subjective, objective, concrete, or abstract, are mental definitions or judgments formed in the mind. People tend to categorize observed events and objects into various groups, encoding them mentally.

Sensorimotor Stage (0-2 Years)

Known as the infancy period, this stage marks the beginning of the infant's process of making sense of their environment. Experiencing everything for the first time through seeing, hearing, and perceiving, the infant begins to explore the external world within the limits of their consciousness. This period, characterized by many firsts such as taking initial steps, first interactions with objects, and efforts to bond with the mother, initiates the infant's awareness of the world. Both physiologically and cognitively, the infant's capacity is limited during this stage, allowing only for the formation of basic and simple schemas. (Suat, 2011).

Preoperational Stage (2-7 Years)

Considering the preschool period, children develop skills such as walking and eating independently during this stage. Exposed to more stimuli and environmental inputs than in the previous phase, children become more inclined to learn due to the development of curiosity. A key characteristic of this stage is the beginning of reasoning; however, this reasoning is based on intuition rather than logic. Children often exhibit their responses impulsively during this period. (Suat, 2011).

Concrete Operational Stage (7-11 Years)

Coinciding with the period when the child begins school, this stage marks a shift from intuitive behaviors and impulsive reactions to logical thinking and basing actions on reason. With increased time spent among peers, environmental stimuli become abundant. The teacher assumes a new role as a model within the developmental process. The concrete operational stage is described as a transitional period representing the development of concrete thinking skills. (Nicolopoulou, 2004).

Formal Operational Stage (11-15 Years)

Beginning around the age of eleven, this stage continues throughout adulthood. Individuals develop the ability to think abstractly, reason hypothetically, and reflect on their own thoughts. Ideals are established, and they can compare themselves with others based on these ideals. Future opportunities are contemplated, and realistic, systematic solutions are applied to encountered problems.

The formal operational stage represents the final phase of cognitive development, after which cognitive growth is considered complete. However, a crucial aspect of this stage is that the completion of the process does not occur uniformly across individuals. Some individuals may never

reach this stage, while others may attain it much later. The effectiveness of the preceding developmental stages plays a significant role in this outcome. (Nicolopoulou, 2004).

Freud's Psychosexual Development Theory

According to Freud, newborn infants develop their personalities by progressing through different stages. Freud referred to these stages as "psychosexual development periods." He examined psychosexual development in five stages: Oral, Anal, Phallic, Latent, and Genital (Freud, 2016).

Oral Stage (0–1 Year)

The dominant principle during this stage is the pleasure principle; the immediate gratification of natural urges and the swift relief of tension are the child's primary expectations. This period is called the oral stage because the mouth and lips serve as special zones of pleasure, and the infant interacts with the world primarily through these areas. The mouth and lips aid in the recognition of objects, and by putting everything into their mouth, infants make developmental progress in exploring and understanding their environment. (Esencan & Rathfisch, 2017).

Anal Stage (1-3 Years)

This stage marks the period when the child begins to walk, talk, and perceive their self as separate from the environment, gradually developing the psychological foundations for independent desires and behaviors. According to psychoanalytic theory, the anal and urethral regions become zones of sexual pleasure. The child's ability to control defecation and urination, performing these actions when and where the mother desires, attracts significant attention from the environment. Consequently, the child encounters societal judgments such as good-bad, right-wrong, and shameful behaviors. During this period, the child may exhibit stubbornness, defiance, and messiness, often persistently withholding or inappropriately releasing feces. For this reason, the stage is also known as the anal stage. (Ersevim, 1997).

Phallic Stage (Ages 3–6)

Starting at the age of three, the genital organs themselves become the primary source of sexual pleasure. The most significant psychological challenge of this period is the Oedipus complex. The child, now aware of being a separate individual from others and the environment, begins to explore what kind of person they want to become. During this phase, the

child displays an intense and persistent curiosity about their own body, sexual differences, and everything in their surroundings. For this reason, this stage is also referred to as the "age of epistemophilia" or the "passion for knowing." The child becomes capable of distinguishing between the sexes and rapidly acquires knowledge of sexual taboos and social values.

According to Freud, during this stage, the male child develops a special affection toward his mother and enters into a rivalry with his father, often accompanied by feelings of hostility toward him. In contrast, the female child experiences affectionate feelings for her father and harbors resentment toward her mother. This phenomenon in girls was termed the Electra complex, although this term was not originally coined by Freud himself and did not gain widespread acceptance within Freudian psychoanalytic theory. (Ersevim, 1997).

The Latency Stage (Ages 6–12)

During this stage, the earlier psychosexual upheavals and conflicts subside and enter a dormant or quiescent phase. The child begins to learn gender role behaviors and develops a sense of identity by observing parental interactions, media influences, and same-sex peer relationships. Through modeling the behaviors and emotions of their parents, the child typically identifies with the parent of the same sex. In addition to parents, children also begin to form identifications with teachers and other adult figures. Their interests shift toward acquiring social and intellectual skills. However, it would be inaccurate to say that all sexual drivers and interests are entirely dormant during this period. Sexual curiosity and exploratory behaviors, such as sexual play, may still be observed in children at this age.(Beji & Aşcı, 2011).

The Genital Stage (Ages 12–18)

DurThe Genital Stage spans from approximately ages 11–13 through young adulthood. During this phase, the primary focus of sexual energy once again becomes the genital region. With the onset of puberty and increased hormonal activity, the intensity of various drives—particularly sexual ones—significantly increases. Conflicts and issues from earlier psychosexual stages may resurface, but the genital stage offers an opportunity to resolve them in new, more mature ways. Successful resolution leads to the development of a fully integrated adult identity. The central developmental task of this stage is for the adolescent to detach from dependency on parents and begin forming mature, reciprocal relationships—particularly with individuals of the opposite sex outside the family unit. This period is also marked by increased socialization, participation in group activities, the emergence of career

aspirations, and the desire to form a family of one's own.ng this stage, the earlier psychosexual upheavals and conflicts subside and enter a dormant or quiescent phase. The child begins to learn gender role behaviors and develops a sense of identity by observing parental interactions, media influences, and same-sex peer relationships. Through modeling the behaviors and emotions of their parents, the child typically identifies with the parent of the same sex. In addition to parents, children also begin to form identifications with teachers and other adult figures. Their interests shift toward acquiring social and intellectual skills. However, it would be inaccurate to say that all sexual drives and interests are entirely dormant during this period. Sexual curiosity and exploratory behaviors, such as sexual play, may still be observed in children at this age. (Ersevim, 1997).

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