

THE RELATIONSHIP OF EYE MUSCLE STRESS ON THE USE OF DEVICES TO HYPERACTIVE BEHAVIOR IN EARLY CHILDREN

Anita Damayanti,
Early Childhood Education, Faculty of Education,
Universitas Muhammadiyah Jakarta

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Anne Gracia,
Department of Postgraduate Early Childhood
Educational
Universitas Panca Sakti Bekasi

Retno Palupi,
Department of Postgraduate Early Childhood
Educational
Universitas Panca Sakti Bekasi

Siti Rodiah,
Department of Postgraduate Early Childhood
Educational
Universitas Panca Sakti Bekasi

Corresponding Authors:

anita.damayanti@umj.ac.id;

annegracia.alc@gmail.com;

palupinoya@yahoo.com;

tkislamassyifajohar@gmail.com;

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Abstract: *The use of gadgets in learning activities in rooms with very different light from one side and for entertainment by sleeping on your side has an impact on the work of the eye muscles being asymmetrical. Children who tend to be limited in their physical activity when they get the opportunity to move will look out of control. Hyperactive children have attention deficit disorders caused by minor damage to the central nervous system and brain, so the concentration range of sufferers becomes very short and difficult to control. There is often an error in conveying messages to the central nervous system, because of the weakness of the sensory nerves for the dominance of vision in the plan of motion at the proprioception stage. The difference in eye muscle movements that causes the visual perception process does not reach maturity for its relationship with the vestibular system produces a balanced, coordinated, and directed eye muscle movement. This will change the information that the brain responds to, resulting in non-normative behavior in children, and reading delays. This paper aims to determine the extent to which gadget user interactions cause eye health problems and normative actions that are often referred to as hyperactivity in early childhood. The analytical methodology of this theoretical study and research suggests eye exercises to assist vestibular stimulation for the benefit of motion control in children.*

Keywords: *Sensory, Vestibular, Gadget, Hyperactivity*

Introduction

Children quickly adapt to gadgets or devices, so assistance is needed so that children can use their gadgets safely and effectively. In terms of the use of software in the era of rapid development of digitalization, parenting plays an important role. Children during the pandemic use their devices longer than before due to the online learning process. The use of gadgets in learning activities in a room with a highly different light from one side and the use of gadgets for entertainment with a

prolonged side sleeping position have an impact on the work of the eye muscles being asymmetrical. Children who tend to be limited in physical activity when they get the opportunity to move will look wild/uncontrollable. The behavior of children who are difficult to calm down becomes a difficulty for parents or children's companions, especially when children are unable to sit still to do daily activities such as eating, playing, and others. Children keep moving as if they have a battery that never runs out. Various labels and stigmas are given to children with hyperactive tendencies. This topic is studied to discover the causes of children with excessive behavior not in the category of attention difficulties from brain work disorders. Disorders of the eye muscles from long-term use of gadgets and the habit of still using spectacles or games in a sleeping position cause children to experience visual disturbances, making them uncomfortable with interactions around them. Changes in the function of the eye muscles are one of the causes of children seeking balance through movement activities. Various studies that prioritize the work of sensory sensors based on theories and research to examine the potential for the vision for the balance system are part of the study by analyzing the theory of sensory integration and motion perception.

Literature Review

According to a report by the World Health Organization, stated that 285 million people in the world have visual impairments, 39 million people are blind, while another 246 million are recorded with low vision. Theoretical studies and previous research on eye movement disorders due to differences in the flexibility of the muscles that hold the eyeball experience muscle stress due to using gadgets.

Using gadgets is a skill set as a communication medium that expands the range of information, as a communication tool, or makes broader information. There are four functions of devices in digital literacy, namely:

- 1) Understanding: A wide range of information on device users.
- 2) Interdependence: today's world is interconnected. Digital media is a part of our daily life.
- 3) Social factors: Being the key to interacting with the use of devices, where media success is measured by the social breadth achieved
- 4) Curation: Future information can be used from data already stored on the device. Digital traces will be stored across time and the limits of human reach.

The interaction of gadget users causes eye health problems and normative actions that educators and parents call hyperactivity in early childhood. Children can quickly adapt to the use of gadgets or devices, so a network is needed in creating, evaluating, using, and interpreting mentoring so that children can use their gadgets safely and effectively (Haryanto & Bagas, 2018), interpreting education through games in gadgets is an educational tool for teachers to educate and teach fun. In terms of using the software at a time when digitalization is snowballing, parenting plays an important role. The parenting system is required to display good examples from parents to their children (Tridhonanto, 2014). Adverse effects of technological

advances for children: In addition to providing benefits, Youtube and digital technology also have a negative impact (Rahman et al., n.d):

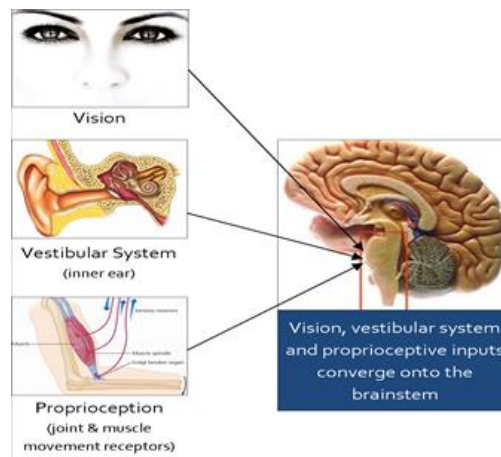
- 1) Decreased learning achievement
- 2) Cyberbullying
- 3) Limiting physical activity
- 4) Delays in language and social-emotional skills
- 5) Especially for children aged two years
- 6) Disorders of the eye (there is a limitation on the time of using the device)
- 7) Impaired concentration (checking gadgets more often)
- 8) Sleep disturbances (due to too long using gadgets/show content)
- 9) Lack of privacy, possible child predators, cyberbullying, personal data collection for unwanted things
- 10) The inculcation of negative values, violence, and pornography in the spectacle.

Definition of Hyperactivity or ADHD According to Barkley (Wood, 2007) is a disorder condition when the response that leads to a lack of self-regulation becomes blocked and experiences a dual function of implementation, difficulty adapting socially, weak ability to regulate behavior for present and future goals and behavior with environmental demands. Hyperactivity is a condition that displays a lack of focus, excessive activity, and spontaneous/impulsive responses so that it interferes with the activity relations of oneself and those around (Baihaqi et al., 2006). Another opinion says hyperactivity is a medical condition due to difficulty controlling and a lack of attention span or distraction (Dayu A.P., 2013). Hyperactivity in children is a condition of attention deficit disorder that can occur due to damage to the work of the brain/nerves. In connection with this weakness, hyperactive children can learn and adapt socially like normal children, especially under 12 years old. Factors that cause hyperactivity in children that hyperactivity cannot be physically identified using X-rays or laboratories. Hyperactivity can only be assessed based on the apparent behavior in the child. There are many causes of hyperactivity that have been studied, but none of them seem to apply to existing disorders. Although some children are considered hyperactive because they tend to cause secondary emotional problems, this hyperactivity has something to do with biological factors but not emotional disorders (Baihaqi et al., 2006).

Another opinion suggests that hyperactivity called Attention Deficit Hyperactivity Disorder (ADHD) is a child who cannot sit still in his chair all day long, is always restless and quickly changes activities, and is emotionally easily disturbed so that he gets frustrated (Paternotte & Buitelaar, 2010). It is also mentioned that hyperactive children have attention deficit hyperactivity disorder (GPPH) or Attention Deficit Hyperactivity Disorder (ADHD). Based on the above opinion, it can be concluded that hyperactivity is a condition of behavior disorder characterized by high activity that is not purposeful and negative caused by neurological dysfunction. Here are some factors that cause hyperactivity disorder:

- 1) Sensory Nerve Weakness Factors, Often, there is an error in conveying messages to the brain.

- 2) Genetic Factors, It is possible that the chromosomes that inherit the trait have the potential to be passed down in families.
- 3) Prenatal Factor, prenatal factors are conditions experienced by the mother during pregnancy, such as severe physical injuries or premature birth and significant weight loss.
- 4) Neurological Factors, damage in the neurological so that orientation and memory cannot work correctly, and the use of assistive devices at birth by unskilled personnel can potentially cause child development disorders.
- 5) Biological Factors, authoritarian parenting may cause children to oppose contradictory behavior, so children are considered hyperactive.



Writing about the dominance of vision in the motion plan at the proprioception stage, that the brain determines position and motion through visual information and proprioceptive information from muscles and joints (Touzalin-Chretien et al., 2010) in the Cerebral Cortex. The threshold for perception of swinging posture is contained in information from proprioception, vestibular, and visual, which is the basis for human behavior. The brain plans a response in motion that takes information from the triangle to represent a movement with a purpose, such as running or walking (Fitzpatrick & McCloskey, 1994). Differences in organs or functions in one of the three components of motion information will affect the expression of behavior.

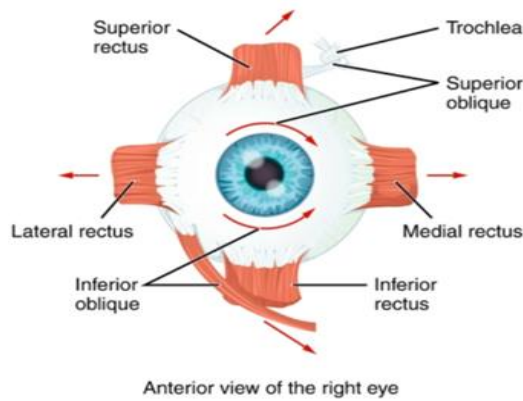
Research Method

This paper uses a literature review research method from the relevant theory and previous research, dealing with behavioral conditions in the balance relation of eye muscle movements. A literature review or literature study is a writing model that can be used in research, aiming to develop theoretical aspects as well as aspects of practical benefits.

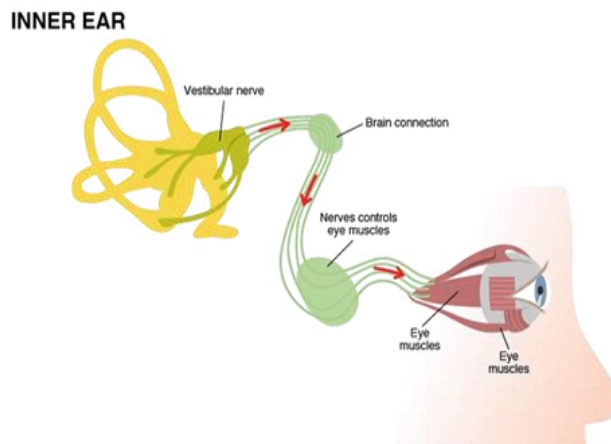
Findings and Discussion

The differences in eye muscle movements that cause the visual perception process to not reach maturity for connection with the vestibular system to produce balanced, coordinated, and aimed to maintain balance in movement that requires

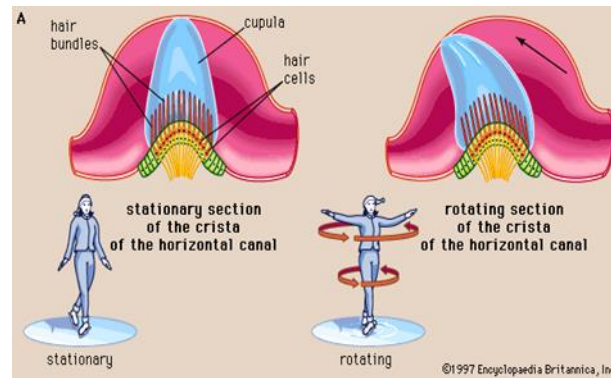
integrative work between the eye muscles and proprioceptive information received by the inner ear on the cochlear ring (Timothy, 2013). In the working conditions of the eye muscles that are different or not symmetrical between the right and left eyes, there will be a weakness in visual perception that affects the response to the child's range of motion.



Hyperactive children's behavior can be caused by differences in the information received by the sensor and processed by the brain. Loss of balance will disrupt the movement system, which means it has the potential to interfere with the display of behavior. Hyperactive children's behavior can be caused by differences in the information received by the sensor and processed by the brain. Loss of balance will disrupt the movement system, which means it has the potential to interfere with the display of behavior.



These two studies also Included information on the role of visual and vestibular functions related to muscle work in hanging joints. This triangle is the basis for behavior in humans. The brain plans response in the form of movements that make decisions to judge children without elaborating on possible causes for differences in behavior is an unwise decision and unfair to the child's development. Children at the new age of walking tend to run with a forward-leaning posture.



This posture is an effort by the brain that instructs the muscles to find balance against the gravitational force that pulls the body's weight. Accelerating the movement of motion by the body will be balanced with a forward head. The child will swing his arms back, lean forward, and rest on his toes so that the speed to move looks fast, which is called running.

This condition is called asymmetric eye movement in children with impaired eye movement due to differences in the eye muscles. When the eye is in an asymmetrical position, the visual information received will be different from the actual condition (Gelman & Terry Kit-Fong AU, 1996). An asymmetrical eyeball position can be caused by fatigue of the eyeball holder muscle, which causes symptoms, including:

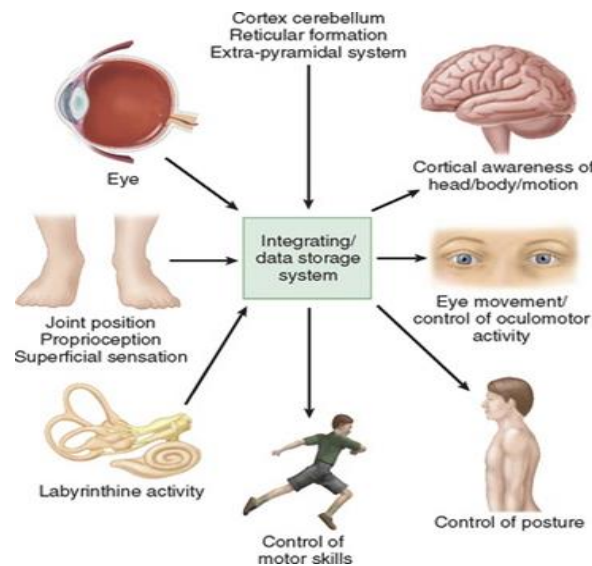
- 1) Poor coordination and instability while walking.
- 2) Difficulty concentrating, especially while reading.
- 3) Blurred or double vision.
- 4) Sensitivity to light.
- 5) Excessive anxiety, especially in crowded places.

If the child is in an unfamiliar area, the child will rely on auditory and tactile (touch, touch, pressure, temperature) to integrate with proprioception to send the news to the brain. The interrelation of the sensory system that occurs from the visual, vestibular, and proprioceptive becomes a part that requires the care of early childhood companions with undirected and purposeful movement patterns. Spatial or position information on surrounding objects is processed by the brain in the dominant relationship from visuals, even though the incoming information is from other sensor modalities (Walk & Herbert, 2018). Children without visual symmetry disorders will receive information that makes them perform better in spatial integration. At a later age, the brain and body can already build a more stable posture. In moving places with motion, the child should be able to adapt to the surrounding environment (Wade, 2001). Information obtained through the sensor system (senses and vestibular and proprioceptive) in the future is referred to as data. Data from optical/visual information for spontaneous motion turns out to be usually a repetition of classical information for spontaneous motion.

The brain's perception uses these data with the threshold of balance information used when turning and rolling movements. The brain also receives eye movements as an indicator of rotational information in the context of balance. Lee and

Lishmann's research shows that visual information is vital for controlling attitude, and visual movement stimulation can cause postural sway. Changes in motion on the vertical axis are perceived by humans from information to the brain by the visual, limb, and vestibular senses. If we see a rotating line, humans actively pursue the stimulus so that there is a shift in vision. For example, when sitting in a stationary car but the next car is moving, we feel we are moving. However, if we find children aged 3 to 4 years still moving without control, they also tend to easily hit objects around them or fall easily with little and thin obstacles, we can observe eye movements.

As a source of information for the brain in processing motion responses, if we find a child with eyeballs that move and move asymmetrically, we can conclude that the child has the potential to have non-normative behavior due to different visual inputs. For this reason, it is necessary to exercise the flexibility of the eyeballs to achieve a symmetrical eyeball position in all areas of the visual field. Proprioception is another part of the sensor along with the vestibular to measure spontaneous movement in integrating the proprioceptive and vestibular systems. The vestibular nervous system is functionally stimulated by neck rotation (Ferre & Haggard, 2016). Proprioception is another part of the sensor along with the vestibular to measure spontaneous movement in integrating the proprioceptive and vestibular systems. Functionally, the vestibular nervous system is stimulated by neck rotation.



Conclusion

From the discussion above, there are three components, namely the role of information on the visual function of the vestibular system related to the work of muscles that change the joints that form the basis of human movement. With the addition of an emotional atmosphere, the movement that appears will be known as behavior. If there is a disturbance in the work of eye muscles, there will be a change in information to the brain that is responded to, with the info mask being different from the concrete that other people see. The behavior displayed by the child becomes non-normative, such as moving too fast, often bumping into something, and even

delays in reading, which is caused by difficulty focusing the eyes to receive the alphabetic symbol information in the reading sequence. Move the eyeball to see a series of objects change from their proper alignment, potentially causing sequence jumps or read line shifts, also known as skip reading.

Educators and parents are expected not to jump to conclusions if a child is found with non-normative behavior. The disturbance may be due to differences in information and asynchronous between visual and proprioceptive system dysfunction. Exercise the eyeball with a 20-20 pattern, meaning 20 minutes of rest after 20 minutes of continuous close-up viewing and looking at a distance. The eyeball movements glancing right-left, up-down, and circularly will also help the eye muscle flexibility. In other conditions, it is necessary to consult a neuroscience practitioner, pediatrician, and ophthalmologist.

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