Movement Behavior and Gross Motor Skills of Preschool Children in East Java Urban Area

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Abstract. The purpose of this study is to identify preschool children's movement behavior and gross motor ability level in the East Tawa Urban Region. The International Physical Activity Questionnaire (IPAQ) and the Test of Gross Motor Development Second Edition (TGMD-2) were employed as instruments in the cross-sectional study. The youngsters in this study are aged 3-5 years and live in the East Java urban region. According to the findings of this study, most children in the East Java metropolitan region engage in physical activity with a range (95% CI: 45.96–54.04), while sedentary activity in front of a screen has a span of more than 1 hour each day (95% CI: 45.96–54.04). The descriptive statistical identification results for children's locomotor skills (20.19–62) and object control (25.48–66.48) were (95% CI: 45.96–54.04). It can be established that movement behavior has a major influence on children's gross motor skills.

Keywords: movement behavior, gross motor skills, preschool *age*

1 Introduction

Children engage in a variety of motions that are tailored to their age group in order to meet their growth and development needs (1). Children are defined in accordance with the WHO's 0–19 age range for children. Preschool age, which was between 3 and 5 years old at the time, was when children's physical, cognitive, and other talents all developed the quickest (2). Physical activity is defined as all regular motions that can be performed at any skill level, including walking, cycling, athletics, active recreation, and playing (1). Participate in moderate physical exercise while maintaining a healthy body weight (3,4), being in good cardiorespiratory and muscular condition (4,5), having a positive impact on cognitive elements (5), and developing fundamental motor abilities (6,7). The World Health Organization (WHO) advises children ages 3-5 to engage in at least 180 minutes of physical exercise each day, of which 60 minutes should be spent engaging in moderate-intensity activity (8). According to field data, less than half of

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preschoolers in America and Norway participate in physical activity (9,10). Age level and the sort of location where one lives also have an impact on one's degree of physical activity (11,12). According to earlier studies, the East Javan population's participation in physical activity fell short of expectations by 63.2%, which indicates that these sports' outcomes fell short of expectations. As of 2017, the obesity prevalence in East Java is still high (13). According to research findings, there is still a low level of physical activity in the metropolitan area of East Java, in part because kids are more likely to spend their leisure time watching television and engaging in other energy-conserving activities (14).

Physical exercise is crucial as a stimulus for the gradual development of the cognitive and motor abilities that shape a child's development. In order to develop the fundamental movement abilities referred to as gross motor skills, it is strongly advised to use physical activity that occurs unnaturally as the basis (10). Children's coordinated bodily movements such as crawling, sprinting, tiptoeing, jumping, hanging, throwing and catching, and keeping balance are all part of their gross motor development (15). When engaging in activities like playing, kids with high motor skills will adjust more readily and encourage kids to make friends with their classmates more quickly (16). However, the risk of motor suspects is 3.81 times higher in children between 24 and 35 months of age (17). In order for youngsters to demonstrate particular skills when they are immature, motor development also rely on muscle and nerve maturity (18). In the United States, between 12 and 14 percent of children have developmental issues, including gross motor delays; in Thailand, 24 percent; in Armenia, 22 percent; and in Indonesia, 13 to 18 percent (19). It reached 10.2% in East Java, which may cause a decline in children's adaptability and inventiveness (20). Only 46.6% of three-year-olds in an urban area of East Java had sufficient gross motor development, according to research (21). The development of gross motor skills is more pronounced during the first five years of life, which will affect later movement abilities, according to other supporting studies (22). Additionally, there is a correlation between a child's age and their gross motor development as toddlers, making it imperative to promote physical activity from a young age in order to avoid delays in children's gross motor development (17).

The significance of this research is the dissemination of information and awareness to parents about the benefits of physical activity from a young age so that it becomes a habit and reduces children's motor delays to adopt an active lifestyle that aims to improve children's physical condition, one of which is to improve preschoolers' gross motor skills in urban areas of East Java. This study will raise parents' awareness of the importance of children's physical activity needs. Additionally, it aids in lowering decline rates brought on by slowdowns in children's gross motor development. so that it can ascertain the level of gross motor development and physical activity among preschoolers in East Java's metropolitan districts.

2 Method

In this study, sedentary screen time was determined using the IPAQ questionnaire, while children's gross motor development was determined using the Test of Gross Motor Development Second Edition (TGMD-2). Preschoolers (ages 3-5) in East Java's urban regions, including Ma-lang City and Kediri City, make up the sample. A total of 26 pupils were sampled, including 15 students from the City of Malang and 11 students from the City of Kediri. A systematic random sample methodology will be used as part of the sampling protocol. obtaining each PAUD's clearance, including minors' permission to participate in research activities. Later, permission from the PAUD institution will go through the manager or other PAUD-related personnel. After consulting with PAUD managers, parents will be informed about this research program, which aims to gauge how long kids spend using gadgets and how much they can move their bodies, and will then be asked to sign a consent form as a legal requirement for conducting sampling. bivariate analysis of data, or just a straightforward correlation between two variables.

3 Results

There were 26 respondents in all for this survey, with 14 men and 12 women. The mean of the data analysis findings is 50, with an SD of 10 for both male and female respondents, as discovered here. The analysis's minimum and maximum values fall within the ranges of the locomotor, which ranges from 20.19 to 62.00, the object control, which ranges from 25.48 to 66.48, and the sedentary screen time (SST), which ranges from 32.73 to 60.23. The study's population has a normal distribution, which satisfies the requirements for analysis.

To ascertain the link between physical activity and the degree of gross motor development in preschool-aged children in metropolitan regions of East Java, a bivariate analysis was conducted. Information is provided in

Table 1. Movement Behavior and Gross Motor Skills

	N	Mean	SD	Min	Max	95% ± CI	
						Lower Bound	Upper Bound
Gross Motor Quotiens							
Locomotor	26	50	10	20.19	62.00	45.9609	54.0391
Object Control	26	50	10	25.48	66.48	45.9609	54.0391
Physical Activity							
Light	1	0	0	0	0	0	0
Moderate	12	50	10	38.65	66.22	43.6463	56.3537

Vigorous	13	50	10	36.55	66.83	43.9571	56.0429
Sedentary Screen Time (SST)	26	50	10	32.73	60.23	45.9609	54.0391
Sleep Duration	26	50	10	32.73	60.23	45.9609	54.0391
Proportion of Sedentary Screen Time (Sst) in 1 Week According to WHO Standards							
Sedentary Screen Time (SST) & WHO	26	50	10	32.73	60.23	45.9609	54.0391

Correlation			
	N	r	Sig
Physical Activity & GMQ			
Light & Object Control	1	.000	.000
Moderate & Object Control	12	.545	.067
Vigorous & Object Control	13	.075	.807
Light & Locomotor	1	.000	.000
Moderate & Locomotor	12	.579	.049
Vigorous & Locomotor	13	.267	.378
Sleep Duration & GMQ			
Sleep Duration & Object Control	26	.286	.156
Sleep Duration & Locomotor	26	.485	.012
SST & GMQ			
SST & Object Control	26	.840	.013
SST & Locomotor	26	.751	.000

Based on Table 1, it can be concluded that there is an association between sedentary behavior and the degree of gross motor development in preschool-aged children in metropolitan regions of East Java (sig. 0.05). The development of children's gross motor abilities between the ages of 3 and 5 in East Java's metropolitan regions falls into the bad category, yet some kids still have good gross motor skills. It is referred to as a poor criterion if the child has trouble following while doing the movement, and it contains a good criterion if the youngster can follow every action flawlessly and has no trouble doing so. The categories used in the TGMD data are adjusted according to the following norms: 1) very superior if the value is > 130; 2) senior if the value is 121-130; 3) above average if the value is 111-120; 4) average if the value is 90-110; 5) bellows average if the value is 80-89; 5) poor if the score is 70-79; and very poor if the value is <70. Meanwhile, the categories used in the IPAQ data (children's physical activity test) are adjusted to the following norms: 1) if >3000 MET minutes/week, then physical activity is high; 2) if >600-3000 MET minutes/week then physical activity is moderate; and 3) if <600 MET minutes/week of low physical activity.

Figure 1. Physical Activity Level Capacity

The graphic above explains that the amount of data distribution is normal. This data depicts the population distribution in terms of children's physical activity levels, which are classified as low, medium, and high. The analysis revealed that the low level of physical activity was in the range 00.00-00.00, the moderate level of physical activity was in the range 40.00-60.00, and the high level of physical activity was in the range 40.00-60.00.

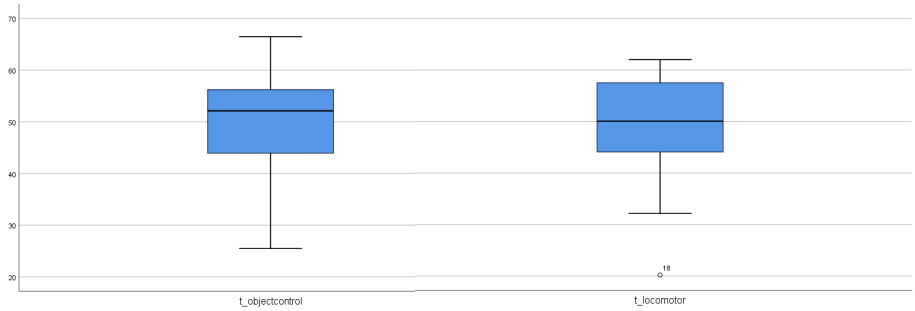

Figure 2. Gross Motor Level Capacity

The picture above shows that the level of data dispersion is in the usual range. This data depicts the population distribution in terms of the level of gross motor movement in children, which includes locomotor and object control. The analysis results suggest that locomotor skill levels are in the 40.00–60.00 range, and object control skills are in the 40.00–60.00 range.

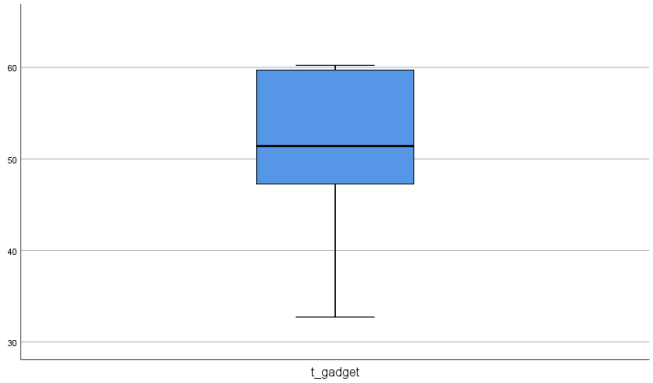

Figure 3. Sedentary Screen Time Capacity

The picture above shows that the level of data dispersion is in the usual range. This statistic depicts the population distribution in relation to the amount of sedentary activity in front of the screen. The analysis results suggest that the degree of sedentary activity in front of the screen is between 40.00 and 60.00.

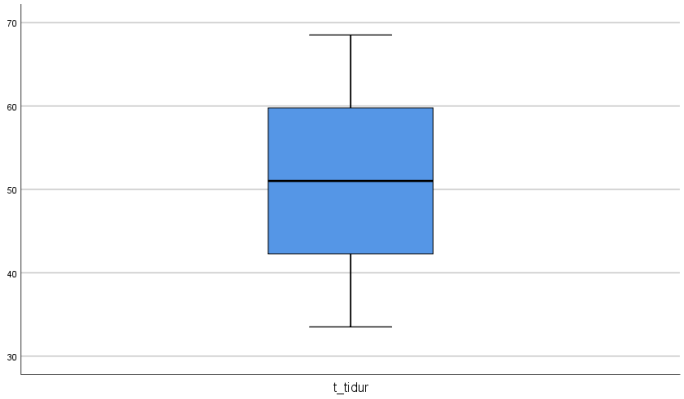

Figure 4. Sleep Duration Capacity

The picture above shows that the level of data dispersion is in the normal range. This data illustrates the population's distribution of sleep duration capacity. The analysis results suggest that the child's sleep duration capability is between 40.00 and 60.00 minutes.

4 Discussion

Children's physical activity levels can fluctuate depending on where they live (23). The expansion of the city has had a significant impact on society and children's activities, which have resulted in the creation of spontaneous play places in public spaces, which are referred to as invisible playgrounds (24). Another explanation is that the prevalence of childhood obesity in cities is higher than in rural areas, where the figure is 17%, because cities are economic hubs with low socioeconomic levels and decent health care (25,26).

Preschool is commonly referred to as the "golden age," with 80% of cognitive development completed at this age (27). Physical activity chances are highly important in early infancy to develop a good gross motor level; nevertheless, in middle and late childhood, this may impair their physical activity participation (28). Individuals will be influenced by both genetic and environmental factors in the cognitive, affective, and psychomotor contexts of children, which will make a difference (29).

Gross motor abilities are thought to be a key component of motor skills as well as children's cognitive and psychological behavior (30). Optimal development occurs between the ages of 0 and 5 years; nevertheless, there is still a delay in gross motor development between the ages of 3-5 years (49%) and 8.83% (31). Low birth weight is one of the variables influencing the delay in gross motor development in children (32). epending on the baseline level of motor coordination, the general trend to diminish in physical activity levels with time is mitigated or strengthened (33). Boys correlate favorably with object handling skills in the pre-school age group due to evolutionary and biological differences between boys and girls, particularly in skills such as throwing and hitting (34,35).

The pattern of physical activity is one of the causes of the high rate of obesity in Indonesia with a prevalence of 18.8% (14). Another study found that parenting patterns of physical activity ($p = 0.011$) and physical activity ($p = 0.004$) were risk factors for preschool children being overweight. Children with inactive physical activity are 7.66 times more likely to be overweight, whereas children with parents who do not promote physical exercise are 6.16 times more likely to be overweight. body mass index (36). According to WHO active guidelines for children aged 3-5 years, children should engage in moderate to vigorous physical activity for 180 minutes per day or 60 minutes per day (37). Small ball activities are one of the daily actions that can be employed to promote children's physical activity and gross motor skills (38). Children who participate in greater physical activity improve their motor ability and fitness (39). According to research, physical activity has a positive correlation with the composite of motor skills and coordination, and there is evidence for physical activity that correlates with object control or locomotor skill competence (40).

According to a 2019 study conducted by the University of Central Florida in Orlando, Florida, sophisticated technology makes it easier for all activities and interests

of sedentary behavior to infect not only office work but also lifestyles carried out at home, such as watching TV, playing smartphones, and playing online games for long periods of time. lengthy amounts of time (8–10 hours per day) and without enough physical activity might increase health risks ranging from small illnesses like low back pain to serious illnesses like hypertension, heart disease, and risk factors for metabolic syndrome (41–43). Sedentary activity in Southern European countries is characterized by significant country- and region-specific differences in physical activity and sedentary time, with lower levels of physical activity and prevalence estimates indicating that the counts per minute are highest at ages 4-5 years (44). Sedentary activities for children aged 3-5 years can be carried out for a maximum of 60 minutes per day, according to WHO active guidelines; the less time spent sedentary, the better (37). In 2012, the growth of gadget use in Indonesia was 120% (45). According to one study, children who use devices become difficult to interact with, don't care, and don't reply when their parents talk to them (46). Gadget addiction can have an impact on children's brain development because excessive dopamine production increases prefrontal cortex functions such as emotion control, self-control, responsibility, decision-making, and moral values, as well as the risk of attention deficit disorder and hyperactivity in pre-school-aged children (47).

Sleep duration is also known to influence health outcomes, with short sleep duration being connected with childhood and teenage overweight and obesity, as well as mental health problems. Chronic sleep deprivation up to the age of 7 years might increase obesity in later childhood and adolescence, according to WHO active guidelines for children aged 3-5 years, which is 10–13 hours, which includes naps and night sleep (37). Preschoolers had a 41.67% prevalence of sleep disruptions with usage of >2 hours, which is impacted by the kind of media, onset, and length of sleep disturbances (48). The study's results with 440 youngsters aged 3–8 collected data on sleep length for 7-9 hours (64.8%), 10–12 hours (34.3%), and 64% had a nutritional status of fat-obese (49). According to the findings of this study, children's sleep deprivation can lead to health concerns.

Improving children's gross motor development and movement behavior requires both mental and physical preparation. With full knowledge and planning, provide a proper coaching process for children and their growth and development. Provide opportunities to discover new things, introduce, accompany, and provide a stimulating environment in play that will boost the development of gross motor skills without exceeding the child's ability. Furthermore, strengthening the ability to regulate, control, and improve bodily abilities and a healthy way of life will support the evolution of a strong, healthy, and skilled body.

5 Conclusion

Because of the bivariate correlation values derived from the research team's findings, it is possible to conclude that there is a substantial association between movement behavior and gross motor skills of preschool-age children in the metropolitan area of East Java. The majority of physical activities performed by preschool-age children in East Java's metropolitan areas are moderate to vigorous. Most children spend more than one hour per day in front of a screen. The duration of children's sleep is classified as good since all youngsters utilize their sleep time in accordance with WHO criteria. Teach physical activity according to WHO criteria for PA (180 minutes/day [60 minutes of moderate-strength PA]), SST (one hour/day), and sleep (10–13 hours/day) for children under the age of five, as well as sufficient motor skills.

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