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# Improving Fundamental Movement Skills in Early Childhood through Outdoor Play Based on Gender

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## Abstract

Basic movement skill (FMS) is an important factor that can influence physical activities. Playing outside can support a child overall health, learning process, and basic motor skill development. The purpose of this study was to determine early childhood motor development through outdoor play based on gender differences. This study used an experimental method with a one-group pretest-posttest design. The study population consisted of preschool children aged 5–6 years. The sample included 30 preschool children selected using purposive sampling, consisting of 12 boys and 18 girls. TGMD -2 test instrument was used to measure FMS. The results showed that there was no difference of the effect of the outdoor play program on the basic motor skills (FMS) of boys and girls. Locomotor skills and control objects indicates that there was a significant effect of the program intervention. It concludes that early motor skills of boys and girls were improved after participating in an outdoor play program. According to the result of this study, it is necessary to conduct a more detailed approach on gender differences, especially on their basic motor needs and participations in programmed outdoor activities to encourage the development of basic motor skills (FMS).

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## INTRODUCTION

The UK physical activity (PA) guidelines recommend that preschool children should do at least 180 minutes of PA per day, with at least 60 minutes of moderate to vigorous physical activity (MVPA) (Davies et al., 2019). Similar recommendations are stated in the Canadian PA guidelines and the Australian PA guidelines (Christian et al., 2022). However, adherence rates vary across the world. Studies have found that in Australia, 93% of children met the guidelines (Cliff et al., 2017), whereas in Canada, only 62% met the recommendations when PA was assessed using accelerometers (Jones et al., 2020). In 2012, it was reported that only 32% of boys and 24% of girls aged 2–15 years met the recommended Physical Activity (PA) guidelines, namely 60 minutes of moderate to vigorous physical activity (MVPA) a day (Kobel et al., 2017). In Australia, the school environment along with school policies could influence FMS performance and increase student PA levels during recess (Apriliani et al., 2021). A study comparing the physical activity behavior of children from 15 countries found that PA behavior indicator scores were generally low (Tremblay et al., 2014).

Fundamental movement skill (FMS) is an important component in improving health and serves as building blocks for a stronger machine (Belton et al., 2014). According to (Cohen et al., 2015) and (Foweather et al., 2015), childhood FMS has a positive effect on physical activity and has fitness-enhancing properties. FMS features movement skills (running) and ball throwing (Bolger et al., 2021). Before a child starts playing different types of sports that allow for physical activity in everyday life, FMS must be taught (Reifsteck & Brooks, 2018). For preschool teachers, FMS is an effective method (Wick et al., 2017). In terms of pedagogical and theoretical considerations for instruction, practice, and intervention, there are several different FMS intervention strategies. The best pedagogical and theoretical approach to FMS is mastery intervention, also known as cognitive intervention, where a child is guided through a direct and simultaneous exploration of FMS (Bandeira et al., 2017). Childhood (3-5 years) is considered the most important period for learning and developing FMS (Martínez-Bello & Estevan, 2021).

The National Association for Early Childhood Education and the National Association for Sport and Physical Education (NASPE, 2009) (Vale et al., 2014) recognize the importance of FMS learning in the preschool years. To meet standard accreditation criteria, schools must provide opportunities for children to participate in a variety of safe and healthy motor skill activities (Wright & Stork, 2013). The majority of schools currently incorporate non-formal activities in informal settings with the requirement to earn credits. However, children who do not engage in physical activities to improve their basic motor performance (but rather only participate in activities outside the classroom) do not show improvements in their basic motor performance or motor functions (Wick et al., 2017). Thus, it is clear that physical activity and FMS have a reciprocal and dynamic relationship where physical activity at a young age may promote the development of FMS, which in turn promotes engagement in physical activity at a later age.

The goal of FMS is to replace existing gross motor programs in schools by improving motor skills of students in kindergarten (Brian et al., 2017). To have an effective impact on early childhood, FMS interventions are implemented in schools (Truelove et al., 2018). To create a strong foundation to support lifelong education, formal outdoor play during kindergarten is essential (McClintic & Petty, 2015). According to Carter (2016), a healthy physical, mental, and social growth is a key component of high-quality education. Therefore, some educational institutions promote learning through play (Rush, 2014) to provide a safe and engaging learning environment for a child motor skill development (FMS).

While research on activities for young children in outdoor spaces has shifted its focus to more structured and organized environments, outdoor play has significance as it relates to activities for young children that require more flexibility and tension to adapt and integrate with the environment and allow users to move in more dynamic motor patterns (MacQuarrie et al., 2015). Differences in learning environments are described as differences in learning activities, concreteness, external conditions, learning topics, perceived ability to concentrate, and motivational differences (Sjöblom & Svens, 2019). Outdoor environments provide multi-sensory, movement-based, holistic, and stimulating experiences that are perfect for children.

There have not been many studies revealing gen-

der differences in FMS. A study by Goodway and Barnett from 2003 found that adolescents showed greater improvements in object control compared to children. Meanwhile, according to Truelove et al. (2018), girls are more likely to benefit from object-based learning compared to boys. Other studies illustrate that age, gender, physical activity, and program are positive determinants of FMS in preschool-aged children (Iivonen & Sääkslahti, 2014). However, there has not been a conclusion according to gender differences in FMS in children. Some studies have found gender differences in FMS in children (Bolger et al., 2021; Niemistö et al., 2020), where boys having higher proficiency in object control skills than girls (Robinson et al., 2012). In contrast, boys and girls have been found to have similar locomotor skill proficiency.

Although evidence suggests that FMS and physical activity are interrelated, many preschool interventions examining outdoor play do not focus on improving physical activity or FMS (King-Dowling et al., 2020). For example, a review by Gray et al. examining factors associated with physical activity during outdoor play found that only one of 28 studies that examined motor skills (Gray et al., 2015). In addition, the effects of a year-long FMS-focused intervention on physical activity in preschoolers were studied; it was found that the intervention significantly increased physical activity compared to structured free play program (Wadsworth et al., 2017). In addition, although FMS and physical activity interventions showed different effects due to difference of sex, there have been no attempts to determine which interventions are most beneficial for girls, whose physical activity and ball skills are always lower than boys (Hnatiuk et al., 2019). Finally, it remains unclear how interventions should be tailored to benefit all children, regardless of age, gender, current physical activity, and all of which can influence physical activity outcomes (Hnatiuk et al., 2019). This information is critical, as the relationship between motor skill competence and physical activity can be influenced by individual factors, such as sex, age, and current physical activity levels (Wick et al., 2017) as well as environmental factors.

Outdoor play is important because it is associated with young child activities that require greater flexibility and excitement to adapt and integrate with the environment and allow users to move in more dynamic movement patterns (MacQuarrie et al., 2015). Differences in learning environments are described as differences in learning activities, concreteness, external conditions, learning topics, perceived concentration, and motivation (Sjöblom & Svens, 2019). In contrast, other studies have not examined differences between adolescents and children in terms of motor skills, but a study by Goodway and Barnett from 2003 found that adolescents showed greater improvements in object control when compared to children. This may indicate that girls are more likely to benefit from object-based learning compared to boys (Brian et al., 2018). This research suggests that motor skill development programs for beginners should be implemented with a gender-specific approach to help children develop more diverse motor skills. Therefore, the aim of this study was to improve fundamental movement skills (FMS) in preschool-aged children through an outdoor play program.

## METHODS

The research method used in this study was an experimental method with a pretest-posttest one group design. A National Preschool in Cimahi City participated in this experimental study. There were two preschool classes involved as research samples receiving the outdoor play program. The samples involved 30 students (12 boys and 18 girls) selected using purposive sampling. All samples participated in this study for 7 weeks. Data collection was conducted with consent from the school and parents. This program was conducted under the direct supervision of the class teacher, because it is better if an intervention is carried out directly by the teacher (Brian et al., 2017).

### Participant

In this study, purposive sampling was used to recruit 30 preschool children, consisting of 12 boys and 18 girls aged 5-6 years. The study was supervised by the school principal, teachers, and parents. A total of 4 classroom teachers participated in the study to maintain order among the children during testing. The school that became the research site was classified as a national plus school in Cimahi City with a middle to upper economy status. The majority of children went to school by a vehicle.

## Instrument

The TGMD-2 is a motor assessment tool that requires observation techniques. It is designed to assess gross motor development of children aged 3 to 10 years. The Test of Gross Motor Development 2nd edition (TGMD-2) (Ulrich, 2000) was used to evaluate the participant FMS. It is a standardized, inexpensive, and easy-to-apply test that allows the classification of FMS in terms of overall gross motor skills. The Gross Motor Quotient (GMQ) consists of two sub-tests (locomotor and object control). The first sub-test (locomotor) assesses the skills of running, sprinting, jumping, hopping, jumping (horizontal), and sliding. The second sub -test (object control) assesses the skills of hitting a stationary ball, dribbling a stationary ball, catching, kicking, throwing with the hands, and rolling with the hands. This test is used to a) identify whether children follow similar age patterns in FMS development, b) plan physical exercise programs, c) evaluate individual FMS progress, and d) serve as an assessment tool in FMS research.

TGMD-2 also has a scoring system for each expected performance criteria. There are 3–5 criteria for each FMS. A score of "1" is given for each criterion present and "0" when the criterion is not met. Three trials are offered (the first trial is done to familiarize the movement) for each FMS, allowing scores from 0 to 2 for each performance criterion. Scoring was done on the second and third trials. The maximum score of the TGMD-2 is 96 points, ranging from 0 to 48 points for each sub-test. The raw scores can be converted to percentiles and standardized scores and compared to peer ratings. The assessment can usually be completed within 20-30 minutes (Valentini, 2012).

## Procedure

The study was conducted for seven meetings in the experimental class by implementing the outdoor play program on different days. One meeting was used to conduct the pretest. The post-test was conducted after the last meeting. The time allocation for each session was 30 minutes, while the frequency of meetings was twice a week. The outdoor play program consisted of 10 games that contained locomotor, non-locomotor, and manipulative movements. The program was conducted under the supervision of the class teacher and was carried out vigorously in a fun environment to overcome TGMD-2 isolated movements. The Test of Gross Motor Skill (TGMD-2) (Johnstone et al., 2017), a valid, reliable, and affordable method to determine FMS, was used to measure FMS at the beginning and during the study. Before collecting data according to the TGMD-2 guidelines, the researchers trained the field staff. They tried to be patient and interacted with the children to ensure that they were aware and understood what was happening (Maeng et al., 2017). The intervention program is presented in Table 1.

**Table 1**. The Outdoor Play Program Intervention

| Week | Sessions | Activities | Type of Activity |
|---|---|---|---|
| 1 | | Pre-test | TGMD-2 test components |
| 2 | 1 | Hear and Imitate | Walk while imitating animal movements in line with instructions |
| | 2 | Become A Statue | Walk around the hula-hoops to the beat of the music and become a statue in the current position when the music |
| 3 | 3 | Walk in Any Direction | Walking in all directions |
| | 4 | Keep the Ball in the Air | Throwing and catching a ball in the air |
| 4 | 5 | Reach for the Stars | Walk with friends in their group while working together to collect stars |
| | 6 | Duck, Duck Goes | In a squatting position forming a circle, two students run after each other and alternate positions |
| 5 | 7 | Stuck in the Mud | Running in all directions to chase each other and rescue their friends who are stuck in the mud |
| | 8 | Circle The Road | Walk by moving the hula-hoops to his/her group of friends |
| 6 | 9 | Dribble and Grab | Walking while dribbling the ball to his/her group of friends |
| | 10 | Bounce and Grab | Walking by bouncing the ball and passing it to their group mates |
| 7 | | Post-test | TGMD-2 test components |

The TGMD-2 test was prepared according to the specifications given for the evaluation of FMS (Ulrich, 2000). When the students arrived at the testing site, the researcher ensured that all children wore appropriate clothing for the test (pants, T-shirts, and sneakers). For the test, the children were randomly divided into five groups. Each group performed the movements (FMS) in the order of the test. Each child completed the test session separately (15 minutes per student). All students completed the TGMD-2 test and no one experienced difficulties during the test. The program was implemented under the supervision of the class teacher and enthusiastically performed in a fun environment to address individual movements of the Test of Motor Skills (TGMD-2) (Johnstone et al., 2017).

The outdoor play program consisted of 10 games

covering locomotor, non-locomotor, and manipulative movements. There were two preschool classes involved as research samples receiving the outdoor play program. This outdoor play program consisted of (1) hear and imitate, (2) become a statue, (3) walk in any direction, (4) keep the ball in the air, (5) reach for the stars, (6) duck-duck goes, (7) stuck in the mud, (8) circle the road, (9) dribble and grab, and (10) bounce and grab. This intervention was provided in 10 meetings (5 weeks), which were held on Tuesdays and Thursdays during sport lessons in the school environment. The study was under the direct supervision of the class teacher, because it would be better if an intervention is conducted directly by the teachers (Brian et al., 2017). The intervention program is presented in Table 1.

### Data Analysis

This study used the IBM SPSS version 26 data analysis application. Data analysis techniques used descriptive statistics to see differences in mean and standard deviation. After that, the prerequisite test was carried out by testing the normality of the data using Kolmogorov-Smirnov and Shapiro-Wilk and the homogeneity of the data using the Levene Test. Then, the test proceeded with hypothesis testing using a paired t-test and an independent t-test.

## RESULT

All analyses were performed using SPSS 23. The significance level was set at $p \leq 0.05$. Descriptive statistics were used to present the TGMD-2 scores. Paired sample t-test was used to investigate gender differences in TGMD-2 scores. The detail is presented in Table 2 and Table 3.

Data were obtained using the TGMD-2 test, including locomotor tests and control object tests to describe the level of basic movement skills (FMS). The data were then processed through the analysis process using the SPSS application to determine the results of FMS development based on gender differences. The results of the data analysis are presented in Table 2, 3, and 4.

**Table 2.** Characteristics of The Respondents

| Gender | Frequency | (%) | Age |
|---|---|---|---|
| Boys | 12 | 40 | 5-6 |
| Girls | 18 | 60 | 5-6 |

Based on the results shown in Table 2, the age of the respondents ranged from 5 to 6 years old. The respondents consisted of 30 students, involving of 12 male students and 18 female students. The results showed that the female gender was more dominant compared to male gender.

**Table 3.** Results of the Paired Samples T-Test for Male

| Subtest | Mean | SD | t | df | Sig. |
|---|---|---|---|---|---|
| **Locomotor** | | | | | |
| Running | 3,00 | 1,27 | 8,24 | 11 | ,000 |
| Galloping | 1,33 | 0,65 | 7,09 | 11 | ,000 |
| Hooping | 1,58 | 0,51 | 10,65 | 11 | ,000 |
| Horizontal | 1,58 | 1,08 | 5,06 | 11 | ,000 |
| Leaping | 1,33 | 0,88 | 5,20 | 11 | ,000 |
| Sliding | 2,83 | 1,52 | 6,42 | 11 | ,000 |
| Catching | 1,58 | 0,66 | 8,20 | 11 | ,000 |
| **Object control** | | | | | |
| Striking a stationary ball | 0,91 | 0,99 | 3,18 | 11 | ,009 |
| Kicking | 1,75 | 1,21 | 4,98 | 11 | ,000 |
| Overhand throw | 0,91 | 0,79 | 4,00 | 11 | ,002 |
| Underhand roll | 1,91 | 0,90 | 7,37 | 11 | ,000 |
| Stationary dribble | 1,41 | 1,37 | 6,07 | 11 | ,000 |

In Table 3, the results of the data analysis for boys showed that there was a significant increase in the results of all basic movement skills. These results were shown in the locomotor skill component with a sig value of <0.05 and in the control object skill component with a sig value of <0.05.

**Table 4.** Results of the Paired Samples T-Test for Female

| Subtest | Mean | SD | t | df | Sig. |
|---|---|---|---|---|---|
| **Locomotor** | | | | | |
| Running | 1,66 | 0,59 | 11,90 | 17 | ,000 |
| Galloping | 1,88 | 0,96 | 8,31 | 17 | ,000 |
| Hooping | 0,72 | 0,66 | 4,57 | 17 | ,000 |
| Horizontal | 0,61 | 0,50 | 5,16 | 17 | ,000 |
| Leaping | 1,44 | 0,70 | 8,69 | 17 | ,000 |
| Sliding | 1,00 | 0,84 | 5,05 | 17 | ,000 |
| Catching | 1,16 | 0,85 | 5,77 | 17 | ,000 |
| **Object control** | | | | | |
| Striking a stationary ball | 0,66 | 0,90 | 3,11 | 17 | ,006 |
| Kicking | 1,38 | 1,14 | 5,14 | 17 | ,000 |
| Overhand throw | 1,05 | 0,63 | 7,00 | 17 | ,000 |
| Underhand roll | 0,44 | 0,51 | 3,68 | 17 | ,002 |
| Stationary dribble | 0,72 | 0,82 | 3,70 | 17 | ,002 |

Furthermore, in Table 4, the results of the analysis of girls showed a significant increase in the locomotor skill component with a sig value of <0.05 and the control object component sig value of 0.05, meaning that there was a significant effect. So, it concludes that the

outdoor play program intervention for 10 meetings on boys and girls had a significant effect on improving the basic motor skills (FMS) of preschool children.

Calculation of statistical descriptions in Table 3 reveals that the total locomotor skill subtest had an effect with a Sig value. 0.00 <0.005. Meanwhile, on the object control, specifically the striking a stationary ball subtest item, there was no significant effect with a Sig. 0.009 > 0.005.

Table 4 shows that there was a significant effect on the total locomotor skill subtest where the Sig value was 0.00 <0.005. However, on the object control, specifically the striking a stationary ball subtest item, there was no significant effect with a Sig. 0.006 > 0.005.

The sig value was used to answer the research objective, namely to know the effect of outdoor play program on basic motor skills (FMS) of preschool children based on gender differences. Based on gender differences on the locomotor skill subtest, there was a significant effect of the outdoor play program on both boys and girls. However, on the object control, specifically the striking a stationary ball subtest, it did not have a significant effect.

## DISCUSSION

This study revealed no differences in the effect of outdoor play programs on improving basic motor skills (FMS) of preschool age boys and girls. The increase in basic motor skills (FMS) was due to all students participating in the outdoor play program provided. The availability of school outdoors helps children move actively to develop their basic motor skills. The availability of recreational space is also considered an important factor because it allows children to develop FMS, where FMS and PA can help balance differences in a child physical activity during school hours (Webster et al., 2020). Likewise, physical education and structured exercises in children can improve FMS (Crane et al., 2015). A meta-analysis of a study concluded that at least three times of physical exercise performed by teachers per week significantly improved FMS (Van Capelle et al., 2017). A structured physical exercise could significantly improve the motor skills of children aged 4-6 years (Sutapa et al., 2021). Thus, motor skill interventions have been shown to improve a child PA behavior when participating in basic motor skill interventions (Robinson et al., 2018).

Some evidence suggests gender differences in a child movement abilities (Temple et al., 2016). This study provides new information on developing basic motor skills (FMS) by considering a child need based on gender differences. Motor skill development programs for beginners should be implemented with a gender-specific approach to help children develop more diverse motor skills.

Boys tend to be more physically active than girls and they engage in a more moderate and vigorous physical activity than girls (Dessing et al., 2013). Boys are also more likely to participate in and show a preference for sports, especially ball sports (Van Rheenen, 2012). When boys participate in invasion games, they perform more actions, such as shooting on goal and performing movement on the ball (Gutierrez & García-López, 2012). Boy and girl motor skill proficiency tends to be similar when object control skills and locomotor skills are combined to give an overall motor proficiency score (Crane et al., 2015). However, boys generally have more developed object control skills than girls (Eather et al., 2018). Findings were mixed for locomotor skill proficiency. When comparing boys and girls of the same age, locomotor skills of boys were reported to be lower than girls (Slykerman et al., 2016).

We found that boys tended to have better basic motor skills than girls. It is in line with other studies that at the age of five, boys have better motor control and agility than girls (Bardid et al., 2017; Barnett, Lai, et al., 2016; Venetsanou & Kambas, 2016), while girls have better motor control and balance. However, other studies showed that total locomotor scores tended to be higher in girls than boys (Bardid et al., 2017). In addition, gender differences were found in object control skills, where boys were better than girls at hitting, kicking, rolling, and dribbling. The results of this study are in line with another study using TGMD-2 and accelerometers to measure FMS and physical activity in kindergarten that found a positive relationship between object control skills and related physical activity (Crane et al., 2015). Consistent with previous research, boys had higher abilities in object control than girls (Brian et al., 2017). This may occur as a result of the child innate traits. As revealed in previous research, boys were more successful at hitting than girls; this ability is an innate trait that is biologically determined and difficult to in-

fluence through parenting (Butterfield et al., 2012).

Our results showed a significant improvement in girl abilities in locomotor skills and object control skills. In this case, girls outperformed boys in galloping and leaping skills. These skills may be influenced by girl habits of playing rope jumping. As previously reported (Pienaar et al., 2016), girls were better than boys in rope jumping, balance, and single-leg jumping because rope jumping uses only one leg. The increase can be explained by practical stereotypes in the home and school environment that support movement and play practices that encourage the development of specific movement skills. Similarly, in the overhand throw object control movement component, girls outperformed boys. Girl engagement in physical activity has been shown to provide benefits over boys in FMS needs (Webster et al., 2019).

We thus conclude that there are no gender-based differences in locomotor and object control skills in organized outdoor play program participation. The higher level of object control skill proficiency among boys is consistent with most research on young children (Yu et al., 2016). The differences in improvement in boy and girl locomotor and object control skills were not noticeably different. Although previous research suggests that boys are more likely to participate in sports and ball sports in particular (Van Rheenen, 2012), the findings of this study suggest that there was no difference in participation in outdoor play programs provided. Skill proficiency might be the result of the child participation in intervention programs. These programs had been shown to predict pre-school child basic motor skills (FMS) proficiency scores. This relationship requires further exploration with a more detailed examination on the motor development opportunities provided by different types of activities. Understanding the contribution of out-of-classroom (playground) availability is important for improving a child basic motor skill development.

Based on the results, this study acknowledges the existence of gender differences in the effect of outdoor play programs on preschool child basic motor skills (FMS). This result provides a new perspective and illustrates that outdoor activities programmed according to the motor development needs of preschool children have a significant impact. Thus, this study also supports the results of a cross-sectional study conducted in Japan, which showed that children under the age of five were significantly more likely to experience control problems, including hitting, kicking, and throwing (Kim & Lee, 2016). The findings in the study indicated that the outdoor play program had no significant effect on the object control ability such as hitting a ball in both boys and girls. A similar study found that compared to girls, boys tended to master throwing, balancing, and kicking movements (Bryant et al., 2014).

This study found that boys outperformed girls in gross motor movement skills. According to previous studies, it was found that at the age of five, boys had better motor control and dexterity than girls (Bardid et al., 2017; Barnett, Stodden, et al., 2016; Venetsanou & Kambas, 2016), while girls had better motor control and balance. Another study using TGMD-2 and accelerometers measured FMS and physical activity in kindergarten and found a positive relationship between object control skills and related physical activity (Crane et al., 2015). According to a Norwegian study, children aged 3-4 years with siblings were more likely to engage in the recommended 60 minutes per day of physical activity than children with peers (Andersen et al., 2017). Therefore, child-tailored movement levels promote the development of boys and girls towards sustainable movement.

This study found that boy total locomotor scores were higher than girl scores. Meanwhile, another research on preschoolers found that total locomotor scores tended to be higher in girls than boys (LeGear et al., 2012). This study also showed that boys had more developed object control skills than girls, except in the hitting the target ball where the difference was not significant between boys and girls. This might be because the outdoor play program intervention provided was less focused on object control skills, specifically in hitting the ball with the target, as the outdoor play program intervention is less varied in providing target ball hitting exercises. However, this can also occur as a result of the innate nature of children. As revealed in previous research, boys were more successful at hitting than girls; this ability is an innate trait that is biologically determined and difficult to influence through parenting (Butterfield et al., 2012).

Gender differences in play choices have different impacts. Girls are more likely to play dolls, furniture, household, and other games, while boys are more likely

to play sports (Weisgram et al., 2014). Similarly, the findings of this study illustrated that girls outperformed boys in locomotor movements. This is in line with previous research which revealed that girls outperformed boys in fine motor skills and boys outperformed girls in gross motor skills, such as catching and dribbling (Morley et al., 2015). From our findings, it is also clear that more explanation needs to be given on how to characterize child motor skills in terms of their daily play activities. Young children may not participate in enough volume or intensity of activities to significantly improve their motor skills (Temple et al., 2016). Therefore, young children need to be provided with activities to improve coordination, stability, and object control in infancy, toddlerhood, childhood, and adolescence.

Children learn gender roles through socialization and guidance from family, peers, teachers, and coaches to participate in activities that conform to existing gender norms. Therefore, a more likely explanation for the gender differences in this study is that family, play, and school environments should support more activity time to improve child basic motor skills. The gender-related results obtained from the Belgian sample are consistent with the results from the TGMD-2 normative sample, using item control norms in favor of children and parents. As previously reported (Pienaar et al., 2016), the study showed that girls were better than boys in jumping rope, balance, and single-leg jumping because jumping rope uses one leg. Such improvements can be explained by practical stereotypes in both home and school environments that favor movement and play practices that encourage the development of specific movement skills.

This study examined the influence of outdoor play on the growth of motor skills (FMS). Previous studies have shown that the availability of recreational space at home and outside is also considered an important factor, because it allows children to develop FMS and FMS and PA can help balance differences in a child physical activity during school hours (Wadsworth et al., 2020). The 10-month non-play intervention program was effective in causing changes in FMS of school-aged children when they played outside the classroom. As stated in a previous study, 12 weeks of physical exercise significantly improved the motor skills of 4-6-year-old children (Sutapa et al., 2021). A number of studies have shown the benefits of FMS in children, but only one study has shown that physical education and structured sports improve FMS in children (Crane et al., 2015). A meta-analysis concluded that at least three physical exercises performed by teachers per week significantly improved FMS (Van Capelle et al., 2017). Differences in preschooler motor skills can be addressed with a movement environment that emphasizes motor skill development and encourages participations in movements.

Overall, this study provides new information about how outside play programs benefit all preschoolers. The relationship between gender and FMS may help preschools and parents to identify which skills to target, so that boys and girls are given the opportunity to learn and practice basic skills before starting primary school. This study also has limitations. This study did not include weight as one of the BMI categories and did not recruit participants who were more equal in each category. This can be addressed in the future research. It is also important to identify and test the skills that boys and girls need to increase their participation in physical activity and to promote positive psychosocial and health outcomes as they grow and develop. In this study, assessors were limited to the use of the TGMD-2 test. Future research may benefit from examining participation by using a more open-ended and inductive approach to generate propositions and new theories about the relationship between physical activity and motor skills.

## CONCLUSION

Overall, this study provides new information on how outdoor play programs can benefit all preschool children. Our results clearly showed that there was no difference in gross motor skills between boys and girls and there was an association between participation in outdoor play programs and the development of gross motor skills (FMS). The result of the study suggests that a study using a more gender-specific approach on basic motor needs and participations in programmed outdoor physical activities to promote the development of basic motor skills (FMS) is necessary. Outdoor play programs in preschool children have a significant effect on locomotor movements, including in running, galloping, hooping, horizontal jump, leaping, sliding, and catching, for boys and girls. The object control movements, namely kicking, overhand throw, underhand roll,

and stationary dribble, also gained a significant effect. However, in the striking a stationary ball movement, there was no significant effect on both boys and girls. This study recommends that classroom teachers create quality outdoor play experiences to develop fundamental motor skills (FMS).

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