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A Comparative Study of Futsal Training Techniques on Concentration and Gross Motor Skills in New and Long-Term Students at MR Futsal Academy (Aged 4–7 Years)

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Abstract

This study aims to compare the effects of futsal training techniques on concentration and gross motor skills among early childhood students at MR Futsal Academy (ages 4–7). Using a quantitative comparative method, data were collected through observation and interviews with coaches and academy management. The research compared the abilities of new students and long-term students in terms of basic futsal techniques, concentration, and gross motor skills. The results showed that long-term students had significantly better gross motor abilities than new students, indicating a strong contribution of structured futsal training to physical coordination. However, no statistically significant difference was found in concentration, although descriptive data showed a positive trend. The correlation between futsal skills and both concentration and motor skills was positive but not statistically strong. These findings suggest that gross motor development benefits directly from physical training, while cognitive and psychological factors beyond the training environment may influence concentration.

Keywords: Futsal Training Techniques, Gross Motor Skills, Concentration, Early Childhood, Comparative Study

1. Introduction

Early childhood, particularly the ages between 4 and 7, is often referred to as the golden period of human development, marked by rapid cognitive, physical, and emotional growth. At this stage, children experience significant maturation in their sensory-motor systems, making it a crucial window for structured interventions that can enhance their developmental trajectory (Santrock, 2022). Two essential domains that evolve during this period are concentration, which supports children's ability to stay focused and follow instructions, and gross motor skills, which encompass fundamental physical abilities such as walking, running, jumping, and balancing. According to Darmawati, Maulina, and Susilawati (2024), structured physical activities play a critical role in improving children's coordination, balance, and agility during this stage of development.

According to Anggraeni, Karyanto, & Wicaksono (2018), traditional play, such as jump rope

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games, significantly enhances children's gross motor coordination and balance through rhythmic movement and repetitive practice. These activities foster both physical competence and attentional engagement—core elements of concentration and motor development in early childhood.

In recent years, sports-based educational programs have gained recognition as effective interventions for promoting holistic development in children. One such sport is futsal, a modified form of indoor football, which integrates a variety of physical movements and cognitive demands. Futsal training incorporates basic techniques such as passing, ball control, dribbling, and shooting, all of which require coordination, agility, and decision-making skills. These exercises not only stimulate gross motor development but also encourage attentional focus through repetitive, goal-oriented activities (FIFA, 2021).

The MR Futsal Academy in Bandung implements a structured training curriculum tailored for children aged 4–7 years. The program includes repeated exposure to futsal fundamentals through both individual and group-based drills. Preliminary observations from the academy revealed that children who had undergone longer periods of training tended to show better coordination and attention span during sessions. These findings suggest a potential relationship between training duration and the development of motor and cognitive skills.

Despite these practical observations, empirical research comparing new and long-term students within the same program remains limited. Understanding whether the length of exposure to futsal training influences concentration and gross motor development is essential for optimizing early sports education strategies. Moreover, such research can inform parents, educators, and coaches about the potential benefits of structured physical training in early childhood education settings.

This study employs a quantitative comparative method to examine differences in concentration and gross motor abilities between new and senior students at MR Futsal Academy. It also investigates whether technical proficiency in futsal is positively associated with developmental outcomes. The results of this study are expected to contribute to the body of literature that emphasizes the role of sport-based interventions in early childhood development, while also offering practical implications for futsal-based education models.

2. Literature Review

2.1 Concentration in Early Childhood

Concentration is a child's ability to focus attention on a particular task while ignoring external distractions. In the context of sports, it is essential for performance, as it enables athletes to maintain focus during high-pressure or rapidly changing scenarios. Weinberg and Gould (2014) explain that in athletic contexts, concentration includes the ability to recover attention after distraction and to remain focused on relevant stimuli throughout practice or competition.

Children between the ages of four and seven experience rapid development in concentration abilities. According to the Brain Balance Center (2015), attention spans in this age group typically range from 8 to 21 minutes depending on age and interest. This developmental stage is highly sensitive to environmental factors and the structure of activities. Anggraini, Karyanto, and Khairati (2018) found that traditional rope-jumping games significantly enhance both focus and gross motor coordination in children aged 5–6. Their study highlights that engaging, rhythmic activities improve children's ability to sustain attention while simultaneously

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stimulating large muscle movement, suggesting a close relationship between physical play and cognitive engagement.

Internal factors such as motivation and emotional condition, and external factors such as the teaching method and physical environment, all contribute to a child's level of concentration. Reinforcement strategies from instructors, as suggested by Skinner's theory (1953), play a role in sustaining children's engagement and focus throughout activities.

2.2 Gross Motor Skills in Early Childhood

Gross motor skills refer to a child's ability to use large muscle groups to perform physical activities such as walking, running, jumping, and throwing. These skills are essential for physical independence and development, particularly in early childhood. Santrock (2022) emphasizes that gross motor development supports children's interaction with their environment and peers, which also enhances confidence and emotional growth.

Darmawati, Maulina, and Susilawati (2024) emphasize that the development of gross motor skills in early childhood is influenced by structured movement and song-based activities, which significantly enhance coordination, balance, and agility in children aged 5–6. These findings support guidelines from Permendikbud No. 137 (2014), which outline stable walking, controlled jumping, accurate throwing and catching, and sustained balance as key indicators of motor competence.

Sujiono (2015) and Farida (2016) explain that a child's motor performance is shaped by both internal and external factors. Internally, maturation, gender, and health status play major roles. Externally, stimulation, environmental support, and activity-based experiences shape a child's physical competence.

2.3 Futsal Training Techniques

Futsal is a high-intensity indoor sport involving coordination, tactical thinking, and rapid physical responses. At MR Futsal Academy, training emphasizes the development of passing, dribbling, shooting, and ball control. Each of these techniques requires both physical skill and cognitive focus, making futsal a potential avenue for supporting both gross motor development and concentration in young children.

Ramdan and Lubis (2023) explain that effective interpersonal communication between coaches and students enhances understanding and motivation in training environments. MR Futsal Academy integrates communication strategies, age-appropriate drills, and consistent feedback to guide children toward steady developmental improvement.

Futsal training also incorporates physical conditioning and simulated match play, which demand high levels of balance, agility, and decision-making. Repetitive exposure to these activities is expected to stimulate the development of both the cognitive and physical domains in children.

2.4 Differences Between New and Long-Term Students

In the context of MR Futsal Academy, long-term students (enrolled for one year or more) and new students (enrolled less than one semester) display different developmental profiles. Long-term students tend to have higher concentration and motor skill levels, attributed to their consistent exposure to structured training routines. They are more familiar with coaching styles, training drills, and peer interaction, which allows them to engage more efficiently in both

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physical and cognitive tasks.

New students, on the other hand, are often still adapting to the training environment. Their focus may waver more easily, and their coordination may be less refined. These differences are not only observed anecdotally but also provide a rationale for investigating whether training experience has a measurable effect on concentration and gross motor development.

2.5 Previous Studies

A number of previous studies have explored the relationship between physical activity and developmental outcomes in early childhood. These studies serve as a foundation for the present research and help illustrate the gaps that this study aims to address.

Table 1. Summary of Relevant Previous Studies

No	Authors	Title	Key Findings	Relevance to Current Study
1	Asmuddin, Salwiah, & Arwih (2020)	Gross Motor Development in South Buton Kindergarten	Motor activities improve coordination, balance, and motor maturity in preschoolers.	Supports structured physical training as beneficial for motor development.
2	Setyawan, Hadi, & Royana (2018)	Motor Skills of Children Aged 5–6	Early childhood education improves motor coordination and agility.	Relevant for establishing a benchmark of physical development through structured environments.
3	Djuanda & Agustiani (2024)	Gross Motor Skill Development through Creative Dance Activities in Children Aged 5–6	Creative dance improved coordination, agility, and balance in early childhood motor skills.	Supports the use of structured movement-based activities for enhancing gross motor skills.
4	Ekanesia, Akbar, & Sastri (2024)	Profile of perceived social support and its relationship with adolescent mental health in Makassar City	Identified three latent profiles of perceived social support (High, Moderate, Low) among adolescents, each showing different correlations with mental health indicators such as emotional symptoms and psychological well-being.	Highlights the importance of psychosocial support structures in youth development, which complements the understanding of non-physical factors (like mental focus and concentration) relevant to training effectiveness.
5	Nuradina et al. (2023)	Personality Traits and Organizational Climate	Personal characteristics affect individual response to structured systems.	Supports variability in child responses even under the same training.

These studies confirm the importance of structured intervention in motor development and focus but reveal a research gap regarding the comparative impact of training experience on these outcomes in the same environment.

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2.6 Conceptual Framework and Hypothesis

This study assumes that structured futsal training has the potential to enhance both concentration and gross motor skills in early childhood. Each futsal technique engages physical and mental processes simultaneously. Passing demands decision-making and direction control. Ball control emphasizes timing and coordination. Dribbling requires rhythm and bilateral control, while shooting emphasizes accuracy, balance, and physical strength.

Children with more prolonged exposure to these techniques are more likely to demonstrate advanced development in both motor and cognitive domains. This framework also assumes that training experience makes a significant contribution to the differences observed between new and long-term students in both areas.

Based on the literature and conceptual framework, this study proposes the following hypotheses:

1. There is a significant difference in concentration between new and long-term students at MR Futsal Academy.
2. There is a significant difference in gross motor skills between both groups.

3. Research Method

This study employs a quantitative comparative method to examine the effect of futsal training techniques on concentration and gross motor skills in children aged 4–7 years. Quantitative methods are based on positivist philosophy, where data are collected using research instruments and analyzed statistically to test pre-established hypotheses (Sugiyono, 2017). Comparative research compares one or more variables between two different groups. In this study, the comparison involves new and senior students at MR Futsal Academy.

3.1 Operational Definitions of Variables

This research involves one independent variable and two dependent variables.

Table 2. Operational Variables

Variable	Conceptual Definition	Operational Definition
Futsal Training Techniques (X)	A series of basic futsal skills including passing, ball control, dribbling, and shooting.	Structured training sessions tailored for children aged 4–7 years, focusing on observed mastery of fundamental techniques.
Concentration (Y1)	A child's ability to focus attention on specific activities during futsal training.	Measured via visual focus tests and observational indicators during futsal training sessions.
Gross Motor Skills (Y2)	A child's ability to perform large muscle group movements (run, jump, kick, etc.).	Measured through direct observation during exercises involving coordination, balance, and physical execution of tasks.

3.2 Indicators of Variables

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Table 3. Indicators of Variables

Variable	Indicators
Futsal Training Techniques	• Accurate and balanced passing • Controlled ball receiving • Close dribbling with proper foot- Targeted shooting using instep
Concentration	• Focus on coach instructions • Complete drills without distraction • Regain attention after interruption • Wait turn calmly • Follow technique sequence
Gross Motor Skills	• Stable walking/running • Balanced jumping • Controlled throwing and catching • Kicking with direction • Obstacle avoidance and movement chaining

3.3 Population and Sample

The population of this study consisted of 168 registered students at MR Futsal Academy. From this population, 30 students aged 4 to 7 years were selected as the research sample. These participants were divided into two equal groups: 15 students who had recently joined the academy (new students), and 15 students who had been enrolled for a longer period (long-term students). The selection was carried out using purposive sampling. This technique was chosen to ensure that the selected participants met two primary criteria: they fell within the target age range and represented the contrasting durations of futsal training exposure required for comparison.

3.4 Data Collection Techniques

The research employed two primary data collection techniques. First, structured observation was used to evaluate each participant's performance during regular training sessions. Observations focused on three main components: the execution of basic futsal techniques, signs of concentration, and indicators of gross motor coordination. Second, structured interviews were conducted with coaches and academy staff. These interviews aimed to validate the observational data and to gather additional insights regarding the students' progress, training history, and behavioral characteristics during practice.

3.5 Data Analysis Techniques

The collected data were analyzed using both descriptive and inferential statistical methods. Descriptive statistics—such as mean, median, standard deviation, and frequency distribution—were used to provide a general overview of each group's performance. For inferential analysis, several tests were applied. The Shapiro-Wilk test was used to examine the normality of data distribution, given the small sample size ($n < 50$). Levene's Test was employed to test homogeneity of variance between groups. Depending on the assumption results, either the Independent T-Test or the Mann-Whitney U Test was used to determine whether there were statistically significant differences between new and long-term students in terms of futsal

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techniques, concentration, and gross motor skills.

Table 4. Summary of Data Analysis Techniques

Type of Analysis	Technique Used	Purpose
Descriptive	Mean, Median, SD, Frequency	To describe overall data distribution and central tendencies
Normality	Shapiro-Wilk Test	To test whether data are normally distributed
Homogeneity	Levene's Test	To test whether data variance is equal across groups
Difference Test	Independent T-Test / Mann-Whitney U	To compare concentration and motor skills between new and senior groups

4. Findings and Discussions

4.1 Research Context

This study was conducted at MR Futsal Academy, located in Bandung, Indonesia, which provides structured futsal training for children aged 4–7 years. The purpose of the research was to compare the concentration and gross motor skills of long-term students who had been training for over a year with those of new students who had recently joined. The total number of participants was 62 students, consisting of 41 long-term and 21 new students.

4.2 Descriptive Analysis of Variables

The descriptive statistical analysis was conducted to provide a general overview of students' performance across the three main variables: futsal technique, concentration, and gross motor skills. The results showed that long-term students consistently scored higher on all variables.

As presented in Table 1, the average score for futsal technique among long-term students was 36.93, while new students scored an average of 31.60. In gross motor skills, long-term students had a mean of 35.93, while new students averaged 32.73. In terms of concentration, the scores were relatively similar, with long-term students scoring 34.27 and new students scoring 33.80.

Table 5. Descriptive Statistics of Research Variables

Variable	Group	Mean	Median	Min	Max	Std. Dev
Futsal Technique	Long-term	36.93	37.00	35	39	1.58
	New	31.60	32.00	30	34	1.43
Concentration	Long-term	34.27	34.00	32	37	1.38
	New	33.80	34.00	31	36	1.42
Gross Motor Skills	Long-term	35.93	36.00	34	38	1.24
	New	32.73	33.00	30	35	

4.3 Instrument Reliability and Inferential Analysis

The instrument reliability was confirmed using Cronbach's Alpha, and all variables demonstrated high internal consistency, as shown in Table 2. This confirms that the tools used to assess futsal technique, concentration, and gross motor skills were reliable and appropriate for this study.

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Table 6. Reliability Test Results (Cronbach's Alpha)

Variable	Number of Items	Cronbach's Alpha	Interpretation
Futsal Technique	10	0.802	High Reliability
Concentration	10	0.791	High Reliability
Gross Motor Skills	10	0.818	High Reliability

To test for differences between groups, the Mann-Whitney U test was used due to non-normal distribution in the data. As seen in Table 3, significant differences were found in futsal technique and gross motor skills, with p-values below 0.05. However, concentration did not show a statistically significant difference between the two groups.

Table 7. Mann-Whitney U Test Results

Variable	U-Value	Z-Score	Sig. (2-tailed)	Interpretation
Futsal Technique	0.000	-6.179	0.000	Significant Difference
Concentration	85.000	-0.696	0.487	Not Significant
Gross Motor Skills	3.000	-5.624	0.000	Significant Difference

The Spearman correlation test was also applied to determine the relationship between futsal technique and the two dependent variables. The results in Table 4 show a weak positive correlation between futsal technique and both concentration and gross motor skills, although these correlations were not statistically significant.

Table 8. Spearman Rank Correlation Results

Variable Pair	Correlation Coefficient	Sig. (2-tailed)	Interpretation
Futsal Technique – Concentration	0.245	0.054	Positive, Not Significant
Futsal Technique – Gross Motor	0.317	0.065	Positive, Not Significant

4.4 Classification of Student Abilities

Further analysis was conducted to classify students' performance based on developmental levels. The classification helped to interpret whether the differences in scores aligned with qualitative observations during training.

For futsal technique, the majority of long-term students were categorized as "Advanced." These students showed consistent control over passing, ball control, and shooting. A few were placed in the "Moderate" category, but none were in the "Developing" group. Conversely, most new students were classified as either "Moderate" or "Developing," indicating they were still adapting to basic technical movements and required more repetition to build competence.

In gross motor skills, long-term students were generally in the "Mature" category, indicating developed coordination, balance, and strength in executing large muscle movements. New students showed more variability and were mostly classified as "Moderate" or "Developing." They often struggled with stability during running and jumping tasks and showed less confidence in physical coordination.

Interestingly, the classification for concentration was more evenly distributed. While some

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long-term students fell into the "High" category—demonstrating the ability to maintain focus throughout the session—a significant portion of both long-term and new students were in the "Moderate" category. A few from each group also showed low levels of attention span and required repeated prompts, suggesting that attention might be influenced by external variables such as emotional readiness or interest in the activity rather than training duration alone.

4.5 Interpretation of Results

The findings of this study support the hypothesis that structured futsal training contributes significantly to the development of gross motor skills and futsal technique in young children. The results indicate that long-term training is associated with improved control, strength, and physical coordination. This aligns with existing literature suggesting that repetitive, structured physical activity enhances large muscle movement proficiency during early childhood.

However, the difference in concentration between new and long-term students was not statistically significant. This may be explained by a range of uncontrolled factors such as intrinsic motivation, personality traits, cognitive development levels, or even environmental distractions. The balanced distribution of concentration levels across groups supports the notion that psychological and cognitive development is multifactorial and may not rely solely on physical training routines.

Overall, this study confirms the effectiveness of sustained futsal training in enhancing physical development, while also opening questions for future research on the complex nature of cognitive focus in early childhood sports education.

5. Conclusion

This study examined the differences and relationships between futsal basic techniques and the development of concentration and gross motor skills among 4–7-year-old students at MR Futsal Academy. The results showed that long-term participants (senior students) had a significantly higher mastery of basic futsal techniques than new students, suggesting that extended involvement in structured training contributes positively to technical skill development.

While no significant differences in concentration were found between the two groups, descriptive data indicated a positive tendency among new students. This may stem from their intrinsic motivation and excitement at the beginning of training. However, the relationship between basic futsal skills and concentration was weak, possibly influenced by unmeasured variables such as intelligence, psychological condition, and individual interest. These findings align with previous studies emphasizing the role of emotional and environmental factors. Pratidina et al. (2023) highlighted how perceived social support affects mental well-being, while Nuradina et al. (2023) underlined the importance of personal characteristics in shaping perception and responsivenessboth of which can influence how children focus and react to training. Ramdan & Lubis (2023) also showed that effective interpersonal communication significantly impacts learning engagement, which is especially relevant when coaching young children. Similarly, Ekanesia et al. (2023) emphasized the role of comfort, motivation, and environmental support in sustaining attention, reinforcing the idea that children's concentration depends on more than just technical exposure.

The most prominent result of this research was the significant difference in gross motor skills, with senior students showing better balance, coordination, and strength. Although the statistical relationship between futsal skills and gross motor development was not significant, it showed

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a positive trend supporting the assumption that futsal can enhance physical development in early childhood. This is consistent with findings from Fahrunisa et al. (2024), who stressed the importance of discipline and communication in improving physical performance principles also applicable to coaching young learners.

These results suggest that training programs for children should go beyond physical and technical dimensions to consider psychological, motivational, and environmental factors. Future research is encouraged to measure these internal aspects such as interest, cognitive ability, and intrinsic motivation using standardized psychological instruments, and to involve larger, more homogeneous samples for broader generalizability. Through such approaches, we can deepen our understanding of how structured physical training, like futsal, can holistically support early childhood development.

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