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The role of motor education in enhancing communication skills among kindergarten children (a comparative study)

دور التربية الحركية في تعزيز مهارات التواصل لدى أطفال الروضة (دراسة مقارنة)

Mihoubi Mourad [1]

[1] Université de Biskra (Algérie), **mourad.mihoubi@univ-biskra.dz**

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Abstract

This study examines how motor education activities influence communication skills development in kindergarten children. Using a comparative approach with random sample (cluster) of (242) children ranges of 242 children aged 3 to 5 years, communication skills were assessed using the Communication Skills Scale (Abdel-Ghani, 2013), tailored for the context. Findings indicate significantly higher communication skills, including verbal, non-verbal, and social aspects, among children engaged in motor education activities compared to non-practicing peers. The study highlights the importance of integrating motor education activities into kindergarten curricula for comprehensive skill development.

Keywords: communication skills - kindergarten child - motor education.

الملخص

كان الغرض من الدراسة التعرف على دور ممارسة انشطة التربية الحركية في تعزيز مهارات التواصل بالنسبة لطفل الروضة من خلال دراسة الفروق بين مجموعتين من الاطفال تمارس الاولى انشطة التربية الحركية برياض الاطفال في حين لا تمارس المجموعة الثانية هذا النوع من النشاط، تم الاعتماد على المنهج المقارن، وعينة عشوائية (عنقودية) من (242) طفل تتراوح اعمارهم بين (3-5) سنوات، ولغرض جمع البيانات تم استخدام مقياس مهارات التواصل (عبد الغني، 2013)، تم تكييفه حتى يتناسب مع خصائص العينة والبيئة المحلية، اظهرت النتائج درجة متوسطة لمهارات التواصل بالنسبة لمجموعة الاطفال التي تمارس انشطة التربية الحركية في حين كانت الدرجة منخفضة بالنسبة للمجموعة الغير ممارسة، كما اشارت النتائج ايضا الى وجود فروق ذات دلالة احصائية في مهارات التواصل (اللفظي – غير لفظي - الاجتماعي) بين المجموعتين لصالح المجموعة الممارسة لأنشطة التربية الحركية، كما واوصى الباحث بضرورة تعميم ممارسة انشطة التربية الحركية وتوفير جميع الظروف المناسبة لذلك بالنسبة لكافة رياض الاطفال.

- **الكلمات المفتاحية :** مهارات التواصل- طفل الروضة- التربية الحركية.

Corresponding author: Mihoubi Mourad , e-mail: mourad.mihoubi@univ-biskra.dz

I) Theoretical chapter

1. Introduction and problematic of the study

a) Introduction

Early childhood is a crucial period for the development of foundational skills that shape a child's future academic and social success. Among these foundational skills, communication -both verbal and nonverbal- is essential for effective learning, social interactions, and emotional expression. As educators and researchers seek to enhance early childhood education, there is growing interest in the role of motor education as a multifaceted approach to promoting comprehensive developmental outcomes.

Motor education, encompassing activities such as physical exercises, group games, and interactive tasks, has traditionally been associated with physical health benefits. However, emerging research highlights its significant impact on cognitive and communication skills. Engaging in motor activities can stimulate brain regions responsible for language development and social interaction, fostering both verbal and nonverbal communication abilities. The interconnectedness of motor skills and cognitive functions suggests that physical activity can be a powerful tool in early childhood education.

This comparative study aims to explore the role of motor education in enhancing communication skills among kindergarten children. By examining the differences in communication abilities between children who participate in motor activities and those who do not, we seek to understand the extent to which motor education influences verbal, nonverbal, and social communication skills. This research is grounded in theories of cognitive and social development, such as Vygotsky's social development theory, which emphasizes the importance of social interaction in cognitive growth, including language acquisition.

Through this study, we aim to contribute to the growing body of evidence supporting the integration of motor education into early childhood curricula. Our findings will provide insights into how structured physical activities can enhance communication skills, advocating for a holistic educational approach that promotes both physical and cognitive growth. By highlighting the benefits of motor education, we hope to inform curriculum design, educational policies, and parental practices, ultimately supporting the overall development of young children and preparing them for future academic and social success..

b) Problematic:

Despite the growing evidence of the benefits of motor education, there remains a significant gap in understanding its specific impact on the communication skills of kindergarten children. This study aims to fill this gap by comparing the verbal, nonverbal, and social communication skills between two groups of children: those who regularly participate in motor activities and those who do not. Numerous researchers have explored the links between physical activity and the cognitive and social development of children. For example, Diamond (2000) showed that motor activities can stimulate the development of executive brain functions, which are crucial for behavior regulation and language mastery. According to Stodden et al. (2008), there is a positive relationship between motor skill proficiency and academic achievement levels, including language skills, suggesting that physically active children who develop good motor skills tend to perform better in cognitive tasks. Additionally, Vygotsky (1978) emphasized the importance of social interactions in cognitive development, explaining that motor activities, often involving group play and social interactions, can provide natural contexts for developing verbal and non-verbal communication. By examining the impact of motor education on the communication skills of kindergarten children, this study aims to provide

concrete evidence of the importance of integrating motor activities into early childhood education programs. The results could potentially inform educators and policymakers about the best practices to foster comprehensive and balanced development in young children.

Therefore, we raised the following question: Are there statistically significant differences in the average scores of communication skills between children who practice and do not practice motor education activities in kindergarten?

A number of sub-questions emerge from this question, as follows:

-Are there statistically significant differences in the average scores of verbal communication between children who practice and do not practice motor education activities in kindergarten?

-Are there statistically significant differences in the average scores of non-verbal communication between children who practice and do not practice motor activity in kindergarten?

- Are there statistically significant differences in the average scores of social communication between children who practice and do not practice motor education activities in kindergarten?

c) Hypotheses:

- General hypothesis

- There are statistically significant differences in the average scores of communication skills between children who practice and do not practice motor education activities in kindergarten in favor of the children who practice.

- Sub-hypotheses

- There are statistically significant differences in the average scores of verbal communication between children who practice and do not practice movement education activities in kindergarten in favor of the children who practice.

- There are statistically significant differences in the average scores of non-verbal communication between children who practice and do not practice movement education activities in kindergarten in favor of the children who practice.

- There are statistically significant differences in the average scores of social communication between children who practice and do not practice movement education activities in kindergarten in favor of the children who practice.

d) Objectives of the study

The current study will identify:

-The extent of the commitment of tutors and kindergarten administrations in the application of laws that stipulate the need to generalize motor education to all kindergartens.

- Determining the effect of motor education activities on communication skills (verbal, non-verbal and social) by comparing the results of two groups of children: a group that practices motor education activities and another group that does not practice these activities.

- Provide recommendations for integrating motor activities into kindergarten programs to support the development of communication skills.

e) Interests

This study is pivotal for educational enhancement, offering insights into integrating motor education into kindergarten curricula. By highlighting the positive impact on communication skills, it advocates for holistic education supporting physical, cognitive, and social development in early childhood. It also emphasizes early intervention for children with communication difficulties, enhances social interactions, and guides parental support at home. Additionally, it lays a groundwork for future research, aiding resource allocation for impactful developmental programs.

f) Defining concepts and terminology

- Communication skills

According to Hargie (2010) Communication skills refer to the abilities that enable individuals to convey, receive, and interpret messages effectively in various contexts. These skills encompass verbal and non-verbal communication, active listening, writing, and interpersonal interactions. Effective communication skills are crucial for understanding and being understood, fostering collaboration, and building relationships. While from the point of view of Adler et al. (2016) they are the abilities used to send, receive and interpret messages through verbal and non-verbal means. These skills include speaking, listening, observing, and empathizing. They are essential for conveying information clearly and effectively, understanding others, and facilitating successful interactions and relationships.

Accordingly, communication skills can be defined by the extent to which the child uses verbal and non-verbal language, such as signs and gestures, to express his needs and feelings in an acceptable way, as well as in interacting with others and forming social relationships.

It is procedurally defined as the score a child gets on the scale of communication skills.

- kindergarten child

A kindergarten child refers to a young learner, typically aged between 4 and 6 years old, who is enrolled in a kindergarten program. it serves as the initial stage of formal education, where children are introduced to basic academic concepts, social skills, and structured learning experiences. The focus during this stage is on fostering cognitive, social, emotional, and physical development in a supportive and interactive environment. (Bredekam & Copple, 1997). And According to Charlesworth (2003), it is typically a young child aged between 4 and 6 years who is attending kindergarten, which are the first formal years of

education in many educational systems. During this period, children engage in activities that reinforce basic skills in reading, writing, numeracy and social interaction. The kindergarten experience is designed to prepare children for a more structured learning environment in elementary school, with an emphasis on play-based learning, socialization, and development of basic academic skills.

A kindergarten child is typically defined as one who has not yet started primary school but is nearing that stage, with the specific age varying by country. Researchers consider a child's readiness for primary school, including physical, mental, cognitive, social, and emotional development, rather than age alone. In this study, a kindergarten child is defined as being between the end of the third year and the end of the fifth or beginning of the sixth year, often attending a kindergarten institution to develop various skills and concepts for comprehensive development.

Procedurally, a kindergarten child is defined as a child between the ages of 3 and 6 years who regularly spends part of his day in one of the kindergartens located in the city of Al-Wadi, where the current study was conducted.

- Motor education

According to Gallahue et al (2012) Motor education refers to a pedagogical approach aimed at promoting the development of motor skills, coordination, and physical literacy in children through structured and purposeful activities. It encompasses a range of exercises, games, and tasks designed to enhance movement proficiency, body awareness, and overall physical competence. Motor education programs often incorporate elements of play, exploration, and skill progression to support children's physical development in a fun and engaging manner. And according to Gallahue & Cleland-Donnell (2020) it refers to a systematic approach to developing motor skills, coordination, and physical fitness through structured activities and exercises. It encompasses educational

strategies aimed at enhancing movement efficiency, body awareness, and overall physical competence in individuals, particularly children. Motor education programs often incorporate elements of play, exploration, and skill progression to support holistic development and lifelong engagement in physical activity.

In the context of this study, motor education is defined as a structured program comprising exercises and activities tailored to preschool-aged children, aimed at enhancing their physical development through a variety of movements, both fine and global. It serves as the specific form of physical education designed for the preschool stage, focusing on facilitating the child's mastery of their body and fostering physical abilities and independence.

Moreover, motor education is distinct from traditional sports education in that it is not governed by rigid rules or competitive frameworks. Instead, its primary objectives lie in promoting enjoyment, learning, and skill acquisition through movement. While the emphasis remains on purposeful physical activities, the overarching goal is to engage children in dynamic, fun-filled lessons that capitalize on their natural penchant for movement.

From a procedural standpoint, motor education embodies the pedagogical approach employed by educators to deliver content centered around purposeful motor activities tailored to the developmental needs of kindergarten children. This approach ensures that motor education classes are not only educational but also dynamic, vibrant, and conducive to the holistic development of young learners.

II) The practical chapter:

1. Followed Methodologies:

a) Population

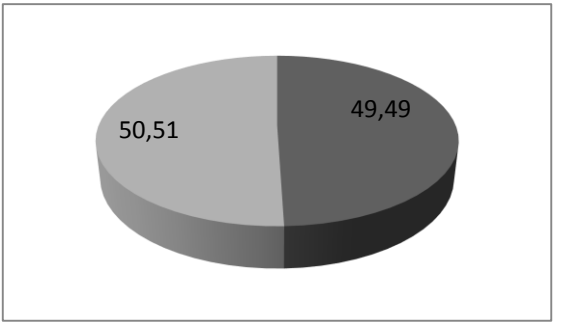
Refers "to a group of individuals sharing common characteristics, interests, or interactions within a specific geographical or social context" (Neuman, 2023).

On this basis, the available population was determined include children of both sexes (males and females) who regularly attend kindergartens in the city of Al-Wadi. A total of 24 kindergartens were included in the analysis, with an overall enrollment of 489 children. This group consisted of 176 boys and 313 girls, all aged between 3 and 5 years.

b) The study sample

For the study sample, multi-stage cluster sampling was employed to achieve the research objectives. This method involves selecting a small number of members from each cluster in stages, taking into account the hierarchical structure of the study population, and using simple or systematic random sampling instead of selecting all cluster elements (Särndal et al, 2003). The sample consisted of children who regularly attend kindergartens in the city of Wadi Suf. A total of 242 children were tested, including 92 boys and 150 girls, representing 49.49% of the population, as illustrated in Figure (1).

Fig.1. Representation of the sample in relation to the population



- Characteristics of the study sample

As previously indicated, the sample of children was selected in a multi-stage cluster method. The age of the children - the study sample- ranged between (3-5) years, as shown in the following table.

Table1. Mean and Standard Deviation of the Age Variable for the Study Sample

Age (years)	(f)	$M_f \times f$	$(M_f - \bar{M})$	$(M_f - \bar{M})^2$	$f \times (M_f - \bar{M})^2$
[3-4]	99	346.5	0.85	0.72	71.28
[4-5]	81	364.5	0.15	0.02	1.62
[5-6]	62	341	1.15	1.32	81.84
Total	242	1221			154.74

The mean for the sample is $\bar{M}$ =4.35, and the standard deviation is σ=±0.64

The sample was divided into two groups based on the kindergartens they attended. The first group consisted of 118 children (39 boys and 79 girls) who participated in motor education activities provided by their kindergarten. The second group comprised 124 children (44 boys and 80 girls) who did not engage in motor education activities, as their kindergartens did not offer such programs. To ensure the study's integrity and minimize the influence of confounding variables, both groups were assessed for homogeneity in terms of chronological age, sex, socio-economic status, family environment, and general health

c) Study Approach

To examine the role of motor education in improving communication skills in kindergarten children, we used the comparative approach. We compared two groups: one involved in motor learning and the other not, to assess differences in their communication development.

d) Defining and Adjusting Variables

The variables of the current study were identified as follows:

- **Independent Variable:** Motor education.
- **Dependent Variable:** Communication skills.

-Confounding Variables: Factors such as chronological age, gender, socioeconomic status, home environment, and general health, which may influence the dependent variable. These variables were identified and controlled to ensure homogeneity between the two groups.

e) Study Tool

For data collection, we used the communication skills scale of Abdel-Ghani Abdel-Aziz (2013).

- Tool Description

The scale comprises 36 statements, categorized into three areas: verbal communication, non-verbal communication, and social communication. Each statement is formulated as a declarative sentence, with three response options provided (always, sometimes, and rarely) These responses are scored as (3, 2, and 1) respectively. The total possible scores range from 36 to 108. Based on these scores, respondents' communication skills can be classified into three levels: high, medium, and low.

- Validity and reliability of tool

The validity of the study tool was determined by presenting it to a panel of seven (7) university professors specializing in motor education and educational psychology. The panel provided some observations regarding the modification of a number of statements constituting the study tool's content. These statements were subsequently revised and presented again to the group of professors to determine the agreement percentage using Cooper's equation:

$$Percentage\ of\ Agreement = \frac{Number\ of\ Agreements}{Number\ of\ Agreements + Number\ of\ Disagreements} \times 100$$

The agreement rate varied between 81.63% and 95.91% for all of the statements making up the tool, which represents a high agreement rate.

In addition to relying on expert validation, we assessed the tool's internal consistency to determine its validity. The modified scale was administered to an exploratory sample of 26 children from the available population. After educators completed the scale, the collected data were analyzed. The correlation coefficients for the items ranged from 0.48 to 0.73. According to the significance tables for correlation coefficients at an error rate of ≤0.05 with 24 degrees of freedom, the threshold value is 0.388. Consequently, items 3 and 32, which did not meet this criterion, were removed from the scale.

As for the determination of reliability, we relied on the method of splitting in half between even and odd items of the questionnaire, based on the results of the exploratory sample in the calculation of internal consistency, where the value of the reliability coefficient between them was (0.69), and after correction of the half-reliability coefficient using the Spearman-Brown "corrective" equation, the reliability coefficient between even and odd items reached (0.76), which is a high reliability coefficient, which reassures the use of the tool.

- Scale application

The scale was distributed and completed between March 22 and April 4, 2024. A total of 242 copies were collected, indicating full participation from all members of the basic sample. The responses were then transcribed and tabulated for statistical analysis.

f) Statistical Treatment Used in the Study

The data were transcribed and analyzed using the statistical analysis program SPSS and an Excel sheet. The following statistical approaches were employed:

- Percentages and Frequencies: These were primarily used to determine the frequency of categories, describe the sample under study, and assess the psychometric properties of the tool. Additionally, the P-ratio and chi-square tests were used to identify the homogeneity of the two study groups.

- Pearson Correlation Coefficient: This was used to measure the degree of correlation and calculate the internal consistency of the tool.

- Shapiro-Wilk Test: This test ensured the normality of the data distribution for each group.

- T-Test for Two Independent Groups: Used to determine the significance of statistical differences between two groups of unequal sizes.

2. 2. Presentation, analysis and interpretation of results:

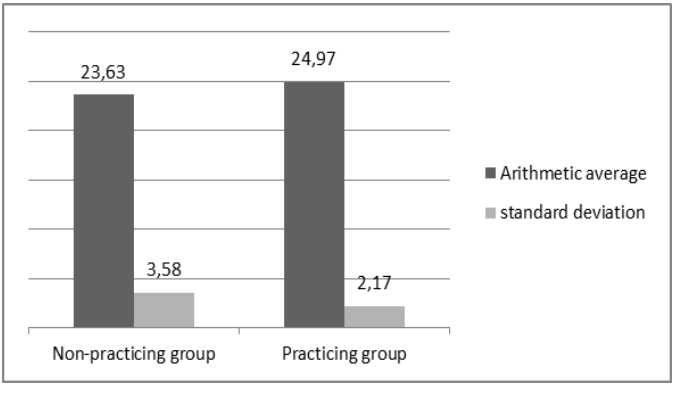
a) Presentation and analysis of the results of the first hypothesis:

Table 2. Significance of differences for the two research groups in verbal communication skills

Variable	Practicing		Non-Practicing		Calculated t-value	Significance of Differences
	$\bar{X}_1$	S_1	$\bar{X}_2$	S_2		
Verbal communication	24.97	±2,17	23.63	±3,58	3.70	Significant

The tabular value of T is 1.651 at α≤ (0.05) and df= 240. (Critical values for one-way t-test)

Fig.2. Results according to the arithmetic mean and standard deviation for the two study groups in verbal communication skills



The first hypothesis stated that there are statistically significant differences in mean verbal communication scores between children who and do not practice motor education activities in kindergarten in favor of children who practice them.

The results confirmed this hypothesis ; the results revealed that children who participated in motor education activities had significantly higher average verbal communication scores (24.97) compared to those who did not (23.63). The statistical analysis revealed a t-value of 3.70, which was significantly higher than the critical t-value of 1.651 at an alpha level of ≤ 0.05 with 240 degrees of freedom, indicating that the difference was not due to random chance. This suggests that motor education activities positively impact verbal communication skills in kindergarten children by providing structured and engaging practice opportunities. Figure 2 visually supports these findings, showing better verbal communication performance in the practicing group. These results underscore the importance of incorporating motor education into early childhood education to enhance communication verbal skills.

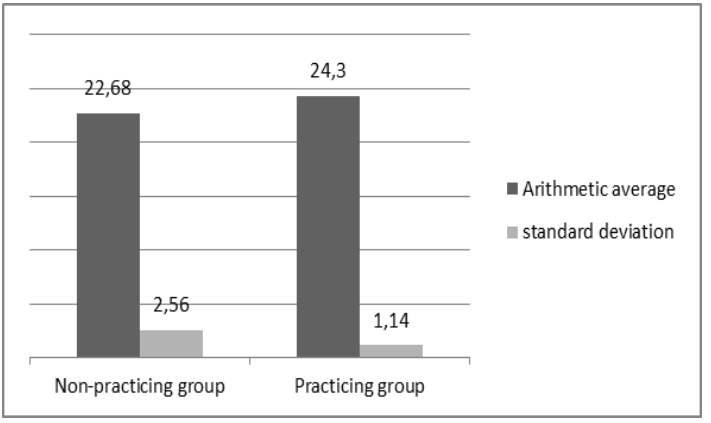
b) Presentation and Discussion of the Results of the Second Hypothesis:

Table 3. Significance of differences for the two research groups in non-verbal communication skills

Variable	Practicing		Non-Practicing		Calculated t-value	Significance of Differences
	$\bar{X}_1$	S_1	$\bar{X}_2$	S_2		
Non-verbal communication	24.30	±1.14	22.68	±2.56	6.48	Significant

The tabular value of T is 1.651 at α≤ (0.05) and df= 240. (Critical values for one-way t-test)

Fig.3. Results according to the arithmetic mean and standard deviation for the two study groups in non-verbal communication skills



The second hypothesis posited that there exist significant disparities in the average scores of nonverbal communication among children engaged in kindergarten motor education activities compared to those who are not. The findings substantiated this assertion, demonstrating that children involved in motor education exhibited notably higher mean non verbal communication scores (24.30) in contrast to their non-participating counterparts (22.68). Statistical analysis unveiled a calculated t-value of 6.48, surpassing the critical t-value of 1.651 at an alpha level of ≤ 0.05 with 240 degrees of freedom, indicating a statistically significant distinction. This suggests that motor education activities positively influence kindergarten children's nonverbal communication aptitude by furnishing structured and immersive practice opportunities. Visual representation in Figure (3) corroborates these findings, illustrating superior nonverbal communication performance within the participating group. These outcomes underscore the significance of integrating motor education into early childhood curriculum to enhance nonverbal communication proficiencies

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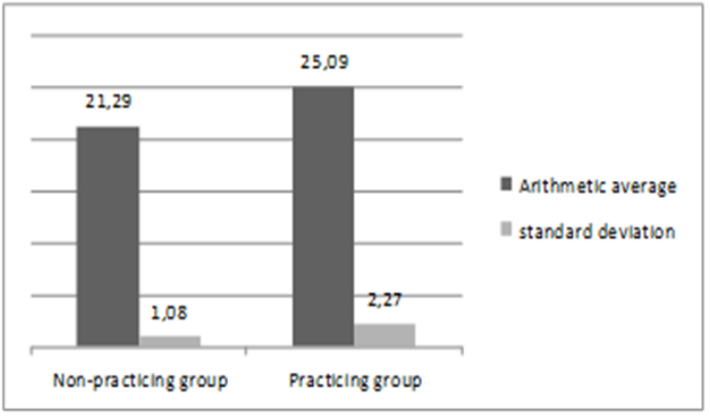
c) Presentation and discussion of the results of the third hypothesis:

Table 4. Significance of differences for the two research groups in social communication skills

Variable	Practicing		Non-Practicing		Calculated t-value	Significance of Differences
	$\bar{X}_1$	S_1	$\bar{X}_2$	S_2		
Social communication	25.09	±2,27	21.29	±1.08	6.511	Significant

The tabular value of T is 1.651 at α≤ (0.05) and df= 240. (Critical values for one-way t-test)

Fig.4. Results according to the arithmetic mean and standard deviation for the two study groups in in social communication skills



The third hypothesis posited that there are significant disparities in mean social communication scores between children engaged in motor education activities in kindergarten and those who were not. Results supported this assertion, demonstrating that children involved in motor education had significantly higher mean social communication scores (25.09) compared to their non-participating counterparts (21.29). Statistical analysis revealed a calculated t-value of 6.48,

exceeding the critical t-value of 1.651 at an alpha level ≤ 0.05 with 240 degrees of freedom (df), indicating a statistically significant distinction. This suggests that motor education activities positively influence kindergarten children's social communication skills by providing opportunities for structured and immersive practice. The visual representation in Figure 4 corroborates these results, illustrating superior social communication performance within the participating group. These results highlight the importance of integrating motor education into the early childhood program to improve social communication skills.

3. Discussion of results

The findings of the study indicate that there are statistically significant differences in the average scores of verbal communication between children who practice motor education activities in kindergarten and those who do not, with the former group showing higher scores. This result aligns with and is supported by existing literature and previous research.

Alignment with Existing Literature:

Cognitive and Motor Skill Development: Motor education activities have been shown to enhance various cognitive skills, including verbal communication. According to a study by Diamond (2000), physical activities that engage motor skills also stimulate brain regions responsible for language development and communication skills. This aligns with the finding that children practicing motor activities perform better in verbal communication.

Holistic development: Stodden et al. (2008) highlighted the interconnectedness of motor skills and overall child development. Their research suggests that motor skill proficiency is linked to higher levels of cognitive functioning, including verbal communication. The higher scores in the practicing group support this theory, indicating that motor activities contribute to more holistic developmental outcomes.

Social Interaction and Communication: Motor activities often involve group participation and cooperative play, which naturally encourage verbal interactions among children. Vygotsky's social development theory (1978) emphasizes the role of social interaction in cognitive development, including language acquisition. The improvement in verbal communication skills observed in the practicing group can be attributed to the increased opportunities for social interaction provided by motor activities.

Comparison with Previous Studies:

Study by Smith (As cited in McKenzie & Lounsbery, 2013):

Smith and colleagues found that preschool children who participated in regular physical activities showed significant improvements in both verbal and non-verbal communication skills compared to a control group. This study's findings are consistent with our results, highlighting the benefits of motor activities on communication skills.

Research by Carlson et al. (2013):

Carlson's research demonstrated that children involved in motor skill development programs exhibited better academic performance and communication skills. The significant differences in verbal communication scores in our study mirror Carlson's findings, underscoring the positive impact of motor education.

Meta-Analysis by Fisher et al. (2011):

A comprehensive meta-analysis by Fisher et al. concluded that physical activity interventions in early childhood are associated with improvements in cognitive and language skills. Our study adds to this body of evidence, showing that specific motor education activities can enhance (verbal, nonverbal, and social) communication abilities.

Conclusion

The results of this study, supported by existing literature and previous research, clearly demonstrate the positive impact of motor education activities on (verbal, nonverbal, and social) communication skills in kindergarten children. By fostering an environment that integrates physical and cognitive development, educators can significantly enhance children's communication abilities, providing a strong foundation for their future academic and social success.

- Research recommendations

1. Integrate Motor Activities into the Curriculum

- Include diverse motor activities in daily kindergarten programs, such as physical exercises, group games, and interactive tasks.
- Train educators to effectively combine motor activities with educational tasks.
- Allocate specific daily times for motor activities to enhance children's communication skills.

2. Recommendations for Parents

- Encourage motor activities at home through games, outdoor activities, and simple exercises.
- Promote participation in group sports or local sports clubs to boost social interaction and communication skills.

3. Recommendations for Educational Policies

- Develop policies to support and fund motor activity programs in kindergartens and schools.
- Encourage ongoing research to evaluate the impact of motor activities on communication and overall development.

4. Community Recommendations

- Develop community centers offering safe spaces for children to engage in motor activities.

5. Recommendations for Comprehensive Development

- Focus on holistic educational programs supporting physical, social, and linguistic development.

- Suggestions for Future Research

In light of the study, we recommend future research to examine the long-term effects of motor activities on communication skills and other developmental aspects in children. Proposed research topics include:

- The relationship between motor activities and cognitive development in early childhood
- The effects of different types of motor activities (e.g., structured sports vs. free play) on verbal and nonverbal communication skills
- The role of motor activities in reducing behavioral issues and enhancing emotional regulation in young children.

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