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INVESTIGATING THE IMPACTS OF MUSIC AND MOVEMENT ON GROSS MOTOR SKILLS OF PRESCHOOLERS IN IBADAN SOUTH WEST LOCAL GOVERNMENT

By

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Abstract: This study investigated the impacts of music and movement activities on the gross motor skills, physical coordination, and balance of preschool children in Ibadan South West. A quasi-experimental design was employed, involving an intervention group that participated in structured music and movement sessions and a control group that followed the standard preschool curriculum. Preschool children aged 3 to 5 years from selected institutions were randomly assigned to the groups. Pre- and post-intervention assessments were conducted using standardized instruments, and data were analyzed using descriptive statistics, paired-samples t-tests, and analysis of covariance (ANCOVA). The findings revealed statistically significant improvements in the intervention group's gross motor skills, coordination, and balance compared to the control group. These results support the integration of music and movement activities into early childhood curricula to enhance motor development. The study also underscored the need for teacher training, standardized assessment tools, and longitudinal research to optimize the benefits of such interventions.

Keywords: Music And Movement, Gross Motor Skills, Preschool Children, Physical Coordination, Balance, Early Childhood Education, Quasi-Experimental Design, Standardized Assessment, Ibadan South West.

INTRODUCTION

Early childhood education plays a pivotal role in laying the foundation for lifelong well-being, where nurturing physical capabilities goes hand in hand with cognitive and social growth. At this critical stage, children benefit immensely from environments that encourage active exploration and creative expression, which in turn foster improved coordination, balance, and overall body awareness. Emerging educational practices highlight the integration of dynamic and interactive experiences designed to stimulate various aspects of development, offering promising avenues to enhance physical performance and learning outcomes. Such integrative approaches have increasingly become a

focus of inquiry, particularly for their potential to strengthen Preschool children's gross motor skills

The development of gross motor skills is integral to preschool children's overall physical maturation, encompassing the use of large muscle groups in activities such as walking, running, jumping, and ball throwing (Milenkovic, 2022). Despite their importance, numerous studies indicate that many young children experience challenges in achieving optimal gross motor proficiency, which can adversely affect their daily functioning and participation in physical activities. As defined by Bindman et al. (2014), preschool children are children aged between three and five years who have not yet entered formal schooling—undergo rapid developmental changes, making their early experiences crucial for shaping future communication, socialization, cognitive, and emotional capabilities. Accordingly, it becomes essential to identify and implement effective interventions, such as those that incorporate music and movement, to bolster this aspect of development. Research suggests that enhanced gross motor skills not only contribute to physical health but also support academic readiness and sustained engagement in physical activities throughout life (MacDonald et al., 2016). Moreover, studies have demonstrated individual differences in motor skill acquisition; for instance, Kokstejn et al. (2017) observed that boys often outperform girls in basic motor tasks, while Zysset et al. (2018) confirmed the reliability of parental assessments in gauging motor performance, and Messerli-Bürgy et al. (2021) reported that early walking onset does not reliably predict subsequent motor or cognitive outcomes. Collectively, these findings highlight the need for further exploration of factors influencing motor development, particularly through music and movement interventions to optimize gross motor skills

Music is conceptualized as an organized assemblage of sounds or notes arranged to yield an aesthetically pleasing or meaningful experience. Within the framework of this study, music encompasses any auditory stimulus or melody employed to enhance the gross motor abilities of preschool children. In recent years, its integration into early childhood education has gained prominence as a viable strategy for advancing multiple developmental domains, including gross motor proficiency (Pahlevanian & Ahmadizadeh, 2014). In parallel, movement is defined as any physical activity engaging the muscles, bones, and joints—for instance, walking, running, skipping, and jumping. Here, movement denotes any systematically structured activity designed to foster the development of gross motor skills in preschool children, with movement-based interventions demonstrating significant efficacy in promoting both physical and cognitive development (Song et al., 2021).

The tempo of music, in particular, has been shown to exert a substantial influence on movement-related neural activity. Daly et al. (2014) demonstrated that variations in musical tempo can entrain neural circuits associated with movement, suggesting a promising mechanism for facilitating gross motor development in preschool children. Furthermore, Aristidou et al. (2021) revealed that music-driven motion synthesis, characterized by a cohesive global structure, can enhance the quality of movement in dance performance. Complementary research by Amelynck et al. (2014) indicates that body movement responses to music tend to be coherent and consistent, with more expressive movements linked to higher levels of musical enjoyment. In addition, Witek et al. (2015) found a significant relationship between syncopation, bodily movement, and pleasure within groove music, underscoring the potential of music to promote both movement and enjoyment in physical activities among preschool children.

The literature further supports the positive influence of integrated music and movement interventions on gross motor development. Levitin, Grahn, and London (2018) provide evidence that these interventions positively impact the gross motor skills of children. Music therapy, which employs music to enhance physical and emotional well-being, has been shown to improve motor skills in children with Autism Spectrum Disorder (Dvir et al., 2020). Historical perspectives, such as those offered by Gell (1959), affirm that music and movement activities are pivotal for the development of gross motor skills in young children, with direct observation serving as an effective evaluative method. Moelants (2003) reported that dance music influences movement and tempo preferences, while Palmer

(2001) suggested that such activities facilitate the development of both fine and gross motor abilities, insights that are further enriched by qualitative data from preschool educators. Bowling et al. (2019) noted that music and movement activities can trigger noradrenergic arousal, thereby enhancing movement capabilities, and Huffman and Fortenberry (2011) emphasized that these activities foster body awareness, balance, coordination, and spatial orientation. Moreover, Akamoglu et al. (2019) highlighted that physical activities integrating communication skills yield benefits that extend to motor performance.

Additionally, music interventions have been associated with improved language development, as Suggate and Stoeger (2014) observed that music facilitates word learning and vocabulary expansion. Other investigations (Christinaki et al., 2014; Halperin et al., 2013) have documented that music enhances motor coordination and attention—both critical to skill acquisition. Complementary to these findings, movement interventions—such as dance, yoga, and structured active play—have been empirically validated as effective strategies for augmenting gross motor skills, physical fitness, and overall health in preschool children (Pouplier et al., 2022; Queiroz et al., 2014).

An extensive review of empirical studies indicates that music and movement interventions substantially enhance the developmental outcomes of preschool children. Sánchez, Zelechowska, and Jensenius (2019) demonstrated that music significantly modulates motor behavior, evidenced by increased fractality in head sway during standing. Similarly, Samsudin, Bakar, and Noor (2019) reported that integrating music and movement improves spatial reasoning and problem-solving abilities, while Roach and Keats (2018) found that structured, skill-based active play more effectively advances fundamental movement skills compared to unstructured free play. Further research corroborates these findings by linking music-induced movement with improvements in balance, coordination, and body awareness (e.g., Veldman et al., 2019; García-Marín & Fernández-López, 2020), as well as enhanced cognitive, socio-emotional, and academic outcomes (Abril, 2011; Cheung, Shen, & Meadan, 2021; Niederer et al., 2011). Moreover, interventions that involve parental engagement and technology (Kipling et al., 2020) alongside tailored programs for children with developmental challenges (Murata & Tan, 2009; Altunsöz & Goodway, 2016) have also shown promise in fostering gross motor competence. Qualitative studies further emphasize music's role in promoting language development, creativity, social bonding, and cultural identity (Idogho, 2018; Obeng, 2022), thereby reinforcing the notion that integrating music and movement into early childhood curricula is a cost-effective and holistic strategy for enhancing gross motor skills.

Statement of the Problem

Early childhood is a critical period for developing the foundational skills that support lifelong learning and well-being. Globally, numerous studies have demonstrated that music and movement interventions can significantly enhance gross motor skills, including physical coordination, balance, and body awareness. These interventions have been successfully applied in various contexts, ranging from clinical settings to educational environments, highlighting their potential to foster both physical and cognitive development. However, in Nigeria, and particularly in Ibadan South West, there is a noticeable gap in research addressing how such interventions can be effectively implemented within preschool settings to improve gross motor competence.

Existing literature has primarily focused on the benefits of music and movement among diverse populations such as stroke patients, athletes, and students in different educational disciplines, with limited attention given to preschool children. Moreover, while some studies have examined the short-term effects of these interventions, there is a scarcity of longitudinal research that investigates their long-term impact on early motor development. Additionally, many of these studies suffer from a lack of standardized assessment tools, making it difficult to compare outcomes across different research efforts. Further gaps include limited exploration of neurophysiological mechanisms underlying music-induced movement, a narrow focus on typically developing children without consideration of diverse socioeconomic and developmental

backgrounds, and an underutilization of technology in integrating music and movement activities.

This study aims to fill these gaps by investigating the impacts of music and movement on the gross motor skills of preschool children in Ibadan South West. It will adopt a comprehensive approach, incorporating longitudinal designs, standardized assessment measures, and the potential role of technological tools to facilitate structured interventions. In doing so, the research seeks to contribute to a deeper understanding of how culturally and contextually relevant music and movement programs can be effectively integrated into early childhood education to enhance motor development and overall well-being.

Purpose of the Study

The main purpose of the study is to investigate the impacts of music and movement on gross motor skills of preschoolers in ibadan south west, specifically, the study aims to:

Investigate the impact of music and movement activities on the gross motor skills of preschool children in ibadan South West

Examine the effect of music and movement activities on the physical coordination and balance of preschool children in Ibadan South West

Research questions

What is the impact of music and movement activities on the gross motor skills of preschool children in Ibadan South West?

What is the effect of music and movement activities on the physical coordination and balance of preschool children in Ibadan South West?

Research Methodology

This study employed a quasi-experimental design to examine the impact of music and movement activities on the gross motor skills, physical coordination, and balance of preschool children in Ibadan South West. The research was structured to provide a comprehensive analysis of the intervention's effectiveness by comparing pre- and post-intervention assessments between an experimental group and a control group.

Study Design

A quasi-experimental design with an intervention group and a control group was utilized. Preschool children from selected institutions in Ibadan South West were assigned to either the experimental group, which participated in structured music and movement sessions, or the control group, which followed the standard preschool curriculum. Pre-tests and post-tests were administered to assess changes in gross motor skills, coordination, and balance.

Population and Sampling

The study targeted preschool children aged 3 to 5 years who were enrolled in selected preschools in Ibadan South West. A purposive sampling technique was used to select institutions that met predetermined criteria, and within these institutions, children were randomly assigned to either the intervention or control group to ensure comparability.

Intervention Protocol

The intervention consisted of structured music and movement activities specifically designed to enhance gross motor skills. The sessions were conducted over a 12-week period, with activities taking place twice weekly. Standardized lesson plans were developed to ensure consistency across sessions, and preschool teachers were trained to deliver the activities effectively.

Data Collection Instruments

Quantitative data were collected using standardized assessment tools. The Test of Gross Motor Development (TGMD-2) and other coordination and balance assessments were administered to measure the targeted outcomes. Baseline data were collected before the intervention, and follow-up assessments were conducted immediately after the 12-week period.

Validity of the Instrument

The validity of the instruments was established prior to the commencement of the study. Experts in early childhood education and physical therapy reviewed the content of the instruments, ensuring that they were appropriate for measuring gross motor skills, physical coordination, and balance in preschool children. Pilot testing was also conducted to confirm that the instruments accurately captured the intended constructs, thereby affirming their content and construct validity.

Reliability of the Instrument

The reliability of the instruments was determined through both test-retest and internal consistency measures. Pilot studies demonstrated that the instruments yielded consistent results over time, with test-retest reliability coefficients and a

Cronbach's alpha coefficient of 0.87, which met or exceeded accepted standards. These measures confirmed that the instruments were reliable for assessing the targeted motor skills in the preschool population.

Data Analysis

Data were analyzed using descriptive statistics to summarize participant characteristics and baseline performance. Inferential statistical tests, including paired-samples t-tests and analysis of covariance (ANCOVA), were employed to compare pre- and post-intervention outcomes within and between the groups. This analysis helped determine whether the observed differences in gross motor skills, coordination, and balance were statistically significant.

Results of finding

Table 1: Paired-Samples t-Test Results for Pre- and Post-Intervention Scores (Intervention Group) (Data Analysis: Paired-Samples t-Test)

Variable	Pre-Test Mean (SD)	Post-Test Mean (SD)	t-value	p-value
Gross Motor Skills	45.2 (5.1)	53.7 (4.8)	-6.23	< .001
Physical Coordination	42.5 (6.0)	50.8 (5.4)	-5.67	< .001
Balance	40.3 (4.7)	48.9 (5.0)	-7.12	< .001

Interpretation

The paired-samples t-test revealed statistically significant improvements in the intervention group for all measured variables. Specifically, the gross motor skills, physical coordination, and balance scores increased significantly from pre-test to post-test (all $p < .001$), indicating that the music and movement activities had a positive impact on these aspects of motor development.

Table 2: ANCOVA Results Comparing Intervention and Control Groups (Data Analysis: Analysis of Covariance [ANCOVA], controlling for baseline scores)

Variable	F-value	p-value	Partial Eta Squared
Gross Motor Skills	18.45	< .001	0.245
Physical Coordination	15.32	< .001	0.212
Balance	20.67	< .001	0.267

Interpretation

The ANCOVA results demonstrated that, after controlling for baseline differences, the intervention group significantly outperformed the control group in gross motor skills, physical coordination, and balance. The significant F-values and corresponding p-values (all $p < .001$) along with moderate to large effect sizes (Partial Eta Squared ranging from 0.212 to 0.267) provided strong evidence that the music and movement activities were effective in enhancing the gross motor development of preschool children in Ibadan South West.

Discussion of Findings

Impact on Gross Motor Skills

The study revealed a statistically significant improvement in gross motor skills among preschool children following the music and movement intervention. This finding is consistent with earlier research that demonstrated music's influence on motor behavior, as reported by Sánchez, Zelechowska, and Jensenius (2019). Their work showed that music could modulate movement dynamics, which likely contributed to the enhanced gross motor outcomes observed in this study. In addition, the structured nature of the intervention resonates with findings by Roach and Keats (2018), who emphasized that skill-based active play leads to better motor development compared to free play. Collectively, these results underscore the potential of integrating music with movement to foster significant improvements in the overall gross motor abilities of preschool children.

Effects on Physical Coordination

The results also indicated a significant enhancement in physical coordination following the intervention. This improvement aligns with previous studies suggesting that music-induced movement activities can effectively enhance coordination. For instance, research by Veldman et al. (2019) and García-Marín and Fernández-López (2020) documented improvements in body awareness and coordination when music was incorporated into physical activities. Moreover, the rhythmic elements of music, which have been

shown to entrain neural circuits related to movement (as suggested by studies like Daly et al., 2014), may have contributed to better neuromotor control in the participating children. The significant pre- and post-intervention differences provide empirical support for the effectiveness of structured music and movement activities in improving physical coordination in preschool settings.

Effects on Balance

The study further found that balance significantly improved among children exposed to the music and movement activities. This finding is supported by literature that associates musical rhythm and structured movement with enhanced proprioceptive and balance skills. Research by Amelynck et al. (2014) and Witek et al. (2015) highlighted that music can evoke coherent body movement responses, which facilitate better balance and spatial awareness. The observed improvement in balance is indicative of the intervention's role in enhancing sensory-motor integration, thereby contributing to more stable and coordinated movements among preschool children.

Overall Interpretation

Overall, the findings from this study strongly indicate that structured music and movement interventions can significantly improve gross motor skills, physical coordination, and balance in preschool children in Ibadan South West. These results are in line with global research trends emphasizing the multidimensional benefits of integrating music into physical activity programs (Abril, 2011; Cheung, Shen, & Meadan, 2021). By addressing previous research gaps, particularly the lack of localized studies and standardized assessments in the Nigerian context, this study contributes valuable insights that could inform the development of more effective early childhood education curricula. The significant improvements observed across all measured domains underscore the potential for such interventions to promote holistic physical development in preschool populations.

Summary of the Findings

The study found that structured music and movement interventions significantly improved the gross motor skills, physical coordination, and balance of preschool children in Ibadan South West. Descriptive statistics indicated marked improvements in baseline scores, while inferential tests—specifically paired-samples t-tests and ANCOVA—revealed that the intervention group experienced statistically significant gains compared to the control group. These findings suggest that incorporating music and movement into early childhood education should enhance motor development effectively.

Conclusion

In conclusion, the findings provide compelling evidence that music and movement activities should be integrated into the preschool curriculum in Ibadan South West. The results indicate that such interventions contribute to improved gross motor skills, enhanced physical coordination, and better balance. Therefore, it is clear that music and movement interventions should be regarded as essential components for promoting holistic physical development in preschool children.

Recommendations

Based on the study's findings, the following recommendations should be considered:

Preschool curricula should be revised to include structured music and movement sessions, ensuring that these activities are implemented regularly to foster continuous development of gross motor skills.

Educators should be provided with specialized training on delivering music and movement interventions effectively, thereby enhancing their instructional practices.

The use of standardized and validated assessment tools should be adopted to monitor the progress of children's motor skills systematically.

Intervention programs should be tailored to accommodate diverse populations, including children with developmental delays or those from different socioeconomic backgrounds, ensuring that all preschool children benefit.

These recommendations should guide policymakers, educators, and researchers in optimizing early childhood education programs to enhance the overall development of preschool children in the region.

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