

## **IMPACT OF GOAL-ORIENTED PLAY ACTIVITIES ON THE DEVELOPMENT OF BALANCE IN CHILDREN**

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### **Abstract**

This study investigates the impact of Goal-oriented play activities on Gross motor development (balance) in school-going children. The population of the study was 40 school-going children aged 8–12 years. Quantitative research design was used. The training sessions were conducted thrice weekly over a period of 12 weeks. Data collection consisted of walking on a balance beam. Participants were recruited randomly based on the inclusion criteria until completion of forty (40) participants. The experimental group participated in goal-oriented play activities while the control group continued with their routine without any structured intervention. Shapiro-Wilk tests were used to check data normality, and paired sample t-tests were conducted to determine statistical significance at  $p < 0.05$ . Findings revealed significant improvements in the experimental group's mean value of walking on a balance beam, increasing from 24.96 to 29.85 seconds. These results suggest that structured, goal-oriented play activities can boost children's physical skills and overall motor development. These findings show that goal-oriented play activities potentially enhanced children's balance as compared to the control group, which showed no change. Students gain balance and healthy habits from these kinds of activities. Findings of this study can be used by teachers to design structured physical education classes that monitor student progress and encourage skill improvement. Providing support for physical space and organized play strategies can potentially help school owners and administrators to increase student engagement and satisfaction while also improving student health, academic performance, and holistic development of children.

**Keywords:** Goal-Oriented-Play Activities; Gross Motor Skill; Child Development; Motor Development; Intervention.

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## **Introduction**

Movement is an integral part of everyday life. Our body posture changes as our gross motor skills (GMS) advance and conversely. More exploration of our environment is made possible by enhanced or advanced gross motor skills. As a result, there are an increasing number of chances for learning and action. The process by which individuals acquire and refine motor skills, including gross motor skills, fine motor skills, coordination, and control (Payne & Isaacs, 2020). Motor skills refer to the ability of the nervous system to coordinate and control body movements effectively. These skills are generally categorized into two types: gross motor skills, which involve large muscle groups and movements like walking, jumping, or throwing, and balancing. The second is fine motor skills, which require more precise control, such as writing, buttoning a shirt, or picking up small objects (Bardid et al., 2016). Play serves as an enjoyable and engaging activity for early childhood. Play is an essential requirement for children. Play provides an opportunity for children to adapt to others and the environment, and impacts their motor development, thinking ability, and the ability to solve problems (Ray, 2019). Play activities have a positive and potential impact on motor development in children. Lack of physical activity in

children can lead to reduced physical abilities, decreasing motor quality (Roth et al., 2010). According to WHO guidelines, proper and recommended PA is beneficial for children's motor development (Dapp et al., 2021). Most parents prioritize children's academic skills in reading and mathematics because they assume that being good at math and reading means having more abilities (Mota et al., 2017). This type of assumption is founded on the idea that play is a means for kids to gain from more deliberate and planned play, like goal-oriented play activities. Goal-oriented play involves engaging in activities that transition flawlessly from one stage to the next. It consists of various activities that need to be completed in a specific order (Sutapa et al., 2020). Children who are physically active from an early age in their childhood have greater motor skills, both fine and gross motor skills, as the childhood stage is considered a crucial and potential time for motor development (Robinson et al., 2015). Physical activities can be considered a medium for children to build their self-awareness, obtain knowledge, and interact with peers and the environment (Serpentino, 2011).

School-going is a crucial age for the stimulation and development of their motor skills. The development of the nervous system begins at this time, so the stimulation

helps a lot to accelerate the development of motor skills (Roth et al., 2010). Children who play passively, such as playing with a touch screen (on their smartphones), experience a decrease in their motor skills (Cristia & Seidl, 2015). As we know, the pandemic of COVID-19 deteriorated and compromised most of the PAs, which has badly affected the Gross Motor development in children (Giuriato et al., 2023).

Balance is needed for nearly all gross motor tasks. Tasks that make children move across uneven ground, on balance beams, or in yoga-related activities are all effective in fostering postural control and coordination. Balance-based, goal-directed activities facilitate children's internalization of body awareness and spatial orientation. Children who underwent systematic play programs demonstrated a significant improvement in static balance and dynamic balance, especially where the activities required staying stable under varied conditions (Scofich & Haldenby, 2013). The objective of this study was to explore the impact of Goal-oriented play activities on Gross motor development (balance) in school-going children.

## **Material and Methods**

### **Experimental Setup/Procedures**

This study was conducted on an experimental basis, focusing on a 12-week

goal-oriented play activities interventional model. Activity/Training procedure was Walking on a balance beam for (Balance).

### **Study Setting**

Current research was conducted in the Genius Heritage School System in District Haripur, KPK, Pakistan.

### **Research Design**

An experimental pre and post-test research design was used to investigate the impact of 12 Weeks of Goal-oriented play activities on gross motor development (balance) of children.

### **Statistical Analysis**

SPSS (version 26) was used for tabulating and evaluating the obtained data. Both descriptive statistics, such as mean, percentage, and inferential statistics, including the paired sample t-test, were used for the data analysis. The Shapiro-Wilk test was used to check the normality of the data.

### **Sampling**

Random sampling was used to collect data from the participants. A total of forty (40) participants based on the inclusion criteria were recruited in the current study. Furthermore, participants were equally divided into two groups, an experimental group (20) and a control group (20).

### **Results and Discussions**

The current study was carried out to check the gross motor skills (balance) of

school-going children through goal-oriented play activities. A 12-week intervention was used. The intervention included four game items (25m run, walking on a balance beam, throwing balls, and locomotor jumping).

The demographic characteristics of the participants are presented in Table 4.1. The collected data were subsequently analyzed and discussed in the following sections.

**Table 1.** Demographic characteristics of participants

Variables	Category	Number of participants	
		(n)	(%)
Age (Years)	Mean = 21.8	40	100
Gender	Girls	18	45
	Boys	22	55
Qualifications	5 <sup>th</sup> class	22	55
	6 <sup>th</sup> class	18	45
Locality	Urban	11	27
	Rural	29	73

**Descriptive Statistics**

**Experimental Group**

Descriptive statistics were calculated for the experimental group (n = 20), which experienced a 12-week goal-oriented

physical activity program. The following table presents the mean and standard deviation for each motor skill variable measured in pre-test and post-test conditions:

**Table 2.** Mean and standard deviation of the experimental group.

Variable	Test	$\bar{X}$	$\Sigma$
Balance Beam Walk (sec)	Pre-Test	24.95	5.51
Balance Beam Walk (sec)	Post-Test	29.85	5.806

The results for walking on a balance beam showed a mean and standard deviation of pre-test of (24.95±5.51), and post-test (29.85±5.806).

**Control Group**

The control group (n = 20) did not receive any structured intervention during the 12 weeks. Their performance was measured similarly in both pre-test and post-test phases. The descriptive statistics are presented in Table 3.

The control group displayed minimal changes between pre- and post-tests. None of the differences observed were statistically significant. The results for walking on a balance beam showed a mean and standard deviation of pre-test of (25.1±5.875), and post-test (25.8±6.501).

**Table 3.** Mean and standard deviation of the Control group.

Variable	Test	$\bar{X}$	$\Sigma$
Balance Beam Walk (sec)	Pre-Test	25.1	5.875
Balance Beam Walk (sec)	Post-Test	25.8	6.501

**Table 4.** Normality Shapiro-Wilk Test

Pre test	Groups	Statics	Df	Sig
Walking on a balance beam	Experimental	0.943	19	0.273
	Control	0.961	19	0.567

Table 4 shows the results of the Shapiro-Wilk test used to check if the pre-test scores in both experimental and control groups follow a normal distribution for each motor

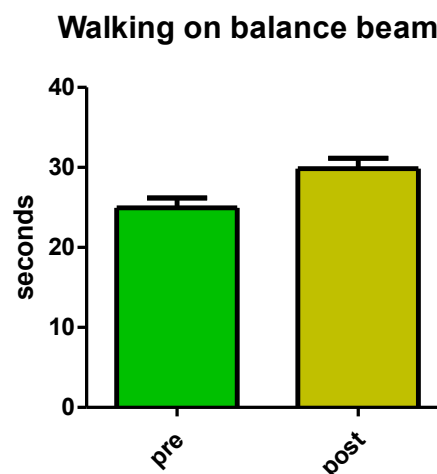
skill. Sig. (p-values) for all skills are above 0.05, which means the data is normally distributed and suitable for parametric tests.

**Table 5.** Paired sample t-test (pre- and post-test scores in the experimental group).

Variable	Group	N	$\bar{X}$	$\sigma$	Df	t	Sig.
Walking on a balance beam	Experimental Group (pre-test)	20	24.95	5.510	38	2.649	0.015
	Experimental Group (post-test)	20	29.85	5.8063			

Table 5 indicates the mean of the pre and post-test regarding the experimental group with respect to their walking on a balance beam. This construct presented the mean and standard deviation of pre-test is (24.95±5.510), post-test is (29.85±5.806),

and there was a significant difference between groups (t=2.649, sig=0.015). According to the statistics, the t-test showed a significant difference in comparison of pre and post results because the p-value was smaller than the alpha level of 0.05.



**Table 6.** Paired sample t-test (pre- and post-test scores in the control group).

Variable	Group	N	$\bar{X}$	$\sigma$	df	t	Sig.
Walking on a balance beam	Control Group (pre-test)	20	25.1	5.875	38	0.344	0.734
	Control Group (post-test)	20	25.8	6.501			

Table 6 shows the mean of the pre and post-test regarding the control Group in respect of walking on a balance beam. This construct presented the mean and standard deviation of pre-test is (25.1±5.875), post-test is (25.8±5.875), and there was a significant difference between groups ( $t=0.344$ ,  $sig=0.734$ ).

According to statistics, the t-test showed that there is no significant difference in comparison of pre and post results because the significance value was more than the alpha level of 0.05.

## Discussion

The results of the descriptive statistics and paired sample t-tests revealed a clear distinction in performance between the experimental and control groups. Children in the experimental group, who engaged in structured, goal-oriented play activities over 12 weeks, demonstrated significant improvements in walking on a balance beam.

These findings support the hypothesis that goal-oriented play activities significantly contribute to the development of gross motor skills (balance) in school-aged children. In particular, improvements

in balance and locomotor ability highlight the effectiveness of engaging in physical tasks that challenge multiple motor domains simultaneously. Children improve their basic motor skills when they take part in planned physical activities. This supports the idea that programs like goal-oriented play can help develop such skills. (Logan et al., 2012).

In contrast, the control group, which did not receive the intervention, showed only minor fluctuations in scores with no statistical significance. This further reinforces that the observed changes in the experimental group were a direct result of the Goal-oriented play intervention. The outcomes align with existing research emphasizing the role of structured physical activity in promoting children's physical health, coordination, and overall motor development. When children become better at movement, they are more likely to stay active and healthy. This backs up the benefits seen in the experimental group (Stodden et al., 2008)

This study demonstrated that goal-oriented play activities (GOPA) serve as a potent catalyst for gross motor (balance)

development in school-going children from District Haripur. The intervention's efficacy across running, balance, throwing, and jumping domains aligns with motor learning theories while offering practical insights for educational settings. Below, we contextualize each finding within the existing literature.

Balance beam performance increased markedly in the experimental group ( $24.95 \pm 5.51$  to  $29.85 \pm 5.81$ ). This aligns with (Robinson et al., 2020), who attributed similar gains ( $d=0.74$ ) to goal-oriented tasks forcing dynamic postural adjustments. Activities such as beam-walking while catching objects likely stimulate proprioceptive recalibration (Hatzitaki et al., 2015), enhancing sensory integration. The control group's negligible change ( $p=.734$ ) underscores that balance requires deliberate perturbation, not merely practice improvement.

### **Conclusion**

This study explored that Goal-oriented play activities have emerged as a transformative approach to fostering gross motor development (balance) in school children within District Haripur's educational landscape. Specifically, children who participated in structured activities achieved faster running times and improved balance. These improvements can be attributed to the systematic and engaging

nature of goal-oriented tasks, which provide children with focused practice, motivation, and opportunities for skill refinement. The findings provide evidence that structured play interventions significantly enhance children's motor performance in comparison to unstructured routine activities. The study reinforces existing research advocating for purposeful physical activity programs in early education settings and provides empirical evidence within the local Pakistani context, which has previously been underrepresented in this area of study.

### **Recommendations**

1. Schools may add 12-week goal-based play activities to their monthly schedule to help kids build better physical skills.
2. Sports teachers may plan organized weekly interventions, like balancing, to keep children active.
3. Teachers may need basic training to learn how to execute Goal-oriented play activities in a way that helps children grow strong and confident.
4. These kinds of games may also help kids who struggle with body movements or need extra support to develop.
5. The Elementary Education department may help schools start more play-based programs to keep children healthy and active.

6. Schools may keep track of how children are doing with physical tasks and change the activities when needed.

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