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Effectiveness of Using "Flashfit" for Improving Balance in Individuals with Cerebral Palsy

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Abstract:

- ***Background:***

Cerebral palsy (CP) causes motor and balance impairments that affect mobility and independence. As traditional therapies may lack engagement, interactive devices like Flashfit use game-based therapy to make rehabilitation more motivating. This study evaluated "Flashfit" effectiveness in improving balance in children with CP, showing positive outcomes and supporting its use in modern rehabilitation programs.

- ***Method:***

A quasi-experimental study was done to find the effectiveness of balance exercises to improve the balance functions in children with cerebral palsy. A total number of 10 children with cerebral palsy participated in this study. The intervention consisted of 45 mins/session; 3 sessions/ week; total 24 sessions/8 weeks . Balance was assessed pre- and post-intervention using the Community Balance and Mobility Scale (CB&M), a reliable and valid tool for measuring "high-level" balance and mobility impairments. pretest and post-test scores were compared to determine the effectiveness of the intervention.

- ***Results:***

The study demonstrated that a 24-session intervention using the interactive device "Flashfit" led to significant improvements in balance among individuals with cerebral palsy. CB&M scores showed a substantial increase post-intervention ($p < 0.05$), reflecting enhanced static and dynamic balance. With high adherence (90%) and positive participant feedback, the results highlight the motivating and engaging nature of interactive device, supporting its effectiveness as a rehabilitation tool for improving balance in cerebral palsy.

- ***Conclusion:***

The study found that "Flashfit" effectively improved balance in individuals with cerebral palsy, as shown by significant CB&M score improvements. Its interactive, game-based approach also increased engagement, motivation, and adherence, making therapy more enjoyable. These findings highlight Flashfit as a valuable tool for rehabilitation, offering both functional and psychosocial benefits, with further research needed to assess long-term effects.

Keywords: *Cerebral Palsy, Balance, Interactive Device, Community Balance and Mobility Scale.*

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I. INTRODUCTION

- *Cerebral Palsy*

Cerebral palsy as a group of permanent movement disorders that appear in early childhood. It affects muscle coordination and body movement is caused by abnormal brain development or damage to the developing brain (WHO). Delay in reaching motor mileposts and poor motor control are two characteristics of cerebral palsy (CP), an experimental complaint. Cerebral palsy is associated with neuromuscular impairments. It includes abnormal muscular tone, the inability to control one's movement tone that causes an antagonistic and agonistic disparity muscles, a lack of coordination, abnormal sensory perception, and weakness (1).

Children with cerebral palsy have poor postural control should have been demonstrated to originate from

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several sources muscular-skeletal issues such contractures and a decreased range of motion as well as changes in initial alignment, all have an impact on reactive balance intervention among individuals with cerebral palsy. Additional motor components involve the disturbance of the time and spatial elements of postural muscle responses during the stabilization process after an unforeseen external disturbance (2) (3).

➢ *Types of Cerebral Palsy*

Cerebral palsy is classified based on the number of limbs affected and the specific area of the brain involved. (4) (5).

- *Based on Number of Limbs Affected:*

Cerebral palsy is categorized into five types based on the number of limbs affected.

✓ Quadriplegia involves all four limbs,
✓ Diplegia primarily affects both legs.
✓ Hemiplegia impacts the upper and lower limbs on one side of the body.
✓ Monoplegia affects a single limb.
✓ Triplegia involves both legs and one arm.

- *Based on Areas of Brain Damage:*

According to the location of brain damage, there are five different types of cerebral palsy: Spastic, Dyskinetic, Ataxic, Athetoid, and mixed.

➢ *Prevalence of Cerebral Palsy*

Globally, estimates suggest that CP affects approximately 1 to 4 per 1,000 live births. (6) The prevalence of CP in India appears to be around 2 to 3 per 1,000 live births, with variations based on geographical region and access to healthcare (7) the prevalence of CP as 2.0 per 1,000 live births in a rural setting in Tamil Nadu, South India. (8).

➢ *Balance*

The ability to maintain an upright posture while performing a task is known as balance. This includes both stability-related static balances and motion-related dynamic balance. In a variety of settings, including sitting, standing, walking, and climbing up or down stairs, balance is necessary**.** It is essential to stay balanced in a gravitational field by making sure that your centre of mass remains above the support base. The idea was given by (9).

➢ *Types of Balance*

Balance comes in two varieties.

- Static balance.
- Dynamic balance.

➢ *Static Balance*

Maintaining a fixed position of the body is called static balance. Individuals can maintain a static balance by maintaining upright posture and orientation while the body is at rest and the centre of mass is above the base of support (10).

➢ *Dynamic Balance*

Dynamic balance is the ability to shift weight between the legs and in different directions while maintaining an upright posture. Walking on various surfaces helps to test balance by activating the vestibular (inner ear) and proprioceptive (body awareness) systems (11). The capacity of maintaining balance while standing or sitting is a significant indicator of a person's health and standard of life. To keep your body position straight and carry, an individual's capacity to maintain balance while sitting and standing is a strong predictor of their safety and quality of life. Static and dynamic balances are vital for job completion and maintaining a stable posture.

➢ *Balance and Cerebral Palsy*

Balance control is essential for most functioning tasks. Children with cerebral palsy have poorer postural balance skills than children with normal development. The common secondary musculoskeletal problems and the delayed and impaired development of cerebral motor control systems are likely the causes.

➢ *Interactive Device*

"Flashfit" training is a type of brain-body fitness where the body is used to train the brain, hence enhancing and maintaining human performance. It is an innovative approach to brain-body training that uses sensory inputs to stimulate and promote brain development through physiological reaction. It helps individuals measure performance data quickly and encourages them to work out effectively. The "Flashfit" brain-body workouts improve brain plasticity, which helps to prevent a cognitive decline, and increase strength and balance to prevent falls. Children with multiple disabilities had an 80.0% increase in wellbeing as a result of the interactive game. A pleasant environment provides a greater effective impact on children' emotions. During the session, their emotional state improved by 86.6%, and they also seemed more comfortable participating in "Flashfit" interactive activities because they were less stressed.

➢ *Flashfit Iwall*

Fig 1 Interactive device (Flashfit Iwall)

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➢ *Flashfit Ifloor*

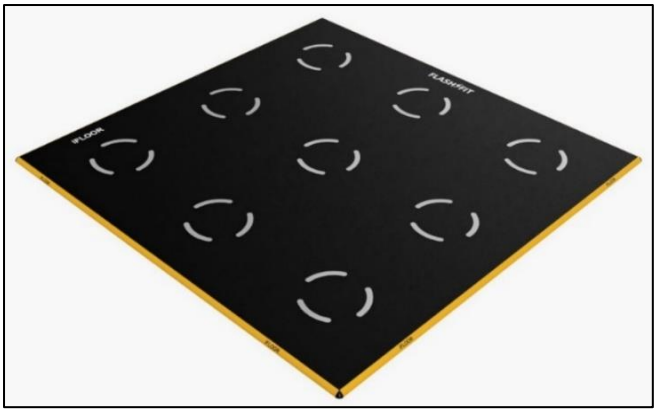

Fig 2 Interactive Device (Flashfit Ifloor)

➢ *Aim and Objectives*

- *Aim:*

To find the effectiveness of the interactive device "Flashfit" for improving the balance in individual with cerebral palsy.

- *Objectives:*

To determine the pre and post values of balance for individual with cerebral palsy.

➢ *Need of the Study*

This study aimed to evaluate the effectiveness of the interactive device "Flashfit" in improving balance among individuals with cerebral palsy (CP), a neurological condition that impairs posture, movement, and mobility. Balance deficits in CP increase fall risk and reduce independence, making effective interventions essential. The Community Balance and Mobility (CB&M) test, a reliable tool for detecting subtle changes in high-level balance, was used as a pre- and post-test measure. Traditional therapies, while beneficial, often lack engagement, real-time feedback, and measurable outcomes, which can limit motivation and adherence particularly in children. In contrast, "Flashfit" offers an interactive, customizable, and gamified approach that provides real-time visual and auditory feedback, enhancing motor learning, motivation, and active participation. By delivering objective performance metrics, it enables therapists to monitor progress and personalize interventions. Despite the increasing use of technology in rehabilitation, evidence on devices like "Flashfit" remains limited, making this study an important step toward more engaging, effective, and innovative rehabilitation strategies for individuals with cerebral palsy.

II. REVIEW OF LITERATURE

- A study on "Interactive computer play as "motor therapy" for individuals with cerebral palsy" was conducted out by Shannon Knights, MD, Lauren Switzer, MSc, Briar Findlay, BSc, and Darcy Fehlings, MD, FRCPC.The purpose of the study was to evaluate the quality of research on the use of interactive computer play (ICP) to improve motor performance in people with cerebral palsy, including strength, control, and cardiovascular [CVS] fitness. A computer-assisted literature search focused on ICP as a therapy method to improve motor outcomes in people with cerebral palsy of all ages. Improving cardiovascular fitness and raising upper and lower extremity motor outcomes were the main goals of the search. The American Academy of Neurology's guidelines were used in classifying the articles, and the recommended classification were determined by the degrees of evidence. Seventeen publications were analysed in full, including six on upper extremity motor function, five on lower extremity motor function, one on CVS fitness, and five on studies that addressed either CVS fitness, the upper or lower limbs, or both. Overall, there was level B (likely) evidence in favor of ICP therapies to improve lower extremity motor function or control. (12).
- JA Howe, EL Inness, A Venturini, MC Verrier was conducted study on "The Community Balance and Mobility Scale a balance measure for individuals with traumatic brain injury". To show the reliability and validity of the Community Balance and Mobility Scale, an original outcome measure of balance designed for ambulatory individuals with traumatic brain injury. acute care, day hospitals, and inpatient and outpatient rehabilitation. 2 convenience samples of ambulatory traumatic brain injury patients (n = 36, 32) were used. A reliable and valid outcome measure for ambulatory individuals with traumatic brain injury is the Community Balance and Mobility Scale. (13).
- Antoni Jaume-i-Capó, Pau Martínez-Bueso, Biel Moya-Alcover, and Javier Varona conducted study on "Interactive Rehabilitation System for Improvement of Balance Therapies in People with Cerebral Palsy". Children with cerebral palsy have a lengthy and intricate rehabilitation process that seeks to teach them daily living skills, restore their compromised functions, and enhance their movement. This approach can benefit from the usage of innovative technology and interactive rehabilitation systems. Numerous research studies have looked into the use of virtual reality-assisted exergaming and interactive rehabilitation systems for the rehabilitation of kids with cerebral palsy. shows how new technology, such as virtual reality serious games, can help kids with cerebral palsy with their motor therapy. talks about the creation of an "Interactive Rehabilitation Carpet" that can be used to help kids with cerebral palsy get back on their feet. Furthermore, the search results emphasize the value of home-based rehabilitation exercises and parental participation in the healing process. (14)

III. METHODOLOGY

➢ *Research Design:*

Quasi-experimental design. (single group pre and post-test).

➢ *Study Setting:*

The study was conducted in Special School at NIEPMD, Chennai.

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➢ *Sampling Technique:*

- Convenience Sampling

➢ *Sample Population:*

Individual who has been diagnosed with Cerebral palsy.

➢ *Sample Size:*

- Sample size (n) = 10

➢ *Variables:*

- Dependent Variable: Balance
- Independent Variable: Interactive device (FLASHFIT)

➢ *Screening Criteria*

➢ *Inclusion Criteria*

- Children who are diagnosed with cerebral palsy.
- Age group from 13 to 18 years.
- GMFCS Level 1- 3
- Individual of both genders.

➢ *Exclusion Criteria*

- Inability to follow simple comments.
- Individual with co-morbidities affecting motor performance such as seizure and other neurological conditions.

➢ *Duration of Study*

45 minutes for each session, 3 sessions per week , 24 sessions for 8 weeks.

➢ *Tool Description*

- *Community Balance and Mobility Scale (CB&M)*

Community balance and mobility scale (CB&M) Scale was developed by Howe J, Inness E, Venturini, Williams JI, Verrier MC. The CB&M employs tasks that are frequently found in community settings to determine "high level" balance and mobility impairments. (17). The test consists of 13 tasks, with 6 tasks performed on each side, forming a comprehensive performance assessment. The scoring scale varies based on the task, with scores ranging from 0 to 5, where 0 represents a complete inability to perform the task and 5 indicates the task is completed as successfully as possible. The highest possible score is 96, and scoring is based on the initial trial of each item. Tasks are designed to reflect increasing levels of difficulty. Except for item 12, which involves descending stairs and may be performed using a cane, all tasks must be completed without the use of ambulation aids, although orthotics are permitted. This performance-based test employs a 6-point scale to evaluate the 13 items.

- ✓ Unilateral stance
- ✓ Tandem walking
- ✓ 180° tandem pivot
- ✓ Lateral foot scooting
- ✓ Hopping forward
- ✓ Crouch and walk
- ✓ Lateral dodging
- ✓ Walking & looking
- ✓ Running with controlled stop
- ✓ Forward to backward walking
- ✓ Walk, look and carry
- ✓ Descending stairs
- ✓ Step-ups x 1step

➢ *Psychometric Properties*

- *Inter-Rater Reliability:*

Research indicates excellent inter-rater reliability, with Intraclass Correlation Coefficients (ICCs) generally above 0.9. This suggests that different examiners can reliably use the scale and achieve consistent results.

- *Test-Retest Reliability:*

The CB&M has also shown strong test-retest reliability (ICCs > 0.9), indicating that scores remain stable over time when a patient's condition has not changed.

➢ *Procedure*

Children with cerebral palsy aged 13 to 18 years were selected to participate in this study based on specific inclusion and exclusion criteria. Written consent forms were obtained from the participants to confirm their willingness to participate. The Community Balance and Mobility Scale (CB&M) was used as the primary outcome measure to assess balance. A total of 10 children were included in the study based on their diagnosis. The intervention consisted of sessions lasting 45 minutes, conducted 3 days a week for a duration of 8 weeks. Post-test measures were administered following the intervention period, and data analysis was subsequently performed.

➢ *Intervention Protocol*

The treatment protocol developed for this study is modified which includes a series of exercises for rehabilitation divided according to the functional goals to be pursued. Each of these goals includes a series of about 2 games-based activity .This protocol provides treatment for 45 mins/session; 3 sessions/ week; total 24 sessions/8 weeks.

Table 1 Intervention Protocol

Week	Activity Type	Duration	Description	Device Interaction
	UPPER EXTRIMITY FLASHFIT (I WALL)	20	Introduce the device, explain their functionalities, and demonstrate basic activities	Stand in front of IWALL and keep tracking and use hands to touch on the moving green light.

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1-8	Rest	5	Provide a rest period with hydration.	None
	LOWER EXTRIMITY FLASHFIT (I FLOOR)	20	Introduce the device, explain their functionalities ,and demonstrate basic activities	Stand on legs apart and keep tracking and use foot to step on the moving green light on the floor.

IV. RESULTS

Table 2 Descriptive Statistics of the Age Group of Patients.

Age	Frequency	Percentage	Mean ± SD	Min - Max
Less than 15	5	50.0	14.90 ± 1.663	13 - 17
Above 15	5	50.0		
Total	10	100.0		

The age group of the individual with cerebral palsy chosen for the study range from 13 to 18 years ,constituting a mean value of age 14.90 with standard deviation of 1.663.

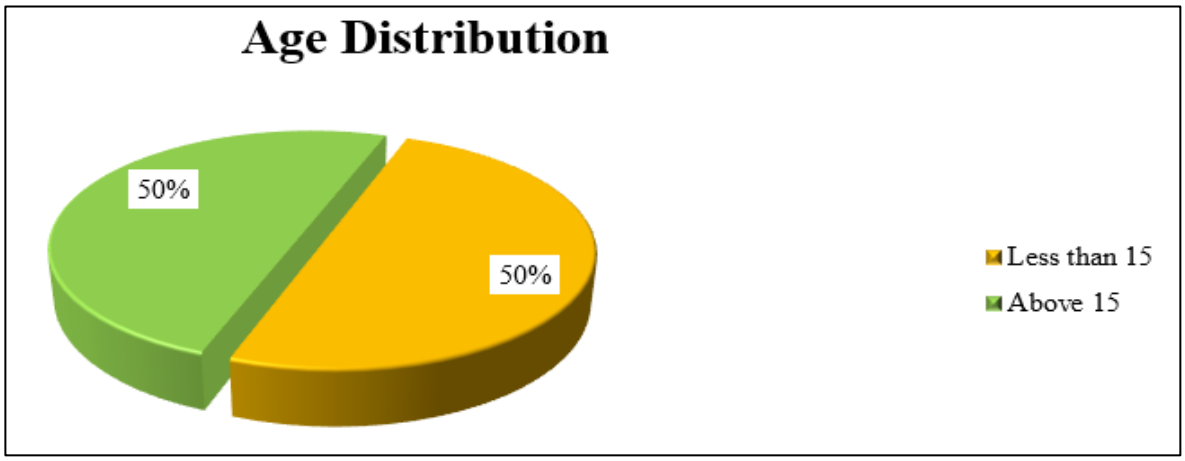

Fig 3 Descriptive Statistics of the Age Group of Patients

Table 3 Number of Males and Females Participated in the Study.

Gender	Frequency	Percentage
Male	9	90.0
Female	1	10.0
Total	10	100.0

A total of 10 individuals with cerebral palsy participated in this study ,including 9 males and 1female ,constituting the 90.0 % and 10.0 % of the population respectively.

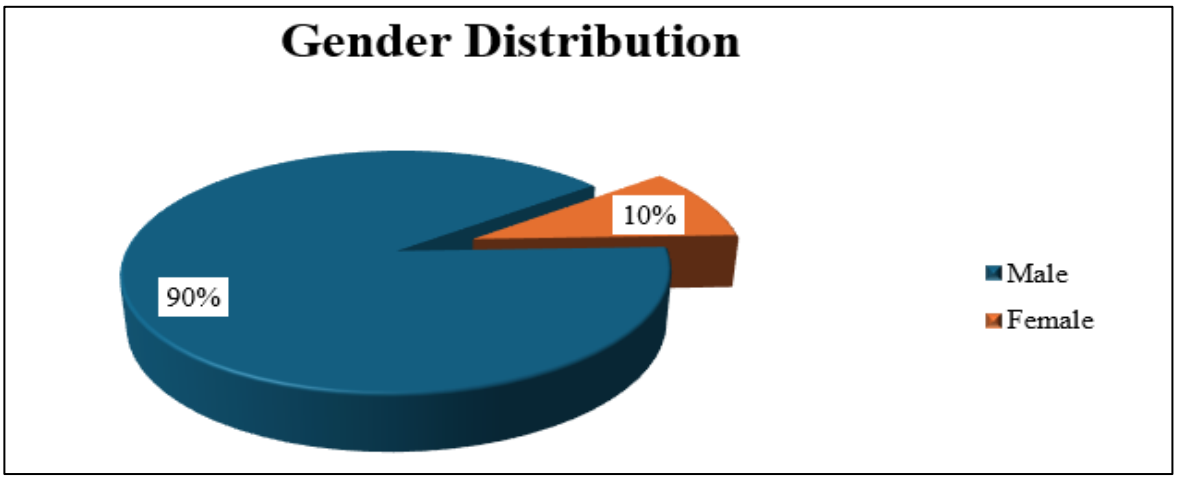

Fig 4 Descriptive Statistics of Gender Distribution Number of Males and Females Participated in the Study

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Table 4 Comparing Pre and Post -Test Score.

Community Balance and Mobility Scale	Pre-Test		Post-Test	
	Frequency	Percentage	Frequency	Percentage
Sever Impairment	10	100.0	9	90.0
Moderate Impairment	0	0.0	1	10.0
Mild or No Impairment	0	0.0	0	0.0
Total	10	100.0	10	100.0

The community balance and mobility scale (CB&M) pre-test scores indicated severe balance impairments in all participants, with a mean score of 16.60 (SD = 7.15). After the intervention, post-test scores improved significantly to a mean of 28.20 (SD = 7.50). The statistical significance of this improvement was confirmed by the Wilcoxon Signed Rank test (Z = -2.814, p = 0.005). This suggests that FLASHFIT is an effective tool for enhancing balance in individuals with cerebral palsy.

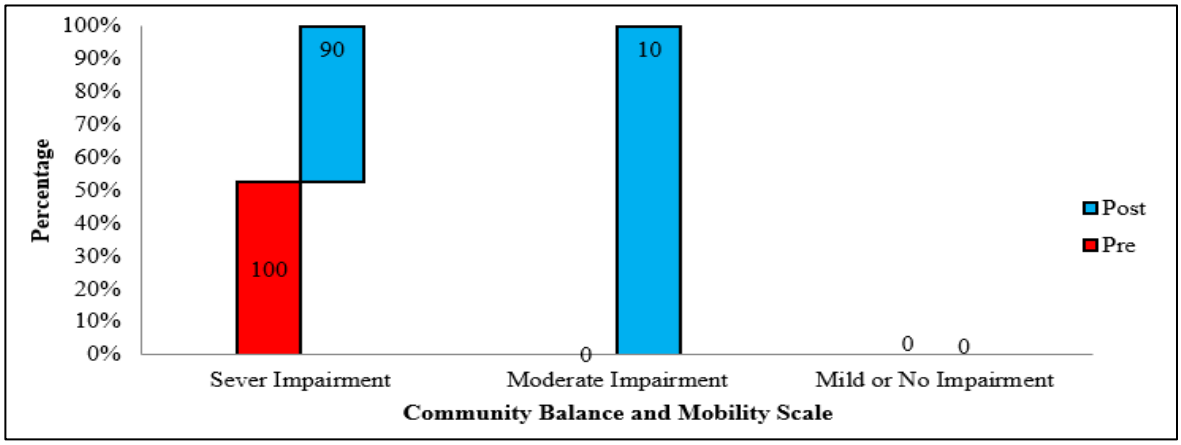

Fig 5 Comparing Pre and Post -Test Score

Wilcoxon Signed Rank Test was performed to compare the Pre and Post test scoring regarding Community Balance and Mobility Scale at 5% level of significance was observed.

Table 5 Comparing Pre and Post -Test Score of Community Balance and Mobility Scale

Community Balance and Mobility Scale	Mean	N	Std. Deviation	Z – Value (P - Value)
Pre -Test	16.60	10	7.152	-2.814
Post -Test	28.20	10	7.495	(0.005) *

* Indicates Statistically Significant

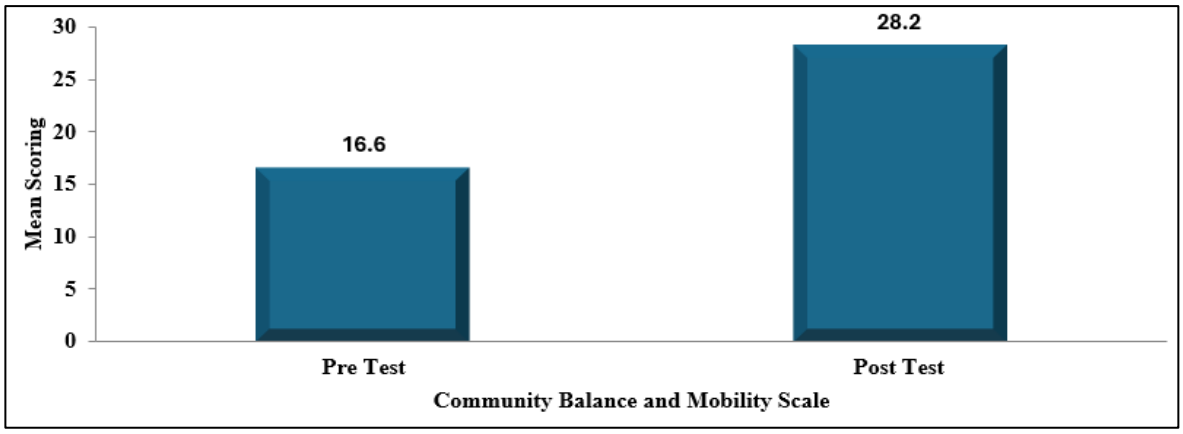

Fig 6 Comparing Pre and Post -Test Score of Community Balance and Mobility Scale

- *Interpretation:*

The above table shows that there is Significance difference between the Pre and Post test scoring regarding Community Balance and Mobility Scale.

Mann Whitney U - Test was performed to compare the Age and Community Balance and Mobility Scale in Pre and Post test scoring at 5% level of significance was observed.

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Table 6 Comparison of Pre and Post-Test Scores Between Age and Community Balance and Mobility Scale.

Age		N	Mean	Std. Deviation	Z – Value (P - Value)
Pre	Less than 15	5	12.60	2.881	-1.681 (0.093)
	Above 15	5	20.60	8.173	
Post	Less than 15	5	22.60	2.302	-2.611 (0.009) *
	Above 15	5	33.80	8.000	

* Indicates Statistically Significant

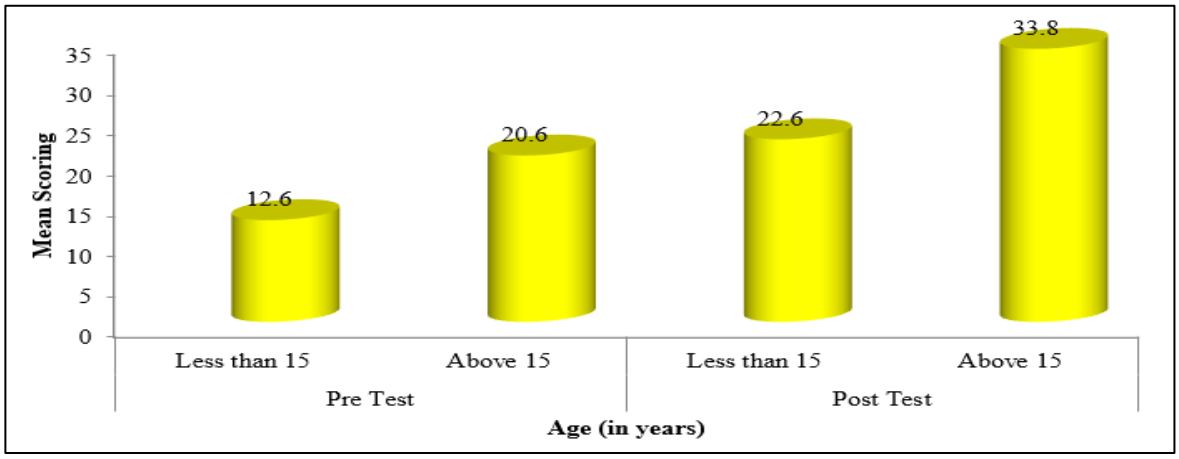

Fig 7 Comparison of Pre and Post-Test Scores Between Age and Community Balance and Mobility Scale.

➢ *Interpretation:*

The above table shows that there is No Significance difference between the Age and Community Balance and Mobility Scale regarding pre- test scoring.

The above table shows that there is Significance difference between the Age and Community Balance and Mobility Scale regarding post- test scoring.

Mann Whitney U - Test was performed to compare the Gender and Community Balance and Mobility Scale in Pre and Post test scoring at 5% level of significance was observed.

Table 7 Comparison of Pre and Post-Test Scores Between Male and Female.

Gender		N	Mean	Std. Deviation	Z – Value (P - Value)
Pre	Male	9	16.56	7.585	-0.350 (0.726)
	Female	1	17.00	0.	
Post	Male	9	27.89	7.881	-0.522 (0.602)
	Female	1	31.00	0.	

* Indicates Statistically Significant

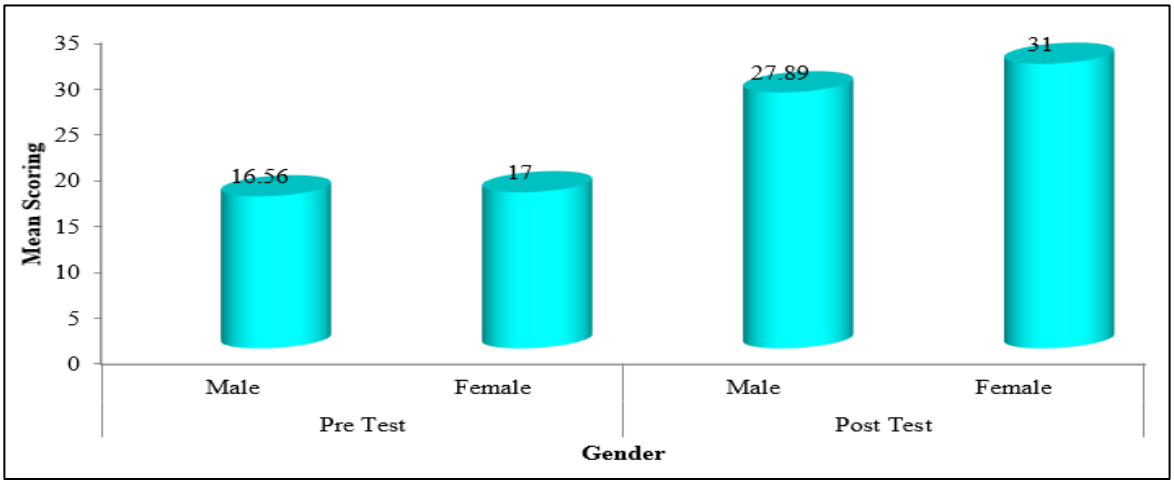

Fig 8 Comparison of Pre and Post-Test Scores Between Male and Female.

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➢ *Interpretation:*

The above table shows that there is No Significance difference between the Gender and Community Balance and Mobility Scale regarding pre and post-test scoring.

V. DISCUSSION

This study aimed to evaluate the effectiveness of the interactive device FLASHFIT in improving balance among individuals with cerebral palsy (CP) using the Community Balance and Mobility Scale (CB&M). A quasi-experimental design was employed with 10 participants (9 males, 1 female) aged 13-18 years. The intervention involved 24 sessions over 8 weeks, with each session lasting 45 minutes. Results were analysed using Wilcoxon Signed Rank and Mann-Whitney U tests.

➢ *Table 1: Descriptive Statistics of the Age Group of Patients:*

Table 1 explain that the participants in the study were individuals with cerebral palsy, with ages ranging from 13 to 18 years, and a mean age of 14.90 years (SD = 1.663), with an even distribution of 5 participants (50%) less than 15 years old and 5 participants (50%) above 15 years old.

➢ *Table 2: Number of Males and Females Participated in the Study:*

Table 2 explain that the total of 10 individuals with cerebral palsy participated in this study, comprising 9 males (90.0%) and 1 female (10.0%), indicating a predominantly male population in the study sample.

➢ *Table 3: Comparing Pre and Post -Test Score:*

Table 3 represents the classification of participants based on their Community Balance and Mobility Scale (CB&M) scores before and after the intervention. All 10 participants (100%) exhibited severe impairment in balance, as indicated by their pre-test scores. No participants fell into the categories of moderate impairment or mild/no impairment. Following the intervention, 9 participants (90%) remained in the severe impairment category, while 1 participant (10%) improved and moved into the moderate impairment category. No participants were categorized as having mild or no impairment.

The intervention may have been tailored to address the specific balance impairments and goals of the participant who improved, leading to more effective and efficient improvement and the participant who improved may have been more engaged and motivated during the intervention, leading to better outcomes . (15)

➢ *Table 4: Comparing Pre and Post -Test Score of Community Balance and Mobility Scale*

Table 4 represents the pre-test and post-test results of the Community Balance and Mobility Scale (CB&M) for the study participants. The mean CB&M score before the intervention was 16.60, with a standard deviation of 7.152, indicating severe balance impairment among the participants. After the intervention, the mean CB&M score increased to 28.20, with a standard deviation of 7.495, reflecting significant improvement in balance. The Wilcoxon Signed Rank Test revealed a statistically significant difference between pre-test and post-test scores, with a Z-value of -2.814 and a p-value of 0.005 ($*p < 0.05$).

The significant improvement in balance as measured by the Community Balance and Mobility Scale (CB&M) can be attributed to the interactive-based intervention, which likely incorporated key elements such as participant engagement, personalized feedback, task-oriented training, and sensory integration, promoting active participation, motivation, and better outcomes. (16)

➢ *Table 5: Comparison of Pre and Post-Test Scores Between Age and Community Balance and Mobility Scale:*

Table 5 presents the pre-test and post-test results of the Community Balance and Mobility Scale (CB&M) based on the participants' age groups (less than 15 years and above 15 years). Participants aged less than 15 years had a mean score of 12.60 with a standard deviation of 2.881. Participants aged above 15 years had a mean score of 20.60 with a standard deviation of 8.173. The Mann-Whitney U Test revealed no statistically significant difference in pre-test scores between the two age groups ($Z = -1.681$, $p = 0.093$). Participants aged less than 15 years showed a mean score of 22.60 with a standard deviation of 2.302. Participants aged above 15 years had a mean score of 33.80 with a standard deviation of 8.000. A statistically significant difference was observed between the post-test scores of the two age groups, as indicated by the Mann-Whitney U Test ($Z = -2.611$, $p = 0.009$, $*p < 0.05$).

The above result said that above 15 years age group participants have more improvement than below age 15 because, older participants may have had more developed neural pathways, allowing them to better adapt to the intervention, participants over 15 years may have had more advanced cognitive abilities, enabling them to better understand and implement the intervention strategies and they have more developed motor control systems, allowing them to better execute the movement patterns required by the intervention. (16) (17)

➢ *Table 6: Comparison of Pre and Post-Test Scores Between Male and Female:*

Table 6 summarizes the pre-test and post-test results of the Community Balance and Mobility Scale (CB&M) based on participants' gender (male and female). Male participants ($n = 9$) had a mean CB&M score of 16.56 with a standard deviation of 7.585. The lone female participant had a mean score of 17.00 with no variation (standard deviation = 0). The Mann-Whitney U Test showed no statistically significant difference between the pre-test scores of males and females ($Z = -0.350$, $p = 0.726$).In post-test male participants showed an improvement, with a mean score of 27.89 and a standard deviation of 7.881 and the female participant had a mean score of 31.00, with no variation (standard deviation = 0). The Mann-Whitney U Test indicated no statistically significant difference between the post-test scores of males and females ($Z = -0.522$, $p = 0.602$).

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The intervention may have provided equal opportunities for learning and improvement, regardless of gender. Males and females may have had similar cognitive abilities, enabling them to benefit equally from the intervention. The intervention's design may have been effective in promoting learning and improvement, regardless of gender. (18) (19) .

The results of this study demonstrate that the use of the interactive device, "Flashfit", significantly improved balance among individuals with cerebral palsy (CP), as evaluated by the Community Balance and Mobility Scale (CB&M).

VI. CONCLUSION

The study demonstrated that "Flashfit" significantly improved balance in individuals with cerebral palsy, with CB&M scores increasing from 16.60 (pre-test) to 28.20 (post-test), showing a statistically significant improvement ($p = 0.005$). Age was found to influence outcomes, as participants above 15 years achieved higher post-test scores (33.80) compared to those below 15 years (22.60), with this difference being significant ($p = 0.009$). Gender had no significant effect, as both males (27.89) and the single female participant (31.00) showed similar improvements. Overall, the findings suggest that "Flashfit" is effective in improving balance in individuals with cerebral palsy, with greater benefits observed in older participants regardless of gender.

VII. LIMITATIONS

- More number of sample size could have been taken for this study.zss
- The study may have a gender bias, as the sample may not be equally representative of both males and females.

RECOMMENDATIONS

- Conducting longitudinal studies to evaluate the sustained effects of "Flashfit" on balance over time could provide deeper insights.
- Include a control group to better assess the specific effects of "Flashfit" compared to traditional rehabilitation methods or no intervention.
- Compare "Flashfit" with other interactive devices or traditional balance rehabilitation methods to identify its unique benefits.

REFERENCES

[1]. PT ASCP. Effect of balance training on recovery of stability in children with cerebral palsy. Development Medicine & Child Neurology. 2007;591-602.
[2]. Burtner PA,QC,&WMH. Reactive Balance in Children with Cerebral Palsy. Developmental Medicine & Child Neurology, 40(10). 1998;661-667.
[3]. Nashner LM,SCA,&MO. Postural Muscle Responses and Balance Control in Children with Cerebral Palsy. Physical Therapy, 63(10). 1983;1518-1524.
[4]. Himmelmann K,UP,&HM. Cerebral palsy: epidemiology, pathophysiology, and rehabilitation. Journal of Neurology, Neurosurgery, and Psychiatry. 2017;831-838.
[5]. Krigger KW. Cerebral Palsy: An Overview. American Family Physician. 2006;91-100.
[6]. Sankar MJ ea. Prevalence of cerebral palsy in urban and rural areas of India: A systematic review and meta-analysis. Pediatrics and Neonatology. (2019).
[7]. Kemp M ea. Prevalence of cerebral palsy in a rural district of Tamil Nadu, India. Indian. Indian Journal of Pediatrics.2018.
[8]. Horak FB. Clinical Measurement of Postural Control in Adults. Physical Therapy. 1987;1881-1885.
[9]. Bannister RA. The Nature of Postural Control. American Physical Therapy Association (APTA). 1969;927-933.
[10]. Sullivan KJ. Balance and Vestibular Rehabilitation: Clinical Practice and Scientific Foundation. F.A. Davis Company. 2014;1-17.
[11]. Kafy SMESaEMAE. Effect of balance training on postural balance control and risk of fall in: Disable Rehabil; 2014.
[12]. Nandhini Varsha A PBDURKaDm. A study on the effectiveness of interactive flashfit devices on improving sports performance in badminton. International Journal of Physical Education, Sports and Health. 2023;530-535.
[13]. Darcy Fehlings MD MF. Interactive Computer Play as "Motor Therapy" for Individuals with Cerebral Palsy: Seminars in Pediatric Neurology; 2013.
[14]. JA Howe EIV. The Community Balance and Mobility Scale a balance measure for individuals with traumatic: SAGE Publications; 2006.
[15]. Antoni Jaume-i-Capó PMBBMAaJV. Interactive Rehabilitation System for Improvement of: IEEE TRANSACTIONS ONNEURALSYSTEMSANDREHABILITATIONE NGINEERING; 2014.
[16]. Brenda Hanna-Paddy AM. The relation between instrumental musical activity and cognitive aging. Neuropsychologic. 2011;322-333.
[17]. Shumway-Cook A,&WMH. Motor Control: Translating Research into Clinical Practice. Lippincott Williams & Wilkins. 2017;624 pages.
[18]. Deanna Kuhn MP. Do children and adults learn differently? Journal of Cognition and Development. 2006; 71-94.
[19]. Janet Shibley Hyde NMM. Gender differences in mathematics and science: A meta-analytic review. Journal of Educational Psychology. 1997;251-263.
[20]. Brenda Hanna-Paddy AM. The relation between instrumental musical activity and cognitive aging. Neuropsychologic. 2011;322-333.