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Effect of structured exercise program on fundamental motor skills in children with Down syndrome: A randomized controlled trial

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ABSTRACT

Background: Down syndrome (DS) is one of the most common chromosomal abnormalities, and it has a deficiency in fundamental motor skills (FMS).

Objective: This study aimed to determine how a structured exercise program impacted children with Down syndrome's fundamental motor skills.

Materials and methods: This study was conducted in a randomized controlled trial at the School for Disabled Children, Yangon. Thirty participants (15 in each group) with DS were divided into the experimental and control groups. The experimental group participated in a structured exercise program (focusing on stability, object control skills, and locomotor skills) for six weeks, while the control group did artistic and recreational activities (singing, dancing, drawing, and coloring). Lower extremity functional strength (five times sit-to-stand test), static balance (modified Stroke test), and FMS proficiency (TGMD-2) were assessed by blinded assessors at the start of the intervention, three weeks later, and six weeks later. Independent sample t-tests and repeated measure ANOVA were used to compare the two groups and within each group.

Results: Post-test analyses of all outcome measures between the two groups revealed statistically significant differences. In the third- and sixth-weeks following intervention, the FMS, static balance, and lower extremity functional strength were significantly higher in the experimental group than in the control group.

Conclusion: The current study's findings highlight that a structured exercise program focused on FMS can be applied in educational and clinical settings to improve the FMS of children with DS.

Introduction

Individuals with Down syndrome (DS) often delay developing fundamental motor skills (FMS), such as locomotor skills, object control skills, and stability skills, which are the building blocks for more complex, specialized movements and sport-specific skills.[1,2] Children with DS may have phenotypic characteristics such as hypotonia, joint laxity, balance dysfunctions, and incoordination, making it more difficult to perform these activities.[3,4] These phenotypic features led to compensatory movement patterns in acquiring FMS.[5,6] Many muscles or muscle groups need to be activated to perform the FMS, which is crucial for children's cognitive, social, and psychological development.[1,7,8]

The FMS is the foundation for the successful performance of sporting and physical activities and socialization in later life.[1,9] The children will be delayed in

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developing more complex, specialized, and sports-specific skills if they are deficient in the FMS.[1] Proficiency in the FMS has been identified as a major contributing factor to improving physical activity,[9-11] physical fitness,[12] a healthy weight,[13] and mastering more complex motor skills for present and advanced age.[11,14] Furthermore, the FMS correlates with lifetime involvement in physical activity, which is essential to maintain physical health and support cognitive and social development during childhood.[15] Therefore, every child had to be proficient in their FMS. Even so, the number of children with FMS deficiency was still growing, mainly among children with special needs. In addition, a recent systematic review stated that the FMS level of 6- to 10-year-old TDC around the globe was "below average" when compared with normative data from Ulrich's TGMD-2.[16]

Previous research recommended that FMS would need to be taught and trained by children to achieve proficiency in these skills because their development is not a natural process. The currently available literature has highlighted that free play will not contribute to the FMS.[8,17] Therefore, sufficient practice opportunities, intervention programs, and quality instructions and feedback are vital to enhance FMS proficiency.[8]

Several studies, systematic reviews, and meta-analyses concerning children and youth with typical development,[8,17-21] children with developmental coordination disorder (DCD),[22] and youth with intellectual disabilities (ID)[23] have approved that motor skill training effectively enhances their FMS. These studies have examined TDC, children with DCD, and ID. Indeed, studies are still needed to explore the effect of motor skill intervention on the FMS in children with DS, according to our knowledge. In this study, the researchers attempted to implement a structured exercise program as an intervention to enhance FMS. The intervention program is based on theoretical literature and several previous studies that have successfully implemented intervention programs. Moreover, the design aimed to improve the FMS of children with DS, aged 7 to 10 years, by focusing on three FMS domains: locomotor, object control, and stability skills.

A structured exercise program has not been proven to have any positive effects on the FMS of children with DS in Myanmar. However, numerous studies are being done on FMS training in TDC and children with special needs. Additionally, research into physical therapy treatments for people with DS is growing. However, there are still many important issues about how structured exercise programs enhance FMS proficiency in children with DS, and their findings are slightly contradictory. Most physical therapy treatments for children with DS also focus on improving physical fitness, strength, endurance, and balance. A systematic physical therapy program was still required to raise the FMS proficiency of DS children in Myanmar. Therefore, the objective of the current study was to assess how a structured exercise program improved DS children's FMS proficiency.

Materials and methods

This randomized controlled trial was conducted at the School for Disabled Children (SDC), Yangon, and included 30 children with DS (22 boys and 8 girls). The participants, diagnosed with DS by their pediatrician, could follow two-step commands considered inclusion criteria. The participants who met the exclusion criteria had severe neurological, medical, and musculoskeletal problems. The principal, the classroom teachers, the children with DS, and their parents or guardians at the SDC, Yangon, were invited to participate in this study. Afterward, the participant was chosen and provided an in-depth verbal and written explanation of the study's objectives, methodologies, advantages, and safety precautions. Then, all parents and guardians gave their written and informed agreement, and all participants gave verbal assent. The Institutional Review Board (IRB) of the University of Medical Technology, Yangon, granted ethical approval (ethical approval number IRB/UMTY/2-2020/002). The study followed the rules set by the Consolidated Standards of Reporting Trials (CONSORT) and was registered with the Thai Clinical Trials Registry (TCTR20230129001). Figure 1 displays the CONSORT flow diagram of the investigation.

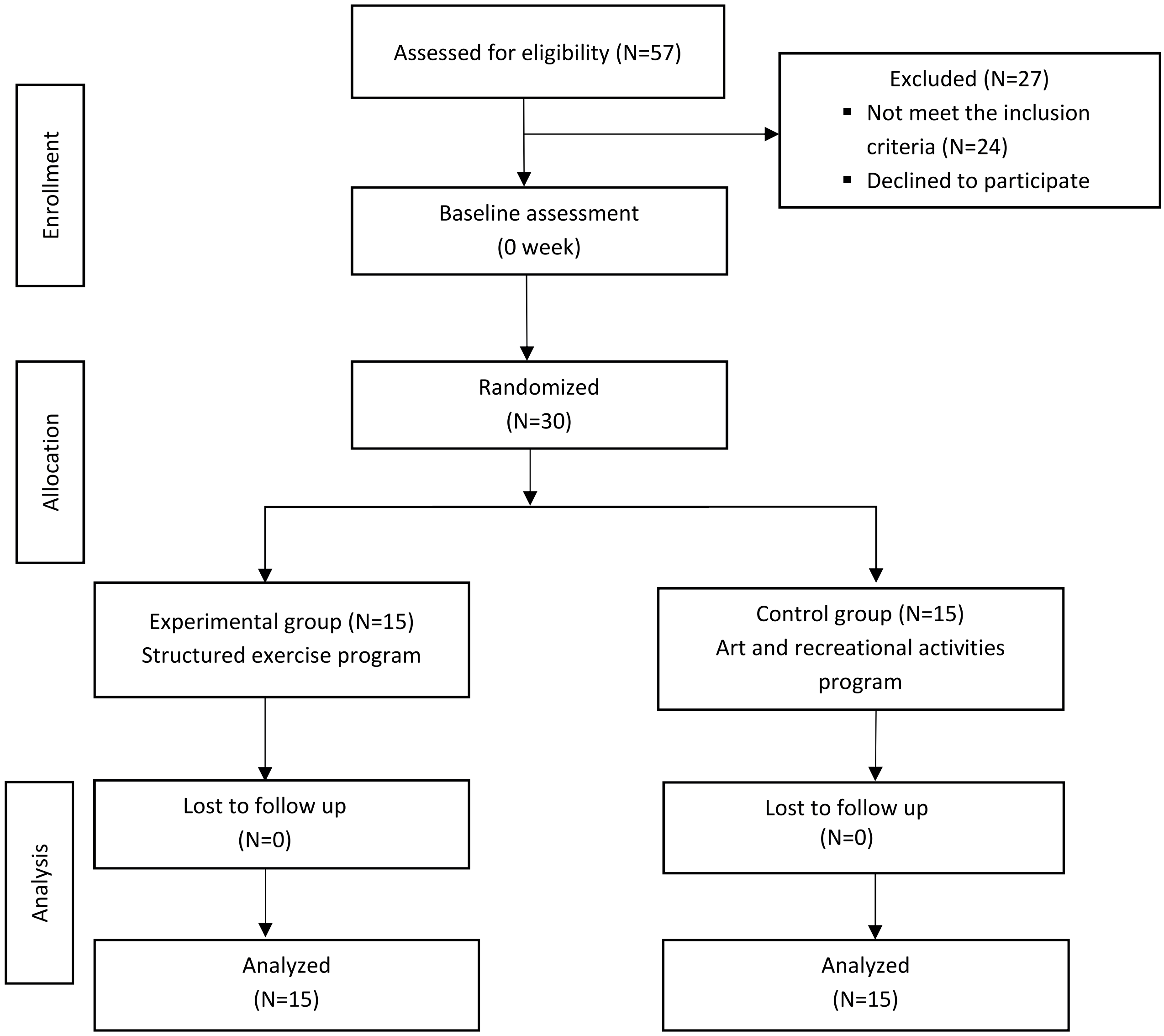

Figure 1. *The CONSORT flow diagram of children with Down syndrome recruitment.*

Children with DS were stratified by sex to ensure that the experimental and control groups involved equal numbers of boys and girls. Three permuted blocks of 10 participants were created using a computer-generated program to allocate children with DS into two trial arms. The participants were allocated via the sequentially numbered opaque sealed envelopes (SNOSE) and assigned a class teacher. The principal researcher and one research assistant gave the experimental group, and two research assistants provided the control group. Another two research assistants served as blind assessors for the outcome measures.

In the experimental group, the participants were given a structured exercise program (stability, object control skills, and locomotor control skills). It was developed and contained 24 exercises and activities in a functional, goal-oriented approach for FMS proficiency. Physiotherapists commonly prescribe these exercises in pediatric rehabilitation. Exercises and activities were categorized and arranged into steps (I and II) based on task complexity and balancing challenging activities. Each step was comprised of 12 exercises that were related to playing activities and improving FMS proficiency. Step I; exercises and activities were performed in the first three weeks, and Step II; exercises and activities were performed in the next three weeks, respectively. These activities were divided into three parts: warming up (5 minutes), structured exercises (40 minutes), and cooling down (5 minutes), and the total exercise duration lasted approximately 50 minutes for each session. Furthermore, skill instruction, practice, set-up, and explanation for activities lasted for 15 minutes. The comprehensive depiction of the structured exercise program is outlined in Supplementary Table 1.

Table 1. Demographic characteristics of experimental and control groups.

Demographic characteristics	Experimental group (N=15)	Control group (N=15)	*p* value
Mean age (years)	9.27±1.03	9.33±0.97	0.85
Mean age (months)	119.87±14.35	120.47±14.20	0.90
Mean height (cm)	128.35±12.47	123.21±12.78	0.27
Mean weight (kg)	38.47±9.12	32.026±8.40	0.06
Mean BMI (kg/m^2)	23.04±2.65	20.87±3.26	0.06
Mean BMI percentiles	94.16±3.53	83.46±25.61	0.31
Weight status according to BMI percentiles			
Underweight (<5th percentile), N (%)	0	0	-
Healthy weight (5th - <85th percentile), N (%)	1 (6.7%)	0	
Overweight (85th - <95th percentile), N (%)	7 (46.6%)	7(46.6%)	
Obese (≥95th percentile), N (%)	7 (46.6%)	8 (53.4%)	
Gender			
Boy, N (%)	11 (73.3%)	11 (73.3%)	-
Girl, N (%)	4 (26.7%)	4 (26.7%)	

Note: Significant difference tested by independent sample t test.

In the control group, the participants were given an art and recreational activities program (singing, dancing, drawing, and coloring). Each session in the control group also lasted for around 50 minutes, which is equivalent to the duration of the sessions in the experimental group. The participants in both groups were informed of the details of the intervention program. Each program was scheduled for 6 weeks with 3 sessions per week (18 sessions). These exercises and activities were performed in groups containing five participants. Participants in both groups were given similar warm-up and cool-down activities. These activities were conducted separately.

The primary outcome measure was the test for gross motor development second edition (TGMD-2), and the secondary outcome measures were the modified stork test and the five times sit-to-stand test (FTSTS). The inter-rater agreement (between the principal investigator and the blinded assessor) of outcome measures was also explored before starting the assessment. The inter-rater reliability of TGMD-2 was found to be excellent, as shown by the high Cronbach's alpha and intra-class correlation coefficient (ICC) values. The ICC for the GMQ was 0.96, while the raw scores for locomotor and object control were 0.97 and 0.97, respectively.[24] The inter-rater reliability of the modified Strok test and five times sit-to-stand test was 0.89 and 0.86, respectively. All outcome measures were taken at baseline, the third week after, and the sixth week after intervention by the blinded assessors. The physiotherapist scored the TGMD-2, and the principal researcher recorded the video. The secondary outcome measures were assessed by the class teacher from the SDC. Both the assessors and participants were blinded to the participants' intervention groups.

The static balance of the participants was assessed using a modified Stork test. The participants stood with one leg on the flat floor, and the other was lifted above the ankle joint with the arms at the sides (Figure 2). The participants had to perform once for each leg, and the time (seconds) was recorded using a stopwatch. The reliability and objectivity of this test were 0.87 and 0.99, respectively.[25]

Figure 2. *Modified Stork test.*

Using a stopwatch, the FTSTS measured the time (seconds) required to complete five successive sit-to-stand-to-sit cycles as quickly as possible. A chair with no armrest was used, and the barefoot test was done on a floor (Figure 3). A child was instructed to sit with their arms folded across their chest and their back against the chair, stand up and sit down as quickly as possible five times. The FTSTS is a functional lower limb muscle strength measurement with excellent reliability in children with spastic diplegic cerebral palsy.[26]

Figure 3. *Five times sit-to-stand test.*

The FMS assessment process followed the TGMD-2's standard operating procedures. The performance criteria for the TGMD-2 were 3-5, comprising 12 skills (six locomotor and six object control skills). The participants received a score of 1 if they were successful in doing the skill and a score of 0 if they were unsuccessful. A skill score was calculated by adding the sum of the performance criteria's total criterion scores. The six skill scores were added to get the raw subtest scores. The locomotor and object control skills subtest had a maximum raw score of 48. The subtest's raw score was changed for the locomotor and object control standard scores. In addition, the subtest standard scores were totaled up and converted into the gross motor quotient (GMQ); the maximum was 160. This test had excellent reliability and validity.[7]

The statistical analysis was conducted using the Statistical Package for the Social Sciences software version 25.0 for Windows (SPSS, Inc. Chicago, IL, USA). The Shapiro-Wilk test was used to test whether the data were normally distributed. Descriptive statistics, independent samples t-tests, and repeated measure ANOVA were used to verify the differences between and within groups and the group-by-time interaction effects of interest. The effect sizes between groups were determined using partial eta squared (η_p^2), with values of less than 0.10, between 0.10 and 0.06, and greater than 0.14, which were categorized as small effect size, medium effect size, and large effect size, respectively.[27] The Bonferroni correction was employed for conducting post hoc pairwise comparisons. An independent t-test was used to compare the groups' significant differences in the mean score. A $p<0.05$ was considered statistically significant.

Results

There was no statistically significant difference between the mean scores of the two groups in demographic characteristics such as age and BMI percentiles, as shown in Table 1.

To examine the effects of time and group as well as the interaction effect of time and group on FMS (TGMD-2), a two-way mixed repeated measure ANOVA was conducted, and the detailed results are shown in Table 2.

Table 2. Comparison of FMS within each group among baseline, 3rd week, and 6th week after intervention between experimental and control groups.

FMS	Groups	Baseline Mean±SD	3rd week Mean±SD	6th week Mean±SD	*p* value[a]	*p* value[b]	*p* value[c]
LSS	Experimental	1.80±1.37	5.00±1.51	8.80±1.85	<0.001	<0.001	<0.001
	Control	2.00±1.36	2.07±1.48	2.27±1.87	1.00	0.566	0.493
	p value[d]	0.692	<0.001	<0.001			
OCSS	Experimental	2.33±1.79	6.07±2.52	9.07±1.43	<0.001	<0.001	<0.001
	Control	2.00±1.41	2.00±1.41	2.13±1.76	-	1.000	1.000
	p value[d]	0.577	<0.001	<0.001			
GMQ	Experimental	52.60±7.53	73.20±10.84	93.60±8.47	<0.001	<0.001	<0.001
	Control	52.00±7.52	52.20±7.89	53.20±10.19	1.000	0.713	0.566
	p value[d]	0.829	<0.001	<0.001			

***Note**: Pairwise comparison tested by Bonferroni Post hoc test at p<0.05, Within-group comparisons; a: comparison of FMS between baseline and 3rd week after intervention, b: comparison of FMS between 3rd week and 6th week after intervention, c: comparison of FMS between baseline and 6th week after intervention, Between-group comparison; d: comparison of FMS between experimental and control groups, FMS: fundamental motor skills; LSS: locomotor standard score; OCSS: object control standard score; GMQ: gross motor quotient.*

The significant effect of time (F[2,56]=187.38, *p*<0.001, effect size=0.87) and the considerable influence of group (F[1,28]=32.85, *p*<0.001, effect size=0.54) were found for FMS (TGMD-2: LSS). Furthermore, the effects of time and group LSS interacted to produce a score of (F[2,56]=160.60, *p*<0.001, effect size=0.85). For FMS (TGMD-2: OCSS), a significant effect of time (F[2,56]=93.45, *p*<0.001, effect size=0.76), and a significant effect of group (F[1,28]=42.85, *p*<0.001, effect size=0.61), were found. Likewise, there was an interaction effect of time and group (F[2,56]=86.61, *p*<0.001, effect size=0.76) on the OCSS. A significant effect of group (F[1,28]=48.03, *p*<0.001, effect size=0.63) and a significant effect of time (F[2,56]=193.98, *p*<0.001, effect size=0.87) were found for FMS (TGMD-2: GMQ). Additionally, there was a time-group interaction impact on the GMQ score (F[2,56]=172.57, *p*<0.001, effect size=0.86).

Table 3 displays the results obtained from the analysis of balance and lower extremity functional strength among children with DS.

For static balance (right side), a significant effect of time (F[2,56]=240.71, *p*<0.001, effect size=0.89) was found, as well as a significant effect of group (F[1,28]=44.83, *p*<0.001, effect size=0.62). Likewise, there was an interaction effect of time and group (F[2,56]=182.94, *p*<0.001, effect size=0.86) on the balance score. Both a significant effect of time (F[2,56]=287.51, *p*<0.001, effect size=0.91) and a significant effect of group (F [1,28]=43.39, *p*<0.001, effect size=0.61) were discovered for static balance (left side). The interaction between time and group also had an impact on the balance score (F[2,56]=195.91, *p*<0.001, effect size=0.87).

Table 3. Comparison of static balance and strength within each group among baseline, 3rd week, and 6th week after intervention between experimental and control groups.

Variables	Groups	Baseline Mean±SD	3rd week Mean±SD	6th week Mean±SD	*p* value[a]	*p* value[b]	*p* value[c]
MST (Rt)	Experimental	6.33±1.04	8.00±1.19	14.07±1.79	<0.001	<0.001	<0.001
	Control	6.73±1.03	7.07±0.88	7.33±0.81	0.058	0.122	0.021
	p value[d]	0.301	0.022	<0.001			
MST (Lt)	Experimental	5.33±0.81	7.07±0.96	12.13±1.64	<0.001	<0.001	<0.001
	Control	5.67±0.90	6.13±0.83	6.40±0.63	0.011	0.311	0.009
	p value[d]	0.297	0.008	<0.001			
FTSTS	Experimental	16.93±1.62	15.67±1.71	11.33±1.29	0.094	<0.001	<0.001
	Control	17.33±1.58	16.87±1.72	16.73±1.75	0.011	1.000	0.008
	p value[d]	0.501	0.067	<0.001			

***Note**: Pairwise comparison tested by Bonferroni Post hoc test at p<0.05, *negative score in FTSTS test (seconds) means better improvement, Within-group comparisons; a: comparison of variables between baseline and 3rd week after intervention, b: comparison of variables between 3rd week and 6th week after intervention, c: comparison of variables between baseline and 6th week after intervention, Between-group comparison; d: comparison of variables between experimental and control groups, MST (Rt): modified Stork balance test (right side); MST (Lt): modified Stork balance test (left side); FTSTS: five times sit to stand test.*

Both a significant effect of group (F[1,28]=20.58, *p*<0.001, effect size=0.42) and a significant effect of time (F[2,56]=78.17, *p*<0.001) were reported for strength. The interaction between time and group also had an impact on the strength score (F[2,56]=55.11, *p*<0.001, effect size=0.66).

Discussion

This study has examined the effect of a structured exercise program on the FMS of children with DS after participating in a 6-week institutional-based, group-based, and fun-based exercise program. The structured exercise program was expected to be superior to the arts and recreational program. This study also showed that a structured exercise program can help children with DS improve their FMS performance, static balance, and lower extremity functional strength at all post-training assessments compared to baseline. Based on strong theoretical evidence, the current study confirmed a clear difference between a structured exercise program and art and recreational programs in a real-world setting.

The improved FMS performance of the children with DS in the experimental group was greater than that of the control group after the 3rd and 6th weeks of the intervention. Moreover, there were also significant differences in FMS (TGMD-2) between baseline and the 3rd week after the intervention and between the 3rd week and the 6th week after the intervention in the experimental group compared to the control group.

There are several possible explanations for these results. All exercises and activities in the experimental group were significant and specific tasks based on FMS domains with augmented feedback, quality instructions, and practice opportunities.[28,29] Additionally, the researcher and one research assistant trained the group of participants, emphasizing the skillful performance of FMS for 50 minutes and 10 minutes of instruction in a 1-hour training session, three sessions a week for six weeks in this study. During exercise training, the researcher and research assistant manually assisted or reinforced the participant with appropriate verbal or visual feedback to get the skillful performance of the FMS.

In this study, all participants in the experimental group received repetitive skilled training and quality feedback because of the supervised exercise therapy and reinforcement provided by the researcher and research assistant. In addition, a structured exercise program was performed in a group; therefore, all participants achieved the effects of group exercises, such as mutual encouragement and stimulation from other group members, and did not feel bored with the exercises.[30] Furthermore, exercises and activities were performed station by station; therefore, they could achieve a sense of achievement and completion. Therefore, all participants were physically healthy and had fun performing the exercises and activities. All these effects might enhance the FMS proficiency of participants. The enhancement in TGMD-2 scores was indicative of these effects.

These results align with previous studies, systematic reviews, and meta-analyses that investigated the effects of motor skills training in various study populations such as TDC,[8,17,20,31,32] children with DS,[33,34,] and children with ID.[23] These studies revealed that the various motor skill intervention programs significantly enhanced FMS levels among preschoolers, typically developing youth populations, and children with special needs after the intervention. The interventions were effective when the training programs lasted 5 to 24 weeks, and the training sessions were done three times a week for 20 to 30 minutes. Hence, the findings of this study further support that a 6-week (18-hour) structured exercise program effectively enhances FMS performance in children with DS.

The current study's results seemed consistent with other research, including the previous systematic review conducted by Maïano and coworkers in 2019. They reviewed the effects of a motor skill intervention program on FMS in individuals with ID. They found that the intervention programs positively enhanced balance and overall FMS in individuals with ID. Moreover, their findings also mentioned that a developmental physical education program, therapeutic sensorimotor training, and intensive motor skills training significantly advanced FMS proficiency among individuals with ID.[23]

Several systematic reviews and research studies stated that the motor skills interventions (various types and durations) significantly improved the FMS performances of TDC or children with special needs.[8,17,20,31,33,34] Thus, based on these results, the various motor skills training and exercise programs seem effective regardless of the intervention variants used, different training durations, and training sessions per week.

During the early childhood period, youngsters are most likely to be skilled in the FMS, and several studies have shown that FMS proficiency has significantly improved in the middle childhood and youth populations.[28,32] Moreover, it is crucial to introduce motor skill training as early as possible in children with or without disabilities.[16] According to the current systematic reviews, meta-analyses, and global level studies that confirmed that various FMS trainings have been shown to improve FMS at a young age significantly, these programs should be applied in different educational settings, such as primary schools and special schools, to enhance the FMS levels of children.16 The results of the present study further support the idea behind their findings and experiments.

This study's findings also support the value of structured exercise programs in increasing the static balance and lower extremity functional strength of children with DS. This may be because a structured exercise program consists of stability skills and weight-bearing exercises.

The results match those observed in earlier systematic reviews and experimental studies. A recent systematic review by Stander et al. stated that VRT combined with standard physiotherapy or occupational therapy interventions improved motor proficiency (balance, coordination, strength, and agility) in the DS population. They found that the balance and strength of the DS showed significant improvement after 6 weeks of the therapy program.[35] They also advised that it could be used in children with DS to improve balance, and the duration of the intervention is 5–24 weeks.[35]

The current study's findings are consistent with a previous systematic analysis of several balancing exercise regimens that improve balance in the DS population.[36] These reviews reported that the intervention group significantly improved the balance and strength of the children with DS. Therefore, the current study's findings broadly support the work of other studies in this area. Additionally, no serious adverse effects of the intervention were found in this study. Therefore, the structured exercise program used in the current study represents a safe and realistic form of intervention for children with DS.

The limitation is the small sample size and limited time in this study; there is no long-term follow-up of the participants. So, further recommendations for future studies must be made with a large group and extended follow-up periods. Lastly, the present study has shown the effectiveness of a structured exercise program based on objective outcome measures. Thus, further investigation using product outcome measures (e.g., velocity and distance of running) and technology-based measures (e.g., the Biodex Balance System for balance and the isokinetic dynamometer for strength) to explore the changes in DS is still required.

Conclusion

In conclusion, this study revealed that the structured exercise program impacted the lower extremities' FMS, static balance, and functional strength. The present study suggests that a structured exercise program has measurable effects on FMS proficiency, static balance, and lower extremity functional strength in children with DS. Furthermore, after 6 weeks (approximately 18 hours) of exercises and activities, a statistically significant improvement in FMS proficiency was found. Lastly, this study can support the use of a structured exercise program to improve FMS performance despite some limitations on the generalizability of the results. These findings can be applied as a practical standard and/or alternative use of structured exercises in routine treatment programs for physiotherapists, physical educators, and other health care professionals to improve the FMS performance of children with DS.

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Conflict of interest

There was no conflict of interest, according to the authors.

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Rerences

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Supplementary Table 1. Structured exercise program for the experimental group.

Components	Step I (first three weeks)	Step II (next three weeks)	Duration
Warming up	a) Introduction to group members with saying "Mingalarbar" and "Hand waving" b) Standing together in a group c) Clapping the hands and singing nursery rhyme together d) Marching together for 20 steps	As same as step I	5 minutes
Exercises and activities for stability	a) Walking up and down stepping foam (12-inch width x 12-inch length x 6-inch height) - 10 times b) Marching in place 10 repetitions for each leg c) Walking on balance beam (6-inch width × 144-inch length × 3-inch height) with hand support (to and fro 3 times) d) Walking along the straight line (2-inch width × 3 meters) (to and fro 3 times)	a. Walking up and down 3 step stairs - 5 times b. Walking on steppingstones with hand free. Set up steppingstone-scatter (To and fro x 3 times) c. Walking on balance beam (6-inch width× 144-inch length × 3-inch height) with hands holding the light plastic ball (to and fro 3 times) d. Walking, turning around the obstacles (5 cones × 12 inches between every two cones) (to and fro 3 times)	10 minutes
Exercises and activities for locomotor skills	a. Walking on the footprint forward direction - 10 steps (3 times) b. Jumping in hoops forward direction (2 feet diameter × 5 hoops) both feet together (to and fro 3 times) c. Running between two straight line (2 feet width×25 feet length) (to and fro 2 times) d. Hop in hoops with therapist's hand support (2 feet diameter × 5 hoops) 5 times for each leg	a. Walking on the footprint sideward direction - 10 steps (to and fro 3 times) b. Jumping in hoops sideward direction (2 feet diameter × 5 hoops) both feet together (to and fro 5 times) c. Running, turning around the obstacles (5 cones × 24 inches between every two cones × 25 feet length) (to and fro 2 times) d. Hop in hoops with hand free (2 feet diameter × 5 hoops) 5 times for each leg	15 minutes
Exercises and activities for object control skills	a. Throwing a bean bag to the target. Distance between starting point and target is 10 feet (5 times) b. Bowling: Roll bowling x 5 times. Distance between starting point and target is 10 feet c. Ball kicking: Running and kicking a stationary ball 5 times. Distance between stationary ball and target is 20 feet d. Playing Basketball: 4 bounces with one hand and catch with two hands x 5 times	a. Throwing a bean bag to the target. Distance between starting point and targets is 20 feet (5 times) b. Bowling: Roll bowling x 5 times. Distance between starting point and target is 20 feet c. Ball kicking: Running and kicking a stationary ball 5 times. Distance between stationary ball and target is 30 feet d. Playing Basketball: 4 bounces with one hand and catch with two hands and throw with two hands into overhead x 5 times	15 minutes
Cooling down	a. Self- stretching demonstrated by the researcher b. Singing Good-Bye songs	As same as step I	5 minutes