CHAPTER IV

RESULTS

1. Demographic data

Twenty children with cerebral palsy (CP) participated in this study, but eight participants (pairs of 7, 8, 9, and 10) were excluded from this study because two participants from each group missed follow-up appointment over 3 times, leading to two participants from each group not being paired. The percent of drop out was equal to 40%. Therefore, the reported data in this study is based on a sample size of 12 participants. Demographic characteristics of the participants in each group are given in Table 1.

Table 1 Demographics data of children with spastic cerebral palsy.

Participant	Age (yr)	Sex	Weight (kg)	Type of CP
Group A				
1	14	M	55	Diplegia
2	18	M	55	Hemiplegia
3	9	M	24	Diplegia
4	9	M	27	Diplegia
5	15	F	40	Diplegia
6	11	M	38	Hemiplegia
Mean ± SD	12.66±3.61		39.83±13.25	
Group B				
1	16	M	37	Diplegia
2	15	M	52	Hemiplegia
3	8	M	19.4	Diplegia
4	8	M	20	Diplegia
5	15	F	55.4	Diplegia
6	15	M	58	Hemiplegia
Mean ± SD	12.83±3.76		40.30±17.53	

Both groups consisted of four children with spastic diplegia and two children with spastic hemiplegia. The averaged age of Group A and Group B was 12.66±3.61 year and12.83±3.76year, respectively. The averaged weight of Group A and Group B was 39.83±13.25 kg and 40.30±17.53 kg, respectively.

2. Comparisons of %GMFM, MWS, and PCI between Groups A and B for pre-training

The averaged gross motor function during standing (%GMFM) at pre-training of Group A and Group B was 87.73±9.45% and 87.03± 10.21%, respectively. The averaged maximum walking speed (MWS) at pre- training of Group A and Group B were 46.04 ± 26.35 m/min and 47.65 ± 28.78 m/min, respectively. The averaged physiological cost index (PCI) at pre-training of Group A and Group B was 0.55±0.58 beats/m and 0.44±0.45 beats/m, respectively. The mean of %GMFM, MWS, and PCI between Group A and Group B at pre-training were not significant differences as shown in Table 2.

Table 2 Comparisons of %GMFM, MWS, and PCI between Group A and Group B before training.

	Group	Mean±SD	p-value
%GMFM (%)	A	87.73±9.45	0.72
	B	87.03±10.21	
MWS (m/min)	A	46.04±26.35	0.36
	B	47.65±28.78	
PCI (beats/m)	A	0.55±0.58	0.44
	B	0.44±0.45	

3. Comparisons of PCI, MWS, %GMFM, and Hip angle between pre- and post-training in Group A

The results indicated that PCI, MWS and %GMFM had significant differences between pre- and post- training ($p = 0.028$, $p = 0.007$, and $p = 0.028$, respectively). There were no significant differences between pre- and post- training of Hip angle ($p = 0.35$) as shown in Table 3

Table 3 Comparisons of Physiological cost index (PCI), maximum walking speed (MWS), gross motor function during standing (%GMFM), and hip joint angle during standing (Hip angle) between pre- and post- training for Group A

	pre-training (Mean ± SD)	**post-training** (Mean ± SD)	**p - value**
PCI (beats/m)	0.55 ± 0.58	0.32 ± 0.41	0.028*
MWS (m/min)	46.04 ± 26.35	63.34 ± 34.04	0.007*
%GMFM (%)	87.73 ± 9.45	93.16 ± 6.41	0.028*
Hip angle (degree)	168.81 ± 13.92	166.03 ± 14.77	0.35

* Significant $p < 0.05$

4. Comparisons of PCI, MWS, %GMFM, and Hip angle between pre- and post-training in Group B

For Group B, the results indicated that PCI, MWS and %GMFM had significant differences between pre- and post- training ($p = 0.028$, $p = 0.008$ and $p = 0.043$ respectively). There were no significant differences between pre- and post- training of Hip angle ($p = 0.173$) as shown in Table 4.

Table 4 Comparisons of Physiological cost index (PCI), maximum walking speed (MWS), gross motor function during standing (%GMFM), and hip joint angle during standing (Hip angle) between pre- and post- training for Group B

	pre-training (Mean ± SD)	**post-training** (Mean ± SD)	**p - value**
PCI (beats/m)	0.44 ± 0.45	0.13± 0.14	0.028*
MWS (m/min)	47.65 ± 28.78	70.72 ± 37.76	0.008*
%GMFM (%)	87.03 ± 10.21	93.59 ±5.06	0.043*
Hip angle (degree)	171.16 ± 11.83	164.38 ± 13.72	0.173

* Significant $p < 0.05$

5. Comparisons of percent changes after training of the PCI, MWS, %GMFM, and Hip angle between Group A and Group B

The results indicated that there were significant percent changes differences of PCI and MWS between groups (p = 0.009 and p = 0.046, respectively). There were no significant differences in percent changes of %GMFM, and Hip angle between groups (p = 1.00 and p = 0.134, respectively) as shown in Table 5.

Table 5 Comparisons percent change after training of Physiological cost index (PCI), maximum walking speed (MWS), gross motor function during standing (%GMFM), and hip joint angle during standing (Hip angle) between Group A and Group B

	Group A	**Group B**	**p - value**
	% changes differences (Mean ± SD)	**% changes differences** (Mean ± SD)	
PCI (%)	50.83 ± 15.86	79.99 ± 13.57	0.009*
MWS (%)	41.98 ± 15.73	69.19 ± 48.08	0.046*
%GMFM (%)	5.40 ± 4.14	6.56 ± 6.47	1.00
Hip angle (%)	3.40 ± 1.67	6.02 ± 5.22	0.134

* Significant p < 0.05