CHAPTER 4

RESULTS

4.1 Characteristics of the participants

The participants in this study were seven elite weightlifters (5 males and 2 females) who were selected to attend a national training camp. Participants performed regular weightlifting training program consisting of one hour of cardiovascular and strength training and three hours of skill training per day, 6 days per week. The sample mean $\pm$ SD of age, height, weight and year of experience were 23.57$\pm$ 4.08 years, 173 ∂ 7.25 cm, 85.25 ± 24.88 kg and 9.29±2.14 years, respectively.

4.2 Pain intensity

Raw data and mean ± SD of pain intensity are demonstrated in Table 4.1. Intensity of pain decreased to 0 at posttest 1 in six of seven participants. One participant showed an increased in pain intensity from baseline to posttest 1 and posttest 2. Mean ± SD of pain intensity at baseline, posttest 1 and posttest 2 were 4.93 ± 2.39, 1.00 ± 2.65, 1.25 ± 3.06, respectively. Friedman's ANOVA suggested a significant change over back school program and 1 month follow up (χ^2 (2) = 6.91, p < 0.05). Wilcoxon test with Bonferroni correction was applied and so all effects are reported at a .0167 level of significance. This study showed a tendency of significant difference between baseline and posttest 1.

Table 4-1 Pain intensity: raw scores, mean ± SD and summary of statistical tests

Subject	Baseline (R1)	Posttest 1 (R2)	Posttest 2 (R3)	X^2 for Friedman two way ANOVA by ranks	Multiple comparison for Friedman two-way ANOVA by ranks
A	2	0	0	6.91[a]	|R1-R2|=1.14[b]
B	2	0	0		|R2-R3|=0.14 [b]
C	8	0	0		|R1-R3|=1.00 [b]
D	5	0	0		
E	8	0	0		
F	4	0	0		
G	5	7	8		
mean	4.93	1.00	1.07		
SD	2.39	2.65	2.84		

[a] Statistical significant ($p < .05$)

[b] No statistical significant (Wilcoxon Signed Ranks test, $p > .0167$)

4.3 Back care knowledge

Raw data and mean ± SD of back care knowledge at baseline, immediate, posttest 1 and posttest 2 were presented in Table 4.2. Mean ± SD of back care knowledge measured at baseline, immediate, posttest 1 and posttest 2 were 15.57 ± 1.40, 18.29 ± 1.12, 17.00 ± 1.53 and 17.43 ± 0.98, respectively. Friedman's two way ANOVA between four conditions showed a significant change (χ^2 (3) = 11.36, $p <$ .05). Wilcoxon test was used to indicate difference between conditions. The study found that the participants' back care knowledge did not change significantly after attending the back school program (χ^2 (3) = 11.36, $p > .0125$). However, tendency of significant difference was detected between baseline and immediate test.

Table 4-2 Back knowledge: raw scores and summary of statistical test

Subject	Baseline (R1)	Immediate (R2)	Posttest 1 (R3)	Posttest 2 (R4)	X^2 for Friedman two way ANOVA by ranks	Multiple comparison for Friedman two-way ANOVA by ranks
A	14	19	19	18	11.36[a]	|R1-R2|=2.14 [b]
B	16	19	19	19		|R2-R3|=1.07 [b]
C	18	18	15	16		|R3-R4|=.28 [b]
D	16	19	17	17		|R1-R3|=1.07 [b]
E	15	19	16	18		|R1-R4|=1.35 [b]
F	14	16	16	17		|R2-R4|=.79 [b]
G	16	18	17	17		
Mean	15.57	18.29	17.00	17.43		
SD	1.40	1.12	1.53	0.98		

[a] Statistical significant ($p < .05$)

[b] No statistical significant (Wilcoxon Signed Ranks test, $p > .0125$)

4.4 Lumbopelvic stability test

Results of lumbopelvic stability test are presented in Table 4.3. The study found no significant difference in lumbopelvic stability outcome from back school program (χ^2 (3) = 4.867, $p > .05$).

Table 4-3 Lumbopelvic stability test: raw scores and summary of statistical tests

Subject	Baseline (R1)	Posttest 1 (R3)	Posttest 2 (R4)	X^2 for Friedman two way ANOVA by Ranks
A	1	1	1	.40
B	4	5	5	
C	4	3	3	
D	3	4	3	
E	1	1	1	
F	4	3	4	
G	3	3	2	

4.5 Quality of life

Quality of life was measured by The Thai SF-36V2. The level of quality of life was presented in eight domains; physical function, role physical, role emotion, bodily pain, vitality, social function, mental health, general health perceptions. Analyses of differences in mean scores between baseline 1, posttest 1 and posttest 2 using Friedman's ANOVA were demonstrated in Table 4.4. The data revealed that eight domains of SF-36 scores were not significantly different in all situations ($p >$ .05).

Table 4-4 Mean ± SD, (95%) scores of the 8 domains of SF-36 of Weightlifters

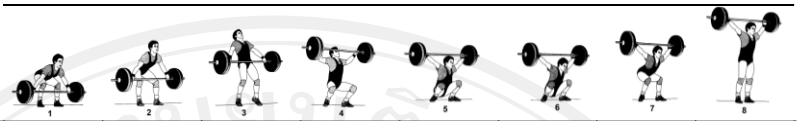
SF-36	Baseline N=7	Posttest 1 N=7	Posttest 2 N=7	*p*-value*
Physical functioning	75.00 ± 20.62	69.29 ± 15.39	82.86 ± 14.10	0.11
Role physical	75.00 ± 17.74	63.43 ± 20.51	72.29 ± 21.12	0.56
Bodily pain	53.57 ± 15.42	62.29 ± 22.55	67.00 ± 27.15	0.44
General health	63.57 ± 12.49	63.57 ± 25.77	63.57 ± 14.64	0.99
Mental health	57.86 ± 16.04	58.57 ± 22.31	67.14 ± 17.29	0.532
Role emotion	75.00 ± 18.06	70.14 ± 26.34	77.29 ± 20.78	0.787
Vitality	61.00 ± 15.68	59.14 ± 16.17	60.14 ± 17.64	1.000
Social function	66.29 ± 20.11	82.43 ± 12.18	80.57 ±21.34	0.457
PCS	66.79 ± 13.82	64.64 ± 13.00	71.43 ± 15.96	0.77
MCS	65.04 ± 14.71	67.57 ± 15.55	71.29 ± 17.98	0.86

PCS= physical component summary
MCS= mental component summary

4.6 Quality of lifting

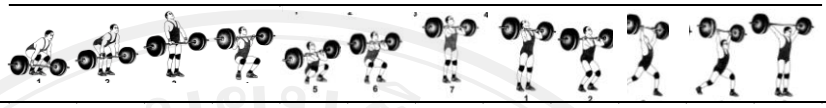
Pain intensity during each phase of snatch and clean and jerk lifting are presented in Tables 4.5 and 4.6, respectively. The results showed that 5 of 7 elite weightlifters had an improvement in pain during snatch lift and 6 of 7 weightlifters had an improvement in pain during clean and jerk lift. Conversely, one weightlifter had a progressively worse result in both snatch and clean and jerk lift when assessed at post test1 and 2.

Table 4-5 Quality of lifting: raw score of snatch lifting

Subject	Evaluate	Snatch 	Result
A	Base	2	+
	Post 1	0	
	Post 2	0	
B	Base	2	+
	Post 1	0	
	Post 2	0	
C	Base		*
	Post 1		
	Post 2		
D	Base	8 8	+
	Post 1	0 0	
	Post 2	0 0	
E	Base	8 7 8	+
	Post 1	0 0 0	
	Post 2	0 0 0	
F	Base	0 7 0 0	-
	Post 1	7 7 7 7	
	Post 2	8 8 8 8	
G	Base	4 2	+
	Post 1	0 0	
	Post 2	0 0	

Result= + improve, - worse
* No pain in this lifting position

Table 4-6 Quality of lifting: raw score of clean & jerk lifting

Subject	Evaluate	Clean & Jerk 	Result
A	Base	3	+
	Post 1	0	
	Post 2	0	
B	Base	2 2 3	+
	Post 1	0 0 0	
	Post 2	0 0 0	
C	Base	6 7 6 5 7	+
	Post 1	0 0 0 0 0	
	Post 2	0 0 0 0 0	
D	Base	8 8	+
	Post 1	0 0	
	Post 2	0 0	
E	Base	7	+
	Post 1	0	
	Post 2	0	
F	Base	0 7 0 7 0 0	-
	Post 1	0 7 7 7 7 7	
	Post 2	8 8 0 8 8 0	
G	Base	4 3	+
	Post 1	0 0	
	Post 2	0 0	

Result= + improve, - worse