



Effects of Neuromuscular training on lower segment movements and swing balance motions in high school baseball players

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INTRODUCTION

The neuromuscular training utilizes external stimuli to maximize motion errors and It is a neuromuscular training technique that leads to the recognition of the wrong posture to learn the movements necessary for correct movement. This study aimed to provide fundamental data of neuromuscular training on lower segment movements and swing balance motions in high school baseball players.

METHODS

In order to achieve the purpose of this study, 42 high school baseball players at K city were selected at random and allocated 14 high school baseball players each for the Non Exercise group (NEG), Deficient Exercise group (DEG), Over Exercise group (OEG). The exercise program was applied to DEG and OEG, and the interval speed and over run were checked before and after the experiment. The data obtained from this study were analyzed using the SPSS 24.0 statistical program and two-way repeated ANOVA was used.

Table 1. Demographic data

	Age (yrs)	Height (cm)	Weight (kg)	BMI (kg/ m ²)	Body Fat (%)
NEG (n=14)	17.14 ±1.94	174.86 ±4.84	78.32 ±6.62	24.36 ±2.02	23.64 ±2.01
DEG (n=14)	17.16 ±1.82	173.38 ±4.62	78.92 ±6.68	24.12 ±2.36	23.16 ±2.22
OEG (n=14)	18.02 ±2.07	175.02 ±5.34	77.98 ±7.89	24.04 ±2.29	23.28 ±2.21

Table 2. Exercise program

Stage	Exercise Program	Rest			Motion Frequency
		1-4 Week (reps/set)	5-8 Week (reps/set)	9-12 Week (reps/set)	
Warm-up (10 min)	Stretching	10/3	10/3	10/3	RPE 8-10
	Elastic band exercise				
Work-out (40min)	Ankle (pull & push)				
	Ankle (side)				
	Dynamic air cushion exercise	10/2	10/3	10/5	RPE 11-13
	Calf balance training				
Cool-down (10min)	Balance training				
	Functional gait exercise kit walking				
Cool-down (10min)	Stretching	10/3	10/3	10/3	RPE 8-10

Figure 1. Swing balance measurement methods

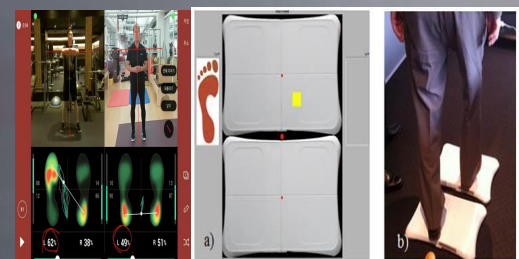
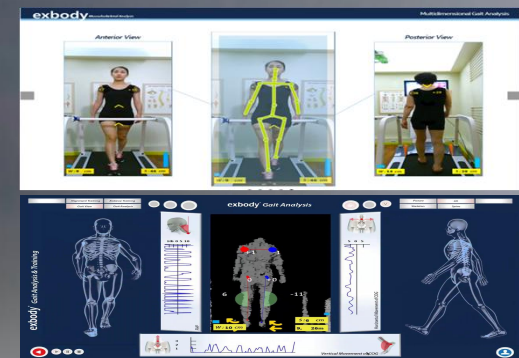


Figure 2. Lower segment movement measurement methods



RESULTS

Figure 3. Swing balance

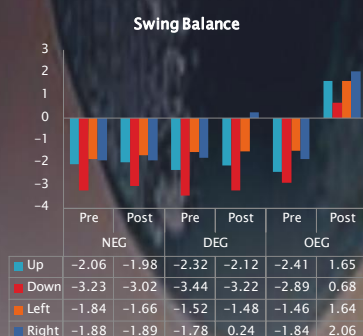


Figure 4. Ankle movement

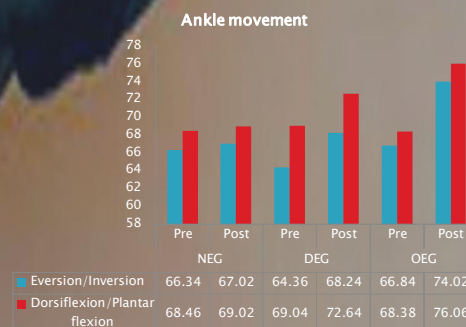
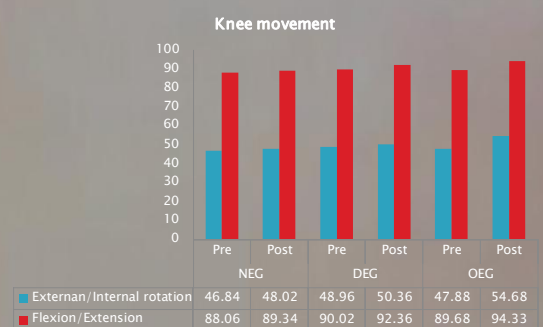


Figure 5. Knee movement



CONCLUSION

The conclusions obtained through this study are as follows. First, as a result of analyzing the change of lower segment movements to neuromuscular training, OEG was significantly improved compared to NEG and DEG. Second, as a result of analyzing changes in swing balance motions according to neuromuscular training, OEG was significantly improved compared to NEG and DEG. As conclusions, this study confirmed that the neuromuscular training could improve the lower segment movements and swing balance motions in the high school baseball players.