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Effects of Physical Fitness Rearing Education on the Task-Related Physical Fitness and SPECIFIC PHYSICAL FITNESS of College Students Majoring Police in KOREA

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Abstract

This study aimed to College Students Majoring Police of Physical fitness Rearing Education on Task-Related Physical Fitness and Specific Physical Fitness. Sixty voluntary subjects(30 exercise, 30 control) with an understanding toward the aims of this study were selected and their physical composition and Physical Fitness on Job Performance, before and after the Physical fitness Rearing Education program, were measured.

As for the Task-Related Physical Fitness, there were significant differences between pre- and post-values in the exercise group. Meanwhile, in the aspect of comparisons between post-values in both groups, there were significant improvements in push-up, sit-up, Grasping power, 100M Sprint and 1000M Run of the exercise group. As for the Specific Physical Fitness, there were significant differences between pre- and post-values in the exercise group after completing the Physical fitness Rearing Education. In the aspect of comparisons between post-values in both groups, there were significant improvements in only the exercise group.

The study results indicate that the Physical fitness Rearing Education program is effective in improving the Task-Related Physical Fitness and Specific Physical Fitness of College Students Majoring Police. However, there is a need for more specific exercise programs to be developed for the continual improvement of College Students Majoring Police performance in along with further studies to confirm the physiological benefits of those programs.

[Keywords] *Martial Arts, Police, Physical Fitness Rearing Education, Task-Related Physical Fitness, Specific Physical Fitness*

1. Introduction

The police which has a significant responsibility in governmental authority, has the closest relationship with the public's everyday life, and has a huge influence to the people's well and security. In other words, the police is in charge of duties from maintaining the basic public order such as traffic regulations, to establishing the fundamental law and order in everyday lives, and at the same time, in charge of every roles of attracting the national security by preventing and investigating the crimes[1]. These police duties are protection of the

people's liberty and right and maintain of public order, so as means to accomplish the purpose of the police, which are protecting the citizens' security and property, peace maintain, crime prevention and crime investigation, many anticrime policies and programs have been introduced[2]. The existence of police can be acknowledged when the police not only do their own duties, but also are regarded as a partner to solve the local issues with the local citizens. Furthermore, people expect not only the one-way service from the police, but also the Community Oriented Policing including the people's participation[3]. In order to handle

all duties including regular police duties and duties by the people's demand, the police officers are under great stress, vulnerable to chronic diseases because of insufficient exercise, and have 3 times higher rate of official death than other public safety offenders[4]. Likewise, even though it is crucial to have physical fitness to do patrol activity and criminal arrest, as a result of heavy workload, night duties and great stress, they are suffering from several illnesses and injuries, and even to death. However, there are no specific measures to deal with these issues[5].

Despite the efforts in order to magnifying the effects of the police by their proper duties, when the police is not functioning well, the life and the body of the people cannot be protected as whole, and the public well and order cannot be guaranteed. It is understandable that the requisites of physical fitness, which is the basic physical ability is highly demanded in order to perform the specific duties, and the police, as being the special national officer, cannot be excluded from these requisites. Thus, because of the job patterns that demand a strong physical fitness, the police organizations worldwide are operating the Physical Fitness Programs in their own way, but these are not getting better, as a result of work overload and manpower shortage

Exercise should be encouraged to police, because exercise not only improves the officers' physical health but also has a greater impact on the productivity of the organization. According to Kim[6], among officers, participants in sports activities have

lower rate of depression and anxiety than those who are not, and Lee et al[7] also suggested that the officer's sports club activities increased the teamwork, built the trust among group, and contributed to the job satisfaction. Also, sports club activities among officers encourage group unity and bond, increase work productivity, and effective preventing adult diseases such as metabolic syndromes and cardiovascular diseases.

As a result, more studies are needed about the importance of health related to officers' duty ability and the effects of increasing physical fitness on officers' health and duty ability. Thus, in this study, we provide basic materials for physical fitness for duty ability of officers and special improvement of physical fitness by analyzing the effects of physical fitness rearing education on college students majoring police.

2. Materils & Methods

2.1. Subject of study

This study was performed at students majoring in police in D University from March 2015 until December 2015, distributed by police martial arts trained group(EG/30 participants) and non-trained group(CG/30 participants). In the beginning, each group has 60 participants, but because personal illnesses and exercise absents, participants who gave up along the study(EG/15, CG/12) were excluded and are reorganized as having 60 participants each. The physical status of the participants are in <Table 1>.

Table 1. Physical characteristics of subjects.

M±SD

	Age(yrs)	Height(Cm)	Weight(Kg)	BMI(kg/m ²)
Exercise group (N=30)	20.47±1.14	176.79±5.80	67.40±8.75	21.96±2.67
Control group (N=30)	19.60±2.50	174.90±7.85	68.03±11.07	22.66±3.22

2.2. Measure and method

2.2.1. Physical composition test

Physical composition test was measured after participants arrived at the test place, removed all metals on the bodies, urinated, and took a good rest for five minutes. With Inbody 720(Biospace Co., Seoul, Korea),

weight(kg), BMI(kg/m²), WHR(%), body fat rate(%) were measured. The subjects were instructed to stand erect, put their legs and arms apart, and put their bare foot on the labeled site of measurement, then hold the electrode with their hands. Then according to the order of the machine, the body compositions were analyzed.

2.2.2. Fitness test

Table 2. Physical fitness on job performance test.

Items	Model	Manufacturer
Push-up	DW-732E	Deawoo sports industry (Seoul, Korea)
Sit-up	DW-731E	
Grasping power	DW-781	
100M sprint	DW-765E	
1000M run	DW-750A	

Table 3. Specific physical fitness.

Items	Measurement	Manufacturer
Strength	Back strength	Takei phycial fitness (Japan)
Strength endurance	Sit-up	
Power	Standing long jump	
Balance	One leg standing balance test	
Flexibility	Sitand reach	
Agility	Systemic response measurement	

2.2.3. Data process

The data of this research has been processed with SPSS 20.0(window statistical package) by calculating average and standard deviation of all collected data, and the significance test for within-group was practiced by Paried t-test before and after experiment, and the significance test for inter-group was practiced by Independent sample t-test before and after experiment. At this time, a significance level was set up p<.05.

The Change in Variance in task-related physical fitness following the police martial arts training is indicated in <Table 4>. Variance in physical fitness factor in EG showed significant differences in all factors including left grasping power, right grasping power, sit-ups, push-ups, 100m, 1000m, and in CG showed statistically significant differences in right grasping power, and sit-ups. Furthermore, pretest of group differences as a result of police martial arts training, there was no significant differences in all factors, while in post-inspection showed statistically significant differences in all factors including left grasping power, right grasping power, sit-ups, push-ups, 100m, and 1000m.

3. Results

3.1. Change in task-related physical fitness factor

Table 4. The change in physical fitness on job performance.

M±SD

Items		CG(n=30)			EG(n=30)			t**
		Pre	Post	t*	Pre	Post	t*	
Grasping power	L	38.43 ±11.60	38.95 ±11.15	-0.941	41.36 ±9.63	50.68 ±8.13	-15.836 ⁺⁺⁺	1.249a 5.439b ⁺⁺⁺
	R	43.05 ±9.11	40.09 ±9.61	3.434 [†]	45.82 ±8.63	55.70 ±6.82	-18.998 ⁺⁺⁺	1.421a 8.472b ⁺⁺⁺
Sit-up		43.88 ±6.65	41.35 ±7.07	2.903	42.58 ±7.58	54.30 ±6.77	-31.512 ⁺⁺⁺	-0.838a 8.507b ⁺⁺⁺
Push-up		35.51 ±10.11	35.86 ±9.10	0.493	36.53 ±10.06	53.73 ±13.05	-24.899 ⁺⁺⁺	0.457a 7.275b ⁺⁺⁺
100m		16.05 ±9.00	16.14 ±1.06	0.240	18.06 ±8.31	16.31 ±1.86	-5.817 ⁺⁺⁺	1.058a 5.667b ⁺⁺⁺
1000m		5.00 ±0.51	5.09 ±0.53	0.681	4.54 ±0.56	4.42 ±0.48	-4.151 ⁺⁺⁺	0.728a 6.619b ⁺⁺⁺

Note: * Paired t-test between pre- and post-values in a group

** Independent sample t-test' results between pre- and post-values in both groups

†,††, and ††† mean P<0.05, P<0.01, and P<0.001, respectively.

3.2. The change in specific physical fitness factor

The change in exercise function-related physical fitness factor is indicated in <Table 5>. Variance in physical fitness factor in EG showed significant differences in all factors including left counterbalance, right counterbalance, back muscle strength, flexibility, and ability, and in CG showed

statistically significant differences in left counterbalance, right counterbalance. Furthermore, pretest of group differences as a result of police martial arts training, there was no significant differences in all factors, while in post-inspection showed statistically significant differences in all factors including left counterbalance, right counterbalance, back muscle strength, flexibility, and ability.

Table 5. The change in specific physical fitness factor.

M±SD

Items		CG(n=30)			EG(n=30)			t**
		Pre	Post	t*	Pre	Post	t*	
Balance	L	16.76 ±9.13	21.85 ±8.54	-3.901 ^{††}	18.25 ±7.99	34.36 ±11.78	-13.971 ⁺⁺⁺	0.672a 4.710b ⁺⁺⁺
	R	17.19 ±9.45	19.95 ±10.45	-2.218 [†]	17.81 ±9.10	37.59 ±14.63	-12.922 ⁺⁺⁺	0.262a 5.372b ^{†††}
Back strength		114.63 ±18.48	113.48 ±21.36	0.870	109.77 ±14.19	130.92 ±22.96	-8.556 ⁺⁺⁺	-1.144a 3.045b [†]
Flexibility		12.76 ±4.55	13.09 ±4.28	-0.983	13.79 ±4.63	16.49 ±6.72	2.078 ⁺⁺⁺	0.864a 4.275b ⁺⁺⁺
Agility		293.25 ±12.37	288.97 ±12.08	1.845	291.72 ±14.99	258.28 ±26.13	8.101 ^{†††}	-0.432a -5.782b ^{†††}

Note: * Paired t-test between pre- and post-values in a group

** Independent sample t-test' results between pre- and post-values in both groups

†,††, and††† mean $P < 0.05$, $P < 0.01$, and $P < 0.001$, respectively.

4. Discussion

This research is By analyzing the effects of physical fitness rearing education on the task-related physical fitness and exercise function related physical fitness in 60 college students majoring police(EG 30, CG 30), this study discuss as following.

While physical fitness is a fundamental physical ability for managing a human life, in different aspects of body's activity, it can also be put as exercise ability or task ability. However, by scholars and eras, physical fitness is defined in various way; according to An et al[8], physical fitness is defined as not just in physical aspect, but in much more comprehensive term including physical, mental, social and spiritual aspects, so that it is actually a total of all abilities that are needed in managing life[9]. Physical fitness is constituted of fitness of performance, which is a force needed for activity, and fitness of protection, which is a physical force needed to adapt climate change and to fight off germs, but in most studies, physical fitness is a value by measuring cardiovascular endurance, body composition, muscular power, muscular endurance, flexibility, agility and etc[10].

In this study, in order to improve the chronic illness and lower job productivity of police officers, we measured 5 task-related physical fitness(grasping power, push-ups, sit-ups, 100m, and 1000m) and 4 exercise function physical fitness(counterbalance, back muscle strength, flexibility, and agility).

Duties of police requires high level of physical fitness and strong physical fitness can improve work productivity, therefore, it is a trend to encourage the officers to exercise[11]. Also, unlike elite physical education, police officers' exercise can not only improve the team members' health but also contribute a lot in organization productivity. As a result, as a way to improve the police officers' physical fitness, programs

including police martial arts and police physical fitness development programs are initiated[11]. Kim[6] suggested that officers who participated in sports activity has lower depression and anxiety level, and improve work productivity and health. Also, outside workers which requires more physical activity showed higher variance in physical fitness factors than inside workers. This agrees the term with this study's result that physical fitness rearing education has effects on improving police task-related physical fitness[12].

In addition, it also agrees the term with the result of the higher the participants' involving in physical fitness program, the more rate of improvement in work productivity and task-related physical fitness, and this supports that physical fitness rearing education has an effect on task-related physical fitness and exercise function related physical fitness in college students majoring police[13]. While most of the police officers are aware of the importance of physical fitness and a need to exercise, in reality, they cannot do exercise, and are suffering from various illnesses and injuries resulting from word overload, night duties and stress[14]. We have to face this reality, and as a basic study, the status of police exercise and how this effects on groups needs to be investigated in order to improve the welfare of police exercise.

To sum up, physical fitness rearing education can improve the task-related physical fitness and exercise function related physical fitness in college students majoring police, reduce work stress, and lower the incidence of metabolic syndromes and otehr stress-related illnesses. In contrast, the studies showing how exercise contribute to the organization do not exist, and organic integrate program between work productivity improvement and physical fitness should be developed.

5. Conclusion

This study focused on the effects of physical fitness rearing education on the task-related physical fitness and exercise function related physical fitness and confirmed that the improvement of the police officers' task-related physical fitness and exercise function related physical fitness can be developed through physical fitness rearing education.

For this research, participants were selected among college students majoring in police in D university, and we can get the following conclusions by investigating the effects of physical fitness rearing education on the task-related physical fitness and exercise function related physical fitness.

1. Variance of task-related physical fitness in EG as a result of physical fitness rearing education showed statistically significant differences in prior and post exercise in left grasping power, right grasping power, sit-ups, push-ups, 100m, and 1000m.

2. Variance of exercise function related physical fitness factor in EG showed statistically significant differences in left counterbalance, right counterbalance, back muscle strength, flexibility, and ability

In conclusion, we can confirm that physical fitness rearing education are effective in improving task-related physical fitness and exercise function related physical fitness in college students majoring police, and the development of specific physical fitness training program for improving health factors caused by police officers' work stress and for the crime prevention can improve the police officers' work ability.

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