Abstract

This study aimed to College Students Majoring Police of Police Martial Arts Education on Body composition and Physical Fitness on Job Performance. Eighty voluntary subjects (40 exercise, 40 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 Police Martial Arts Education program, were measured.

As for the physical composition, there were significant differences between pre- and post-values in the exercise group after completing the police Martial Arts Education. The change in physical composition has shown a significant change in EG group to weight, skeletal muscle mass, BMI, body fat percentage statistically and the physical composition has shown a significant change in CG group to skeletal muscle mass, BMI, body fat percentage statistically. Also, at the preliminary inspection between two different groups according to police military training, every variable of physical composition no significant difference was shown statistically, and at the post inspection, BMI, body fat percentage the significant difference was shown statistically. As for the Physical Fitness on Job Performance, there were significant differences between pre- and post-values in the exercise group. The change in physical variable in EG group has shown significant change in every variable such as grasping power in left hand, grasping power in right hand, sit-up, push-up, 100m, 1000m statistically, and the change in physical variable in CG group has shown significant change in grasping power in right hand statistically. Also, at the preliminary inspection between two groups according to the police military training has not shown a significant change in every variable, however, at the post inspection, a significant change has shown in every variable.

The study results indicate that the Police Martial Arts Education program is effective in improving the Body composition and Physical Fitness on Job Performance 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, Education, Body Composition, Physical Fitness on Job Performance

1. Introduction

The duty of police is a protection of freedom and rights of the public, so various anti-crime measures and programs have been introduced to fulfill their goals so called 'Police Effect' which are ensuring the safety and assets of citizens, maintaining peace, crime prevention and crime investigation[1]. Reflecting this, according to the data of Statistic Department, the crime rate of our society has been doubled in 30 years, and it has been drastically increased since 2000. Also, violent crimes such as murder, robbery, arson, and rape are prone to increase every year, and it shows a high level of violent crime rate among Asian countries. According to the crime analysis data of Supreme Prosecutors' Office, during the last 30 years, the percentage of criminals has been increased by 2.5 times. As a part of this, even though the police policy that the government is currently
promoting emphasizes the importance of safe society through the four eradication of social evil and a decrease in violent crimes, it is estimated that the safety index that the public actually feel stays at a low level[2].

The policemen are putting their efforts into maximizing the 'police effect' through their duties, however, the public actually feel the existence of policemen when they consider them as a 'problem solving officer'. People admit the existence of the police when they consider them as partners who can give some solutions to the society problems together in addition to the duties that the policemen provide. In other words, the public expects not only the services which are provided by police unilaterally, but also the 'Community Oriented Policing'[3]. Because of this, policemen are under a lot of stress, and are also vulnerable to the chronic metabolic disease which is prevalent for contemporary society due to the lack of exercise. The police are more likely to lose their physical balance due to the frequent emergency duties and all-night working, and especially the local policemen are vulnerable to the cardiovascular disease because they usually overwork for a long time, and also they are pestered by drunken people[4]. As such, one's physical strength is one of the most crucial factor to policemen due to the patrols, arresting a suspect, and so on, however, even though they are still suffering from various disease and injuries, and death from overwork because of heavy workload and all-night working, no measure is clearly created. Since the policemen require strong stamina because of this characteristic of their duties, many police organizations from all countries of the world manage their own strength maintenance programs. In our country, a physical fitness test has been operating since 2000 including police military training, and also since 2011, when hiring new recruits, they have increased the percentage of an examination of physical strength rate, and changed some events. To policemen, exercise has to be encouraged because it does not only enhance their health, but also has a positive impact on organization's productivity. Nevertheless, the biggest reason why policemen's lack of exercise does not improve is because of heavy workload, and also a lack of awareness of a chief of an organization that individual policeman's health improvement is also helpful for the performance of organization.

As such, continuous research is required to prove that the importance of health and an increase in physical strength have a direct impact on the policemen's performance of their duties and their health. Therefore, its purpose is to compare and analyze the effects that the police military training have on policemen's physical composition, and to provide as a basic material for development in strength for policemen's performance of one's duties.

2. Materials & Methods

2.1. Subject of study

This study was conducted by students studying police science from D university, and C university from March.2015 to December.2015, and was categorized into police military training group(EG/40people) and non-training group(CG/40 people). At the beginning, 50 people per group participated, however, some participants were excluded due to personal diseases, discontinuing further exercise, and so on(Eg/10 people, CG/8people), so participants were adjusted to 40 people per group. Physical traits of participants are shown in <Table 1>.

Table 1. Physical characteristics of subjects. M±SD

<table>
<thead>
<tr>
<th></th>
<th>Age(yrs)</th>
<th>Height(Cm)</th>
<th>Weight(Kg)</th>
<th>BMI(㎏/㎡)</th>
<th>Bady fat(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>EG</td>
<td>20±2</td>
<td>175±5</td>
<td>68±5</td>
<td>23±2</td>
<td>20±3</td>
</tr>
<tr>
<td>CG</td>
<td>20±2</td>
<td>175±5</td>
<td>68±5</td>
<td>23±2</td>
<td>20±3</td>
</tr>
</tbody>
</table>
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 feet 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>
<thead>
<tr>
<th>Items</th>
<th>Model</th>
<th>Manufacturer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Push-up</td>
<td>DW-732E</td>
<td>Deawoo Sports Industry, Seoul, Korea</td>
</tr>
<tr>
<td>Sit-up</td>
<td>DW-731E</td>
<td></td>
</tr>
<tr>
<td>Grasping power</td>
<td>DW-781</td>
<td></td>
</tr>
<tr>
<td>100M Sprint</td>
<td>DW-765E</td>
<td></td>
</tr>
<tr>
<td>1000M Run</td>
<td>DW-750A</td>
<td></td>
</tr>
</tbody>
</table>

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.

3. Results

3.1. Change in physical composition

Table 3. The changes of physical composition. M±SD

<table>
<thead>
<tr>
<th>Items</th>
<th>CG(n=40)</th>
<th>EG(n=40)</th>
<th>t*</th>
</tr>
</thead>
<tbody>
<tr>
<td>pre</td>
<td>post</td>
<td>pre</td>
<td>post</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### 3.2. The change in physical variable

The change in duty strength variable according to police military training is shown in Table 4. The change in physical variable in EG group has shown significant change in every variable such as grasping power in left hand (p=.000), grasping power in right hand (p=.000), sit-up (p=.000), push-up (p=.000), 100m (p=.000), 1000m (p=.000) statistically, and the change in physical variable in CG group has shown significant change in grasping power in right hand (p=.000) statistically. Also, at the preliminary inspection between two groups according to the police military training has not shown a significant change in every variable, however, at the post inspection, a significant change has shown in every variable.

<table>
<thead>
<tr>
<th>Items</th>
<th>CG(n=40)</th>
<th>EG(n=40)</th>
<th>t**</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>pre</td>
<td>post</td>
<td></td>
</tr>
<tr>
<td>Grasping power</td>
<td></td>
<td></td>
<td>t*</td>
</tr>
<tr>
<td>L</td>
<td>38.43±11.60</td>
<td>38.95±11.15</td>
<td>-0.941</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>R</td>
<td>43.05±9.11</td>
<td>40.09±9.61</td>
<td>3.434†</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sit-up</td>
<td>43.88±6.65</td>
<td>41.35±7.07</td>
<td>2.903</td>
</tr>
<tr>
<td>Push-up</td>
<td>35.51±10.11</td>
<td>35.86±9.10</td>
<td>0.493</td>
</tr>
<tr>
<td>100m</td>
<td>16.05±9.00</td>
<td>16.14±1.06</td>
<td>0.240</td>
</tr>
<tr>
<td>1000m</td>
<td>5.00±0.51</td>
<td>5.09±0.53</td>
<td>0.681</td>
</tr>
</tbody>
</table>

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 supposed to discuss about the effects after comparing and analyzing the influences of the police military training on the strength to perform duties targeting 80 majors of police related study (Training group 40, Non-training group 40). The duty of police renders it strictly necessary to arrest and observe criminals, so policemen require a high level of physical strength, and police organizations from all countries of the world manage their own fitness management program because of this characteristic of policemen where great physical strength is necessary[5]. In our country, the police organization operates police military training and physical fitness tests, and encourage police to exercise, and it shows some positive effects. Unlike elite physical training, the exercise of policemen not only improve one’s health, but also contribute to productivity of an organization. Also, police military training as a program for promoting policemen’s physical strength has a significant impact on arresting criminals, suppressing the mass, basic physical improvement for mission accomplishment, and it is also said that police military training such as self-defence martial art and arrest technique and so on has a great impact on general policemen’s duty development[6]. According to research targeting policemen, KIM[7] says that participants of sports activities have a lower rate in depression and anxiety than non-participants of sports activities, and that the police military training for performing tasks and improving quality of work is greatly helpful for mental stability, self-realization, and health[8]. Also, in the research conducted by LEE et al[8], it is said that sports club activities of policemen enhance teamwork of the group, build trust, and contribute to job satisfaction.

According to the research of Sangyong PARK[9] on policemen strength, in the relation between the strength of policemen according to the job patterns and the risk of metabolic syndrome, an outdoor service employee is more likely to have more physical activities and fitness management programs than a indoor service employee, and it is also reported that the former has a higher level of physical variable than the latter which matches the result of this research that the police military training has a positive impact to the police on the stamina to perform their duties. Also, it matches the result of the research[10] which says that the police with high strength levels are more likely to have a low BMI and a low possibility of metabolic syndrome, and it supports the result that the police military training impacts the body composition variables and strength of the participants. However, with the reality where even though most policemen recognize the importance of strength and the value of fitness, they are not able to work out, and the reality where the police suffer from various diseases, injuries, and death from overworking, no clear measure is created even though what they truly need is a high level of strength in order to practice their duties such as patols and arresting criminals, What should be done first to improve the health welfare environment is investigating the exercise reality of the police and analyzing how the exercise impacts the performance of the organization. To sum up, the police military training is highly helpful for policemen’s physical composition and stamina to perform duties, and it reduces stress and lowers the possibility of metabolic syndrome and diseases caused by stress of modern society. However, it is the reality that the research on how exercise contributes to the organization targeting policemen is unprecedented, and the systematic mutual programs should be created for improvement of ability to perform duties and great stamina for policemen.

5. Conclusion

This research aims to investigate that the police military training has a significant impact on policemen’s physical composition and strength, to confirm that the improvement on policemen's performance on duty can be accomplished through the police military training, and to provide the basic source for improvement of strength to perform their duties.
To accomplish this goal, 80 students of police related majors were selected from D University and C university, and the following conclusion was drawn after observing the effects of the police military training on the physical composition and the stamina of policemen.

1. The change in physical composition in terms of the police military training has shown significant difference in weight, skeletal muscle mass, BMI, body fat percentage statistically among EG group participants before and after training, and between the groups, a significant difference has shown in BMI, body fat percentage statistically.

2. The change of duty strength variable in terms of the police military training has shown a significant difference in every strength variable such as grasping power in left hand, grasping power in a right hand, a sit-up, a push-up, 100m, and 1000m statistically, and between the groups, a significant difference has shown in every variable such as grasping power in left hand, grasping power in a right hand, a sit-up, a push-up, 100m, and 1000m statistically.

In conclusion, it is found to be true that the police military training is an effective way of exercise for strength for police duties, and creation of the professional fitness training programs for improvement in health from job stress and dealing with crimes, is thought to be an advancement in the policemen's ability to perform duties.

6. References

6.1. Journal articles


6.2. Thesis degree


6.3. Books


6.4. Additional references


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