

태권도 수련에 따른 신체적 자기개념 인식 변화

Change of Physical Self-concept according to Taekwondo Discipline

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요약

이 연구는 태권도 수련집단과 비수련집단의 신체적 자기개념 인식에 대한 변화차이를 규명하는 것에 목적이 있었다. 이러한 연구목적을 달성하기 위하여 연구대상은 S시에서 1개 초등학교를 연구자가 임의로 선정하였다. 그리고 ACSM(2000) 운동 가이드라인 기준에 따라 태권도 참여집단 30명, 비참여집단 40명을 선정한 후 12주 간격으로 3차례에 걸쳐 반복측정을 통한 이원혼합설계를 활용하여 연구를 수행하였다. 이것의 통계처리방법은 SPSS 12.0 for Windows를 활용한 기술통계, 이원변량분석, 대응 t검정과 독립 t검정이었다. 이러한 과정을 토대로 연구를 수행한 결과에 기초하여 다음과 같은 결론에 도달하였다. 첫째, 태권도 수련집단과 비수련집단은 측정시점에 따라 신체적 자기개념의 변화패턴에는 전반적으로 차이가 있다. 둘째, 태권도 수련집단과 비수련집단의 신체적 자기개념 점수는 1차보다 2차가 그리고 1차보다 3차가 높게 나타났다. 셋째, 태권도 수련집단과 비수련집단 간에 신체적 자기개념에서는 2차와 3차 측정에서 집단 간에 차이가 있다. 즉, 두 집단은 태권도 수련에 따른 신체적 자기개념의 변화패턴에는 전반적으로 차이가 있다. 결론적으로 태권도 수련은 청소년의 신체적 자기개념 변화에 효과가 있다.

■ 중심어 : | 태권도 | 청소년 스포츠 | 신체적 자기개념 |

Abstract

The purpose of this study was to verify differences in changes of physical self-concept between Taekwondo participation group and non Taekwondo participation group in order to meet the needs of the study the limitations of previous studies had to be considered. The participants were elementary students in S city selected by this researcher. 30 students were in the Taekwondo participation group and 40 students were in the non Taekwondo participation group decided by ACSM(15) exercise guide line standard, three times repetition measurements per 12 weeks were executed for 2×3 mixed design with repeated measure. For this statistic, SPSS 12.0 for windows was used for technical statistic, two-way ANOVA, paired t-test, and independent t-test. The results were as follows: First, there were differences of change pattern in physical self-concept generally between Taekwondo participation group and non Taekwondo participation group. Second, there was a difference between Taekwondo exercise group and non Taekwondo exercise group according to 1st and 2nd, 1st and 3rd measurement point partially. Third, there were differences between the Taekwondo exercise group and non Taekwondo exercise group on the 2nd and 3rd measurement. In conclusion, Taekwondo discipline tended to have a large effect increasing physical self-concept.

■ keyword : | Taekwondo | Youth Sport | Physical Self-concept |

I. Introduction

In Korea, the representative physical activity in which the youth participate is Taekwondo. Taekwondo is not only the representative sport that contributes to developing the youth's body and mentality, but also is practiced worldwide. The martial arts aims to help trainees cultivate mentality and realize themselves through physical training and discipline. That is, it helps them understand the concept of truth and apply it to life. Especially, Taekwondo, unlike other general sports, doesn't weight importance on sport participation itself but on having a positive impact on mentality through training process.

The effect of the training has a close relation with its program. Training program consists of 'basic motions' such as kicking, punching, and blocking; 'Poomsae' executed on a certain line of offense and defense with arm and leg techniques; 'duel' focusing on the applied motions of kicking, which implies sportsmanship; demonstration' that shows off its techniques; and 'the art of self-defense'. Like this, because Taekwondo thinks that mental regulation and self-control is important, the concept of body is very important.

Meanwhile, human tends to evaluate himself or herself. We call the evaluation self-concept 'positive or negative'. Human behaviors are determined and expressed through a very complicated process in his or her cerebral cortex. Such behaviors can be expressed very differently depending on how or she recognizes neighboring circumstances and thinks about him/herself. This involves the whole concept of study, society, emotion, body and so on. This overall concept is developed to a multi-dimensional perspective consisting of sub-factors divided from each of the whole concept.

Speaking of this self-concept, Judge, Erez & Bono[22] suggested that a positive self-concept has a positive impact on ability to cope with emergency, cooperation and effort, and emotional stability. And among the overall self-concept, physical self-concept plays the most important role regardless of culture, age and sex[4]. Under this weighted reason, various studies on self-concept have been already carried out in sports psychology and such studies also spread interest in Taekwondo and some are faithfully being conducted.

The studies of physical self-concept have been developed on the youth: Taekwondo training has a positive impact on self-concept [1][10]; Taekwondo training influences over physical self-concept[3]; Taekwondo training has a positive impact on self-concept(8); youth physical education program has impact on self-concept[2]; and the participation of handicapped students in sports has a positive impact on physical self-concept[5].

However, the precedent studies described above implanted the psychological theories developed abroad or in domestic sports environment to Taekwondo without modification and the measures for physical self-concept designed for middle school students or older were used for the studies. According to Jeon[14], numbers of the studies focusing on children and the youth lack in systematic approaches to their characteristics or self-concept.

Furthermore, many of precedent studies tend to apply their findings, which were based on mean differences, too broadly to development or change of self-concept by training period or (none- or) participation in training. Against this, Song Hyung Seok & Lee[10] suggested that although some studies have been conducted on the training effect of Taekwondo, most of them are limited to the analysis in the relationship, so that longitudinal repetitive

research design is necessary to examine the changes in latent variables in detail. In other words, it is not proper to conclude that a group changed through the training only depending on the findings resulted from once time questionnaires distributed to and collected from groupings divided by participation itself or participation period in Taekwondo training. To overcome the limitation, Song Kil Yeon, Kim Soo Jeong, Lee Ji Yeon and Yang Kyu Dong[9] suggested a survey had to be carried out at least twice and for more than 6 months per. And Park and Kang[7] noticed that repetitive survey design is an effective method in examining the changing trend of dependent variables and the treatment effect of independent variables in time flow.

As abovementioned, scholars[1][9][13] have the similar opinion that cross-sectional study design is good at finding the effect of temporal and economic aspect, but limited to applying the theories related to the change and development. Particularly, Lim[13] indicated that although most studies on the youth focused on the change and development of their physical self-concept by participation in sports, their research designs didn't faithfully reflect it. Putting all together to summary, most of precedent studies on the participation of the youth in sports maintain that Taekwondo programs have positive effects on their self-concept, but it is true that they don't demonstrate specific evidences on their assertions.

Therefore, this study will supplement the precedent studies with such limitations by dividing research groups into participants and non-participants in Taekwondo program and measuring their physical self-concept in a repeated manner during the period of the training for the purpose of examining the difference in change.

To get the purpose of this study, the study problems are as follows: First, is there a general

difference in the changing pattern of physical self-concept between the participant and non-participant in Taekwondo program?

Second, is there a general difference in the measured scores of physical self-concept between the participant and non-participant groups in Taekwondo program?

Third, is there a general difference in the scores of physical self-concept between the 2nd and 3rd measure?

II. Method

1. Participants

Purposive sampling was used to choose one elementary school in S city. Among the students between in the 3rd to the 6th grade, 40 students who didn't participate regularly in private Taekwondo institutes or and the school aptitude program for physical activity were chosen. For this selection to be reasonable, the researcher strictly followed ACSM sports guideline[15].

2. Measurements

This study used the demographic factors such as sex, exercising(yes or no), participatory period, frequency and intensity to see if samples stay in the ranges of tolerance of group characteristics during repeated measurement.

And the measures developed by Lim[13] were used to examine physical self-concept. In his study *The Development of Taekwondo's Psychological Change Model and Its Verification*, he developed the measures on the applicability of physical self-concept, focusing on children and the youth.

[Table 1] shows the structural matrix by the factor rotation on physical self-concept. The result shows

that Kaiser–Meyer–Olkin (KMO), which is a measure of sampling adequacy, is high (.858), the communalities of all the explored factors are over .3, and the exploratory power of the variables explaining of latent variables is 75.242%. In total 7 factors and 28 items were explored.

Table 1. Exploratory Factor Analysis

| | Factor 1 | Factor 2 | Factor 3 | Factor 4 | Factor 5 | Factor 6 | Factor 7 | h ² |
|-------------------------|------------|----------|----------|-------------------|-----------|-------------|-------------------|----------------|
| v45 | .892 | .095 | .009 | .359 | .382 | .392 | -.594 | .814 |
| v44 | .886 | .108 | .019 | .454 | .439 | .447 | -.548 | .833 |
| v46 | .867 | .087 | .071 | .423 | .400 | .402 | -.643 | .798 |
| v40 | .807 | .116 | .100 | .356 | .469 | .418 | -.612 | .712 |
| v30 | .126 | .908 | .093 | -.039 | .213 | .053 | -.172 | .830 |
| v29 | .024 | .842 | .025 | -.100 | .162 | .054 | -.089 | .729 |
| v27 | .046 | .840 | .085 | -.095 | .213 | -.032 | -.146 | .714 |
| v31 | .154 | .837 | .039 | -.133 | .187 | .009 | -.159 | .713 |
| v14 | .034 | .044 | .860 | .133 | .084 | -.113 | -.084 | .742 |
| v10 | .019 | .094 | .838 | .170 | .162 | -.076 | -.133 | .710 |
| v9 | .042 | .101 | .831 | .190 | .096 | -.042 | -.103 | .705 |
| v13 | .020 | -.012 | .796 | .189 | .128 | -.053 | -.093 | .656 |
| v38 | .425 | -.026 | .185 | .905 | .294 | .374 | -.346 | .839 |
| v33 | .330 | -.055 | .192 | .882 | .317 | .331 | -.252 | .787 |
| v37 | .271 | -.115 | .111 | .772 | .242 | .343 | -.139 | .618 |
| v39 | .334 | -.110 | .252 | .706 | .197 | .286 | -.361 | .550 |
| v3 | .348 | .206 | .176 | .290 | .829 | .228 | -.515 | .754 |
| v2 | .371 | .150 | .001 | .354 | .643 | .260 | -.310 | .470 |
| v7 | .304 | .178 | .094 | .290 | .641 | .204 | -.350 | .437 |
| v6 | .339 | .171 | .178 | .114 | .620 | .175 | -.255 | .421 |
| v24 | .161 | -.066 | -.054 | .288 | .057 | .700 | -.190 | .521 |
| v17 | .327 | .042 | -.082 | .194 | .225 | .700 | -.230 | .509 |
| v20 | .353 | .035 | -.038 | .340 | .176 | .661 | -.254 | .460 |
| v22 | .355 | .135 | -.049 | .273 | .305 | .631 | -.347 | .443 |
| v52 | .601 | .185 | .126 | .292 | .463 | .365 | -.868 | .786 |
| v50 | .524 | .188 | .114 | .254 | .344 | .307 | -.842 | .715 |
| v53 | .619 | .246 | .142 | .330 | .358 | .360 | -.770 | .670 |
| v48 | .471 | .061 | .042 | .219 | .398 | .285 | -.666 | .480 |
| eigenvalue | 8.830 | 3.616 | 2.747 | 1.813 | 1.472 | 1.346 | .913 | |
| exp. variableness | 27.594 | 11.301 | 8.583 | 5.666 | 4.601 | 4.206 | 2.852 | % |
| cumulative variableness | 27.594 | 38.895 | 47.478 | 53.144 | 57.745 | 61.951 | 64.803 | % |
| factor | competence | obesity | disease | physical strength | endurance | flexibility | sports confidence | |

Extraction: maximum-likelihood classification
Rotation: Kaiser–Normalized Oblimin

Next, to confirm the internal consistency, this study conducted reliability test and came up with the

confidence coefficients of each of 7 factors.

The first factor (endurance) has Cronbach's Coefficient Alpha(α) Reliability Estimates (Cronbach' α in short) is .787; Cronbach'α of the second factor (disease) is .898; the third factor (flexibility) has Cronbach'α of .751; the fourth factor (obesity) shows α= .904; the fifth factor (muscular strength) is α=.882; the sixth factor (competence) is α=.927 and seventh factorm (confidence in sports) has α=.982. All of the confidence coefficients of the seven factors turned out high.

3. Design and Procedure

To carry out this study, selection and scheduling of a school and a gym were prepared. Also, research design was set and Taekwondo program was selected for repetitive measurement. The following table shows you the detailed information upon these.

Table 2. Taekwondo Program

| Stage | Period | Contents |
|-----------------------------|-----------------------|---|
| 1 st measurement | 1 st Week | ·Taekwondo: Basic motions, Basic kicking, Poongsae, meditation |
| | | ·School Physical Education: physical strength exercise, recreation |
| | | ·Spiritual Education: bowing (good manner) |
| 5 th Week | 5 th Week | ·Taekwondo: Basic motions, Basic kicking, Poongsae overall rehearsal, meditation |
| | | ·School Physical Education: School Physical Education(rope-jumping), recreation |
| | | ·Spiritual Education: reading (more than 2 books) |
| 9 th Week | 9 th Week | ·Taekwondo: Basic motions, Poongsae stance correction and overall rehearsal, kicking at a mat, Sequential kicking, meditation |
| | | ·School Physical Education: School Physical education evaluation (horsing vaulting box) |
| | | ·Spiritual Education: bowing (good manner) |
| 2 nd measurement | 13 th Week | ·Taekwondo: basic technique motions and kicking, individual Poongsae, sequential kicking at a mat, Basic self-defense technique, group Poongsae (stance correction), meditation |
| | | ·School Physical Education: School |

| | | |
|-----------------------------|-----------------------|--|
| | | Physical Education (rope-jumping and horsing vaulting box), physical strength exercise ·Spiritual Education: keeping promise |
| | 17 th Week | ·Taekwondo: basic technique motions and kicking, set duel, individual Poongsae, self-defending technique 7-8, meditation ·School Physical Education: School Physical Education(cross jump rope, rolling) ·Spiritual Education: helping parents |
| | 21 st Week | Taekwondo: basic technique motions and kicking, individual Poongsae, duel, meditation School Physical Education: School Physical Education(horsing vaulting box, tumbling, falling down over barriers) Spiritual Education: massaging parents |
| 3 rd measurement | 24 th Week | Taekwondo: basic technique motions and kicking, individual Poongsae, duel stance correction, meditation School Physical Education: School Physical Education (horsing vaulting box, falling down over barriers) Spiritual Education : talking nicely |

To schedule 3 repeated surveys with the teachers of the chosen school and the masters of Taekwondo gym, the researcher collected possible dates and notified exact dates of interviewing. The questionnaires were sent to the teachers and the masters a week before the interview as well as interview guidelines.

For the research design, dual mixed method was used for repeated measurement. 3 different time periods of measurement (1st, 2nd and 3rd) by the participation periods of the participants and non-participants in Taekwondo training was set as independent variables and physical self-concept was set as dependent variable. The first interview was conducted with children and the youth, who met criteria for each group, in 3rd to 6th grade in an elementary school, from March 22 through 24 in 2006. The second interview was carried out from June 14-16 and the third one went on from September 6 through 8. All of 3 interviews were carried out at 12-week interval

To select Taekwondo program, a private Taekwondo school was chosen that was using the similar program to that proposed by Open Taekwondo Research Institute of Korean Taekwondo Association. This study placed its main interest in confirming the changes in physical self-concept of group by measured period. The children and young participants participated in the program suggested in [Table 2] more than 4 times a week or 5 hours.

4. Data processing

The collected data were processed by SPSS 12.0 for Windows. The descriptive statistics (mean and standard deviation) of sub-variables belonging to each common area were obtained for two-way ANOVA analysis and then the analysis was carried out at the points of repeated measurement by group. When interaction effect are not found, paired and independent t-test were conducted as means of main effect analysis for the measured periods and groups.

III. Results

1. Homogeneity Between groups

Before testing the changes in physical self-concept by measured period and group, this study conducted homogeneity between groups. From the results of independent t-test, the data from the 1st survey with the participants and non-participation of Taekwondo program interview show that they (two groups) didn't have statistically significant difference in endurance ($t=1.666, p > .05$), diseases ($t=-.482, p > .05$), flexibility ($t=1.440, p > .05$), obesity ($t=-1.882, p > .05$), physical strength ($t=1.669, p > .05$), competence ($t=1.718, p > .05$), confidence in sports ($t=1.188, p > .05$). On the basis of these data, the data collected by the repeated measurement were put under two-way ANOVA and

the results are as follows.

2. Changes in Physical Self-Concept

1) Level of Awareness of Endurance

[Table 3] shows you the mean and standard deviation of endurance by measured time point and group. The participant group in Taekwondo program showed increase in all of 3 times (1st (2.23), 2nd (2.48), and 3rd (2.62)) while non-participant group in Taekwondo program had no change in physical self-concept in 1st (1.97) and 2nd (1.97) and even in the 3rd measurement it showed decrease a bit. The two-way ANOVA analysis using descriptive statistics shows the followings.

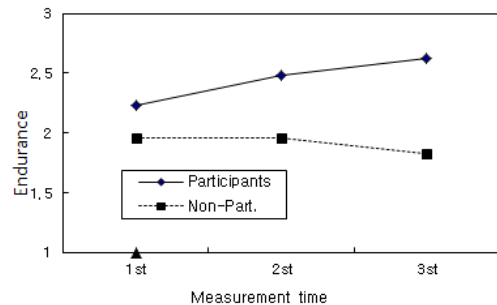
There was interaction effect between groups and time point measured on endurance factor ($F(2, 104) = 3.742(p < .05)$). That meant that there existed a difference in the pattern of endurance between the participant and non-participant group. [Table 3] also shows that the participant group in Taekwondo program has higher score in endurance at every measurement time than non-participant group in Taekwondo program.

Table 3. Endurance

| | Participants | | Non-participants | |
|-----------------|--------------|-----|------------------|-----|
| | M | SD | M | SD |
| 1 st | 2.23 | .57 | 1.97 | .58 |
| 2 nd | 2.48 | .70 | 1.97 | .64 |
| 3 rd | 2.62 | .62 | 1.83 | .49 |

Paired t-Test was carried out to know the difference more in detail by measured time point. The result showed that the participant group in Taekwondo program had statistically significant difference between 1st and 3rd period ($t_{22} = -3.563, p < .01$) while the non-participant group in Taekwondo program didn't show any significant difference at all of measured time points. Also, independent t-Test

showed that there was no difference in score between two groups in the 1st point ($t_{53} = 1.666, p > .05$) but at the second and third period two groups showed statistically significant difference between groups: 2nd ($t_{52} = 2.784, p < .01$) and 3rd ($t_{53} = 5.371, p < .01$).



Next, the results of the paired test of between-subjects were confirmed to know the changing trend of endurance by measured time point. In the result, the linear trend between the time points and the groups (AxB) turned out to be $F(1, 52) = 7.643(p < .01)$, which was statistically significant. In other words, as seen in [Fig. 1], the change trend was linear between the time points and the groups had different orientation to move.

2) The Level of Awareness of Diseases

[Table 4] shows you the mean and standard deviation of diseases by measured time point period and group. The participant group in Taekwondo program showed increase at all of 3 measured time points (1st (3.30), 2nd (3.45), and 3rd (3.55)) while non-participant group in Taekwondo program had slightly increased value at 1st measured point (3.39) and 2nd (3.44) but at the 3rd measured point it showed slight decrease (3.41). The two-way ANOVA analysis using descriptive statistics shows the followings.

Table 4. Diseases

| | Participants | | Non-participants | |
|-----------------|--------------|-----|------------------|-----|
| | M | SD | M | SD |
| 1 st | 3.30 | .64 | 3.39 | .61 |
| 2 nd | 3.45 | .72 | 3.44 | .73 |
| 3 rd | 3.55 | .49 | 3.41 | .54 |

The interaction effect between groups and time points measured on this factor (diseases) wasn't statistically significant ($F(2, 104) = .612(p < .05)$). Next, main effect analysis was carried out for the measured time periods. The results showed no statistical significance by the point ($F(2, 104) = .937(p > .05)$). And the results of the paired test of between-subjects were confirmed that the mean values of disease in two groups were statistically significant ($F(1, 52) = .853(p < .05)$).

3) The Level of Awareness of Flexibility

[Table 5] shows you the mean and standard deviation of flexibility by measured time point period and group. The participant group in Taekwondo program showed increase at all of 3 measured time points (1st (2.30), 2nd (2.40), and 3rd (2.56)) while non-participant group in Taekwondo program had slightly decrease in all of 3 points (1st (2.07), 2nd (1.98), and 3rd (1.96)). The two-way ANOV Aanalysis using descriptive statistics shows the followings.

Table 5. Flexibility

| | Participants | | Non-participants | |
|-----------------|--------------|-----|------------------|-----|
| | M | SD | M | SD |
| 1 st | 2.30 | .59 | 2.07 | .53 |
| 2 nd | 2.40 | .65 | 1.98 | .58 |
| 3 rd | 2.56 | .58 | 1.96 | .54 |

The interaction effect between groups and time points measured on flexibility factor didn't exist. Next, main effect analysis was carried out for the measured time periods. The results showed no statistical significance by the point ($F(2, 102)$

$= .330(p > .05)$). But, the results of the paired test of between-subjects turned out $F(1, 51) = 15.294(p < .01)$, which was statistically significant. [Table 5] shows that the participant group in Taekwondo program has higher score in flexibility than non-participant group in Taekwondo program

4) The Level of Awareness of Obesity

[Table 6] shows you the mean and standard deviation of obesity by measured time point period and group. The participant group in Taekwondo program showed increase at all of 3 measured time points (1st (2.77), 2nd (2.94), and 3rd (3.18)) and also the non-participant group in Taekwondo program showed increase in all of 3 points (1st (3.13), 2nd (3.27), and 3rd (3.31)). The two-way ANOV Aanalysis is using descriptive statistics shows the followings.

Table 6. Obesity

| | Participants | | Non-participants | |
|-----------------|--------------|-----|------------------|-----|
| | M | SD | M | SD |
| 1 st | 2.77 | .92 | 3.13 | .74 |
| 2 nd | 2.94 | .98 | 3.27 | .75 |
| 3 rd | 3.18 | .86 | 3.31 | .74 |

The interaction effect between groups and time points measured on obesity factor turned out ineffective. Next, main effect analysis was carried out for the measured time periods and the results showed statistical significance by the point ($F(2, 102) = 4.668(p < .05)$).

And the results of the paired test of between-subjects turned out $F(1, 51) = 1.82(p > .05)$, which told that the means of obesity were not statistically significant. [Table 6] shows that there is difference in the groups by the measured time point.

Paired t-test was carried out to know the difference by the point. The participants in Taekwondo program showed statistical difference in the 1st and 3rd

measured point ($t_{21}=-2.446, p<.05$) while the non-participants in Taekwondo program showed no statistical difference in all of three time points.

5) The Level of Awareness of Physical Strength

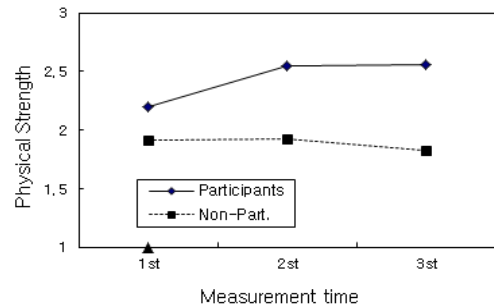
[Table 7] shows you the mean and standard deviation of physical strength by measured time point period and group. The participant group in Taekwondo program showed increase at all of 3 measured time points (1st (2.20), 2nd (2.55), and 3rd (2.56)) while the non-participant group in Taekwondo program showed almost no changes in 1st (1.91) and 2nd (1.92) and even decrease in 3rd time point (1.84). The two-way ANOV Aanalysis using descriptive statistics shows the followings.

Table 7. Physical Strength

| | Participants | | Non-participants | |
|-----------------|--------------|-----|------------------|-----|
| | M | SD | M | SD |
| 1 st | 2.20 | .54 | 1.91 | .68 |
| 2 nd | 2.55 | .85 | 1.92 | .64 |
| 3 rd | 2.56 | .67 | 1.84 | .63 |

Although the interaction effect between groups and time points measured on physical strength factor turned out statistically insignificant ($F(2, 104) = 2.933(p>.05)$), it appeared similar to that of standard value. On the basis of the result of interaction effect, main effect analysis was carried out for the measured time periods and the results didn't show statistical significance by the point ($F(2, 104) = 1.941(p>.05)$). However, the results of the paired test of between-subjects turned out $F(1, 52) = 12.974(p<.01)$, which suggested that the means of physical strength were statistically significant. [Table 7] shows that the participant groups in Taekwondo program had higher score in physical strength than non-participant group. Paired t-test was carried out to know the difference by the point. The result

showed that although there was no difference in the score of physical strength at the 1st measured time point ($t_{52}=1.669, p>.05$), there appeared statistically significant at the 2nd ($t_{53}=3.342, p<.01$) and 3rd ($t_{53}=4.250, p<.01$).



Next, to know the change of the trend by measured time point of physical strength, paired test between-subjects was carried out. It turned out a linear relationship $F(1, 52) = 4.606(p<.01)$, which was statistically significant. That is, [Fig. 2] shows that the participant group in Taekwondo program shows linearly increasing trend.

6) The Level of Awareness of Competence

[Table 8] shows you the mean and standard deviation of competence by measured time point period and group. The participant group in Taekwondo program showed increase of competence at all of 3 measured time points (1st (2.33), 2nd (2.58), and 3rd (2.85)) while the non-participant group in Taekwondo program showed the decrease in at all of 3 measured time points (1st (2.03), 2nd (1.85), and 3rd (1.84)). The two-way ANOVA Aanalysis using descriptive statistics shows the followings.

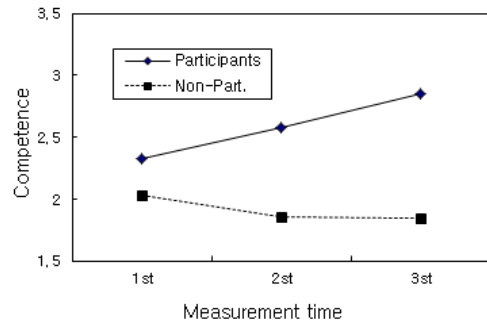
Table 8. Competence

| | Participants | | Non-participants | |
|-----|--------------|-----|------------------|-----|
| | M | SD | M | SD |
| 1st | 2.33 | .70 | 2.03 | .57 |
| 2nd | 2.58 | .80 | 1.85 | .64 |
| 3rd | 2.85 | .75 | 1.84 | .59 |

The interaction effect between groups and time points measured on competence seemed to exist ($F(2, 106) = 7.589 (p < .01)$). That is, the changing pattern of competence between two groups is different. As seen in [Table 8], the participant groups in Taekwondo program had higher score in competence than non-participant group.

Paired t-test was carried out to know the difference by the point. The result showed that although the participant groups in the program had statistically significant difference at the 1st and 3rd measured time point ($t_{22} = -3.737, p < .01$), non-participant group had no statistically significant difference at all of 3 measured time points. And independent t-Test was carried out on two groups by measured time point and the result showed that at the first point ($t_{53} = 1.718, p > .05$), there was no difference in the scores of competence between two groups in the 1st point ($t_{53} = 1.666, p > .05$) but at the second ($t_{52} = 3.728, p < .01$) and third point ($t_{53} = 5.553, p < .01$) there was statistically significant difference between groups.

Next, to know the change of the trend by measured time point of competence, paired test between-subjects was carried out. It turned out a linear relationship $F(1, 53) = 15.603 (p < .01)$ between the measured time points and two groups, which was statistically significant. That is, [Fig. 3] shows that the participant group in Taekwondo program shows linearly increasing trend while the non-participant group in Taekwondo program shows linearly decreasing trend.



7) The Level of Awareness of Confidence in Sports

[Table 9] shows you the mean and standard deviation of sports confidence by measured time point and group. The participant group in Taekwondo program showed increase sports confidence at all of 3 measured time points (1st (2.86), 2nd (3.07), and 3rd (3.17)) while the non-participant group in Taekwondo program showed the gradual decrease at all of 3 measured time points (1st (2.65), 2nd (2.59), and 3rd (2.51)).

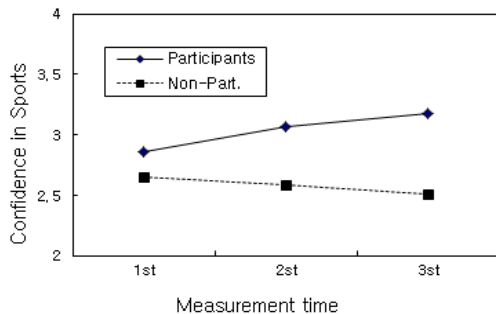
The interaction effect between groups and time points measured on sports confidence turned out existing $F(2, 106) = 3.256 (p < .05)$. That suggested that two groups had different changing pattern on sports confidence. In other words, as seen in [Fig. 9], the scores of sports confidence of the participant group showed gradual increase while non-participant group had the gradually decreasing scores.

Table 9. Confidence in Sports

| | Participants | | Non-participants | |
|-----------------|--------------|-----|------------------|-----|
| | M | SD | M | SD |
| 1 st | 2.86 | .75 | 2.65 | .56 |
| 2 nd | 3.07 | .68 | 2.59 | .73 |
| 3 rd | 3.17 | .79 | 2.51 | .80 |

Paired t-Test was carried out to know the difference more in detail by measured time point. The

result showed that the participant group in Taekwondo program had statistically significant difference between 1st and 2nd point ($t_{22}=-2.113, p<.05$) and between 1st and 3rd ($t_{22}=-2.563, p<.05$) while the non-participant group in Taekwondo program didn't show any significant difference at all of 3 measured time points. Also, independent t-Test showed that there was no difference in the score at the 1st measured point ($t_{53}=1.188, p>.05$) between groups but at the second ($t_{53}=2.475, p<.05$) and third period ($t_{53}=3.048, p<.01$), two groups showed statistically significant difference between groups.



Next, to know the change of the trend by measured time point of sports confidence, paired test between-subjects was carried out. It turned out a linear relationship $F(1, 53) = 15.603 (p < .01)$ between the measured time points and two group (AxB) s, which was statistically significant. That is, [Fig. 4] shows that the participant group in Taekwondo program shows linearly increasing trend while the non-participant group in Taekwondo program shows linearly decreasing trend.

IV. Discussion and Conclusion

1. Discussion

In this study, self-concept is defined as individual

opinion upon oneself. This concept can be divided into some sub categories such as academic, social, emotional and physical self-concept. Among them, physical self-concept consists of endurance, diseases, flexibility, obesity, muscular strength, competence confidence in sports and physical strength.

According to the results of main effect analysis upon the factors that didn't show interaction effect, difference was found in leaving person out among the measured time point, and in flexibility and physical strength between the groups. Here the participant group in Taekwondo program had higher scores in physical self-concept as a whole than non-participant group. In particular, a statistically significant difference was absorbed between the groups in flexibility. Although such difference wasn't seen in the first measurement but in the second measurement, the participant group in Taekwondo program had higher scores by .42 than non-participant group. Also in physical strength, difference wasn't seen in the first measurement but, in the second measurement, the participant group in Taekwondo program had higher scores by .63 than non-participant group and by .72 in the third measurement.

In summary, there was a difference in physical self-concept between the participant and non-participant group in youth Taekwondo training. The following shows the comparison between these findings in this study and the precedent studies.

Sonstroem & Morgan[29] suggested that cognitive ability of sports and athletic experiences has impact on ego formation and Maehr et al.[25] reported that there is a positive relationship between demonstrated physical performance and self-concept. In domestic academia, Park and Lee [8] wrote that Taekukkwon training improves the level of self-concept and self-respect. Also Kim Sang Kuk et al.[2] the

participation in physical education program for children has a positive impact on the development of physical self-concept and Kim(6) demonstrated that lightly handicapped children's physical competence has a positive relationship with their motional performance

In the meantime, Kang & Park[1], in relation with Taekwondo, said that Taekwondo training has an impact on physical self-concept and Song & Lee[10] reported that children who had Taekwondo training have higher level of moral ego and personal ego. The previous studies have much in common with and support the results of this study. Putting all of these together, we can see that Taekwondo training has a positive impact on physical self-concept and more than anything else the different changing pattern of physical self-concept between Taekwondo participants and non-participants.

Besides the previous findings explained above, the precedent studies, both domestically and internationally, which are involved with martial arts, report that martial art training has physical and emotional effect. That is, it is effective for endurance, flexibility, muscular power, coordination[23] in terms of physical effects. Also as emotional effects there are good for self-esteem[27] and control[24]. Those effects are similar to the cores of physical self-concept, supporting the findings of this study.

However, Focht et al.[20] asserted that martial art training program doesn't bring in any difference in physical self-competence and Lee, Um, Cho[12] demonstrated that 12 week-long program consisting of weight training, tennis, swimming, and badminton didn't create any difference in physical self-concept. And Asci, Kin, & Kosar[16] maintained that the participation in 8 week-long aerobic dancing program didn't produce any difference in physical self-concept and the reason was that the frequency of participation

in the program was too low or too short. In addition, Asci et al.[16] said it was because of the types of the sports program and research methodology. In consideration of these results of the precedent studies, Taekwondo is a sport program that can have impact on physical self-concept and the effect can be exerted when the participatory frequency is over 5 times a week or/and 6 hours. Furthermore, more specific effect can begin to be expressed from 24th week from 12th week.

When we interpret these findings from the viewpoint of development and change, the value is greater. Park & Mun[9] examined that there were differences in body fat, appearance, and self-respect by grade and 3rd graders were more aware than the 1st or 2nd graders. And Cole et al.[19] and Marsh et al.[26] sociability and sport awareness among youth self-concept are linearly growing as age is added. In other words, that the participant and non-participant groups have different development pattern allows us to assume that Taekwondo training is the more stiff linear change pattern for youth physical self-concept.

2. Conclusion

On the basis of the results and discussions we executed so far, we reach to the following conclusions.

First, there was a general difference in the changing pattern of physical self-concept between the participant and non-participant groups in Taekwondo program by measured time point. That is, there are detailed differences in the patterns of endurance, competence, and sport confidence in physical self-concept.

Second, there was a general difference in the measured scores of physical self-concept between the participant and non-participant groups in Taekwondo program. That is, more participated Taekwondo

training is, the higher the measured scores are: the 1st score < the 2nd score or the 1st score < the 3rd score.

Third, there was a general difference in the scores of physical self-concept between the 2nd and 3rd measure. That is, there is not difference in score at the first measured time point between two groups but is a difference between two groups at the second and third measurement.

In conclusion, Taekwondo training has an effect on the change of youth physical self-concept.

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